AGENDA
IRVINE RANCH WATER DISTRICT
ENGINEERING AND OPERATIONS COMMITTEE
TUESDAY, JULY 17, 2018

CALL TO ORDER 7:30 a.m., IRWD's Operations Center, First Floor Committee Room
3512 Michelson Drive, Irvine, California 92612

ATTENDANCE Committee Chair: John Withers _____
Committee Member: Mary Aileen Matheis _____

ALSO PRESENT

Paul Cook	_____	Jose Zepeda	_____	Harry Cho	_____
Kevin Burton	_____	Eric Akiyoshi	_____	Paul Weghorst	_____
Rich Mori	_____	Scott Toland	_____	Tom Roberts	_____
Kelly Lew	_____	Ken Drake	_____	Ken Pfister	_____
Lars Oldewage	_____	Arseny Kalinsky	_____	Steve Malloy	_____
Malcolm Cortez	_____	Barkev Meserlian	_____	_____	_____
John Dayer	_____	Bruce Newell	_____	_____	_____

COMMUNICATIONS

1. Notes: Burton
2. Public Comments
3. Determine the need to discuss and/or take action on item(s) introduced that came to the attention of the District subsequent to the agenda being posted.
4. Determine which items may be approved without discussion.

INFORMATION

5. SAN JOAQUIN MARSH RESEARCH PROJECTS – SWIFT/ZEPEDA

   Recommendation: Receive and file.

ACTION

6. IRVINE LAKE PIPELINE NORTH CONVERSION OFFSITE PIPELINES CONTRACT CHANGE ORDER – MCGEHEE/MORI/BURTON

   Recommendation: That the Board approve Contract Change Order No. 7 with CCL Contracting, Inc. in the amount of $110,068.17 for additional construction work for the Irvine Lake Pipeline North Conversion Offsite Pipelines, Project 05823.

ACTION (Continued)

7. IRVINE LAKE PIPELINE NORTH CONVERSION RESERVOIR VARIANCE – MOEDER/MORI/BURTON

   Recommendation: That the Board authorize the General Manager to execute Variance No. 3 in the amount of $64,491 with Kleinfelder for additional engineering services during construction for the Irvine Lake Pipeline North Conversion Reservoir, Project 05407.

8. SEWAGE TREATMENT MASTER PLAN BUDGET INCREASE AND CONSULTANT SELECTION – MOEDER/MORI/BURTON

   Recommendation: That the Board approve a budget increase in the amount of $209,000, from $921,300 to $1,130,300, for Project 05427 and in the amount of $104,500, from $454,300 to $558,800, for Project 07141, and authorize the General Manager to execute a Professional Services Agreement with HDR in the amount of $1,070,600 for engineering services for the Sewage Treatment Master Plan, Projects 05427 and 07141.

9. REHABILITATION OF DYER ROAD WELLFIELD WELLS 10 AND 16 CONSULTANT SELECTION – SPANGENBERG/CORTEZ/BURTON

   Recommendation: That the Board authorize the General Manager to execute a Professional Services Agreement with Richard C. Slade Associates LLC in the amount of $249,391 for rehabilitation of Dyer Road Wellfield Wells 10 and 16, Projects 07087 and 07091, and two additional wells to be selected at a later date.

10. REIMBURSEMENT AGREEMENTS BETWEEN IRWD AND THE CITY OF IRVINE FOR THE ANNUAL SLURRY SEAL AND PAVEMENT REHABILITATION PROJECT AND THE CULVER DRIVE AND UNIVERSITY DRIVE INTERSECTION IMPROVEMENTS – KESSLER/LEW/BURTON

    Recommendation: That the Board authorize the General Manager to execute Reimbursement Agreements with the City of Irvine for the Annual Slurry Seal and Pavement Rehabilitation project and the Culver Drive and University Drive Intersection Improvements project.

11. TURTLE RIDGE PIPELINES CATHODIC PROTECTION CONSULTANT SELECTION – SMYTH/CORTEZ/BURTON

    Recommendation: That the Board authorize the General Manager to execute a Professional Services Agreement with V&A Engineering in the amount of $138,909 for the Turtle Ridge Pipelines Cathodic Protection, Projects 07888 and 07889.

OTHER BUSINESS

12. Directors' Comments

13. Adjourn

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Availability of agenda materials: Agenda exhibits and other writings that are disclosable public records distributed to all or a majority of the members of the above-named Committee in connection with a matter subject to discussion or consideration at an open meeting of the Committee are available for public inspection in the District's office, 15600 Sand Canyon Avenue, Irvine, California ("District Office"). If such writings are distributed to members of the Committee less than 72 hours prior to the meeting, they will be available from the District Secretary of the District Office at the same time as they are distributed to Committee Members, except that if such writings are distributed one hour prior to, or during, the meeting, they will be available at the entrance of the meeting room at the District's Operations Committee Room at 3512 Michelson, Irvine, California. The Irvine Ranch Water District's Committee Room is wheelchair accessible. If you require any special disability-related accommodations (e.g., access to an amplified sound system, etc.), please contact the District Secretary at (949) 453-5312 during business hours at least seventy-two (72) hours prior to the scheduled meeting.

July 17, 2018
Prepared by: I. Swift
Submitted by: J. Zepeda
Approved by: Paul A. Cook

ENGINEERING AND OPERATIONS COMMITTEE

SAN JOAQUIN MARSH RESEARCH PROJECTS

SUMMARY:

District staff have been voluntarily collecting and analyzing water quality and ecological performance data from the San Joaquin Marsh over the past year and have presented the results of these studies at the national meeting of the Society of Wetland Scientists. Long-term analysis of selenium data from the Marsh show that overall selenium and selenate decrease and the more harmful selenite does not statistically increase, demonstrating that the Marsh does not increase or sequester selenium, as has been asserted. In a second study comparing macroinvertebrate community structure between the Marsh's inlet and outlet, staff found pollution tolerance values decreased, abundance increased, and taxa richness decreased.

BACKGROUND:

Marsh Selenium Study, by S. Parsons

Selenium is a naturally occurring element that, in elevated concentrations, can pose reproductive and developmental risks to birds and fish in aquatic ecosystems. When dissolved oxygen is low in aquatic systems, selenium remains in its elemental form. In oxygenated aquatic zones elemental selenium can be oxidized to other forms, including selenate and selenite. These forms are more bioavailable (i.e., can accumulate in the bodies of birds and fish) than elemental selenium, and selenite is the more toxic of these forms.

Prior to the 20th century, the so-called "Swamp of the Frogs" covered a large portion of central Orange County in the Irvine-Tustin area. Selenium-rich water pooled in this large wetland with low oxygen concentrations, thus selenium remained in its less toxic form. Drainage and channelization of the "Swamp" led to increased oxygen concentrations and mobilization of more toxic forms of selenium. When the San Joaquin Marsh was constructed in 1998, concerns were raised about the potential for the marsh to sequester selenium in sediment and plant and animal tissues. In addition, oxidation of selenium could further increase levels of more toxic forms such as selenite. Concerns were raised further in 2008 when the Santa Ana Regional Water Quality Control Board (RWQCB) proposed a Total Maximum Daily Load (TMDL) for selenium in San Diego Creek, specifically stating "toxic substances shall not be discharged at levels that will bioaccumulate in aquatic resources to levels which are harmful to human health, and the concentrations of toxic pollutants in the water column, sediments or biota shall not adversely affect beneficial uses" (Resolution No. R8-2017-0014). In 2017, the TMDL was promulgated by RWQCB using the California Toxics Rule for the water column in combination with a tissue-based standard.

Since 2009, selenium data have been voluntarily collected throughout the San Joaquin Marsh by District staff. Water samples were taken monthly at seven locations within the flow path from influent to effluent of the Marsh, and analyzed for total selenium, selenate, and selenite by the

District's Water Quality Lab. Samples collected within seven days after a rain event were excluded from analysis in order to focus on dry weather selenium concentrations rather than storm events that can skew data. Data from 2009 to 2016 were analyzed to identify overall trends in selenium speciation throughout the Marsh.

During the 2009-2016 monitoring period, there was a mean total selenium reduction from 25.64 µg/L to 16.33 µg /L, a decrease in selenate from 17.34 µg /L to 5.14 µg /L, and a slight increase in selenite from 4.24 µg /L to 4.94 µg /L from influent to effluent. The changes in total selenium and selenate were statistically significant, while the change in selenite was not significant. These data indicate that the San Joaquin Marsh reduces selenium levels without significantly increasing more toxic and bioavailable selenium species. The Marsh is able to reduce selenium via biogeochemical processes such as sedimentation and volatilization which remove selenium from the water column. Selenium removal via the Marsh significantly improves water quality in San Diego Creek and Newport Bay, without inherently increasing toxicity.

Marsh Macroinvertebrate Study, by I. Swift

Constructed treatment wetlands have been recognized as an effective and low-cost strategy for treating urban runoff. The extent to which a treatment wetland reaches the desired results can be assessed by measuring water quality parameters such as dissolved oxygen, pH, dissolved particulates, nutrients, etc., but additional measures such as composition of biotic communities can provide a more holistic perspective. One biotic community commonly used to assess habitat quality are macroinvertebrates, which are animals lacking backbones that are larger than 500 µm. Macroinvertebrates respond to changes in water chemistry and are ecologically important as the base of the wetland food web, making them useful indicators of water quality.

District staff examined macroinvertebrate community characteristics between the inlet (Pond A) and outlet (Pond 6) of the San Joaquin Marsh. The objective was to investigate if the outlet macroinvertebrate community differed from the inlet macroinvertebrate community. Staff hypothesized that macroinvertebrate community differences would reflect improving water quality parameters from the inlet to the outlet.

Macroinvertebrates were collected using both active and passive sampling methods. Active sampling was conducted using a 500 µm mesh D-frame net, and passive sampling was conducted using Hester-Dendy colonization plates. Active samples consisted of three 1-minute sweeps adjacent to or within the dominant habitat types determined upon initial surveying of the site. Passive samples consisted of four HD samplers attached to a cinderblock and placed within the dominant habitat types. Three cinderblocks were deployed at each inlet and outlet and retrieved after 4-8 weeks. Invertebrates were then sorted and identified to the lowest taxonomic level possible in the lab.

Community composition was different between the inlet and the outlet, with the inlet dominated by aquatic worms (oligochaetes) (55%) and the outlet dominated by midges (chironomids) (82.8%). The outlet macroinvertebrate community had a lower average tolerance value (TV) than that of the inlet, as would be expected with improving water quality. TVs were driven by the dominance of aquatic worms (TV = 8) in the inlet and midges (TV = 6) in the outlet. No taxa

highly intolerant of pollution (TV= 0-2, on a scale of 0-10) were found in either pond. This is not surprising given constructed treatment wetlands have higher proportions of more pollution tolerant taxa. There was no significant difference in abundance between the inlet and the outlet. 15 total taxa were collected in the SJM; 14 taxa in the inlet, and 12 taxa in the outlet.

Taxa richness was lower at the outlet, which is contrary to expectations given many improving water quality parameters compared to the inlet. Two water quality parameters which did not improve however, were dissolved oxygen and total suspended solids, which are important predictors of invertebrate taxa richness. Lower dissolved oxygen and higher suspended solids are the result of algal growth and decay which facilitate nutrient uptake and removal, a key function of the SJM. Staff manage the SJM to balance nutrient removal, physical water quality parameters, and ecological components such as macroinvertebrates. A similar study comparing the macroinvertebrate community of the inlets and outlets of five NTS sites is currently underway.

FISCAL IMPACTS:

None.

ENVIRONMENTAL COMPLIANCE:

None.

RECOMMENDATION:

Receive and file.

LIST OF EXHIBITS:

Exhibit "A" – Selenium Removal within the San Joaquin Marsh
Exhibit "B" – Macroinvertebrate Response to Water Quality in the San Joaquin Marsh

EXHIBIT "A"

Selenium Removal within the San Joaquin Marsh

Sheryl Parsons
Sr. Wetlands Specialist, Natural Treatment Systems

July 17, 2018

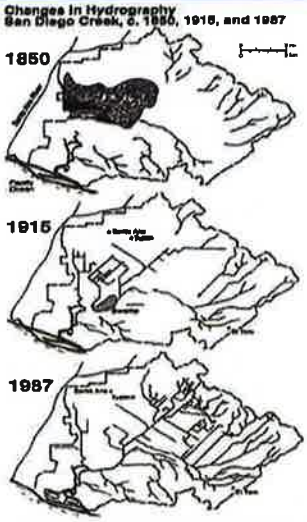
Selenium

Selenium Species	Bioavailability	Toxicity
Elemental Selenium	Low	Low
Selenate	High	Low
Selenite	**High**	**High**

Irvine Ranch WATER DISTRICT

Selenium Timeline in Orange County

- Pre-1900s: "Swamp of the Frogs"
- 1915: "Swamp" drained and channelized
- 1998: Construction of San Joaquin Marsh
- 2008: Selenium TMDL proposed



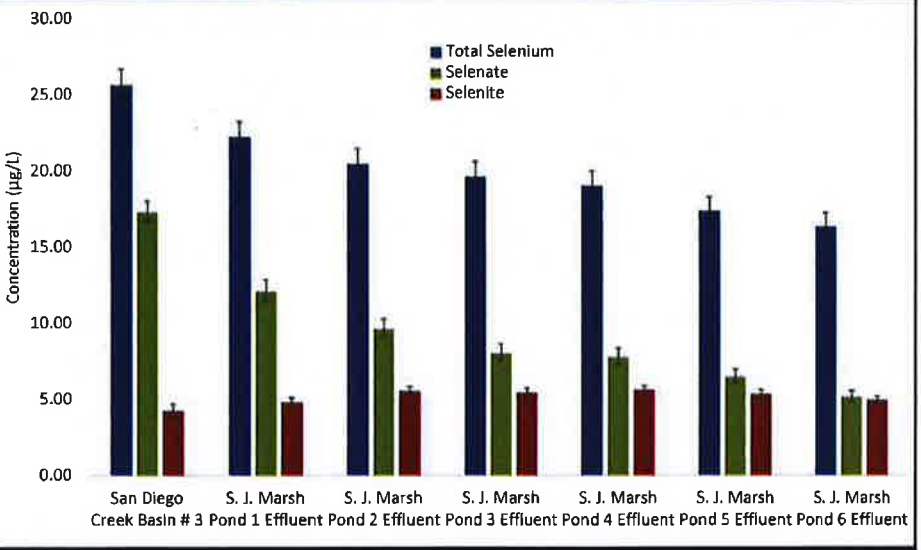
Irvine Ranch Water District

Selenium Sampling Locations

Irvine Ranch Water District

Irvine Ranch WATER DISTRICT

Selenium Species 2009-2016



Conclusions

- SJM reduces selenium levels without significantly increasing more toxic and bioavailable selenium species.
- Selenium removal significantly improves water quality in San Diego Creek and Newport Bay.

Irvine Ranch WATER DISTRICT

EXHIBIT "B"

Macroinvertebrate Response to Water Quality in the San Joaquin Marsh

Ian Swift
Natural Resources Manager

July 17, 2018

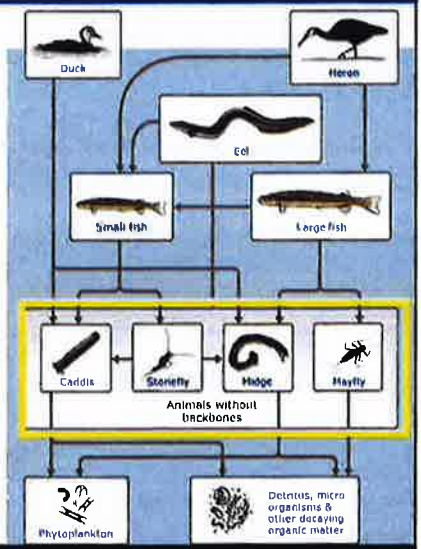
Macroinvertebrates as Water Quality Indicators

What are macroinvertebrates?

- Animals without backbones over 500 µm

Why are they useful indicators?

- Respond to impairment
- Important to the wetland food web
- More holistic measure of water/wetland habitat quality
- Required by NTS Master Plan to assess macroinvertebrates



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Purpose

- Is there a response of MI communities to improving water quality at SJM?
- Does SJM **outlet (Pond 6) MI community** look different from **inlet (Pond A) MI community**?

Irvine Ranch Water District

Methods

PASSIVE

- 4 Hester Dendy samplers fastened to cinderblock using wire
  - 3 blocks per inlet/outlet
- Samplers placed near main habitat types and deployed for 4 – 8 weeks
- Samples preserved in ethanol

ACTIVE

- 1-minute sweeps using D-frame net
  - 3 sweeps per inlet/outlet
- Target main habitat types (e.g., rocks, soft sediment, vegetation)
- Samples preserved in ethanol

- Macroinvertebrates identified to lowest taxonomic level possible and quantified

Irvine Ranch Water District

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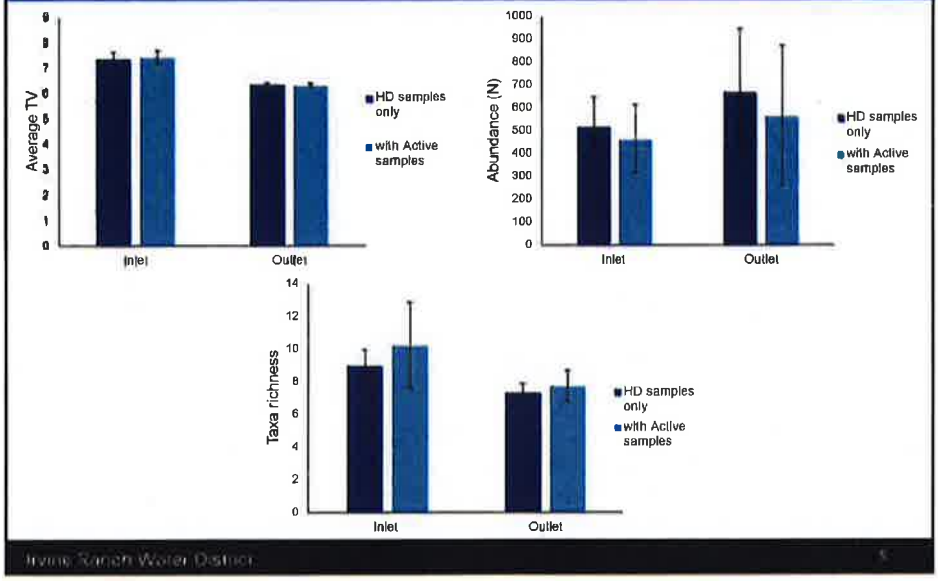
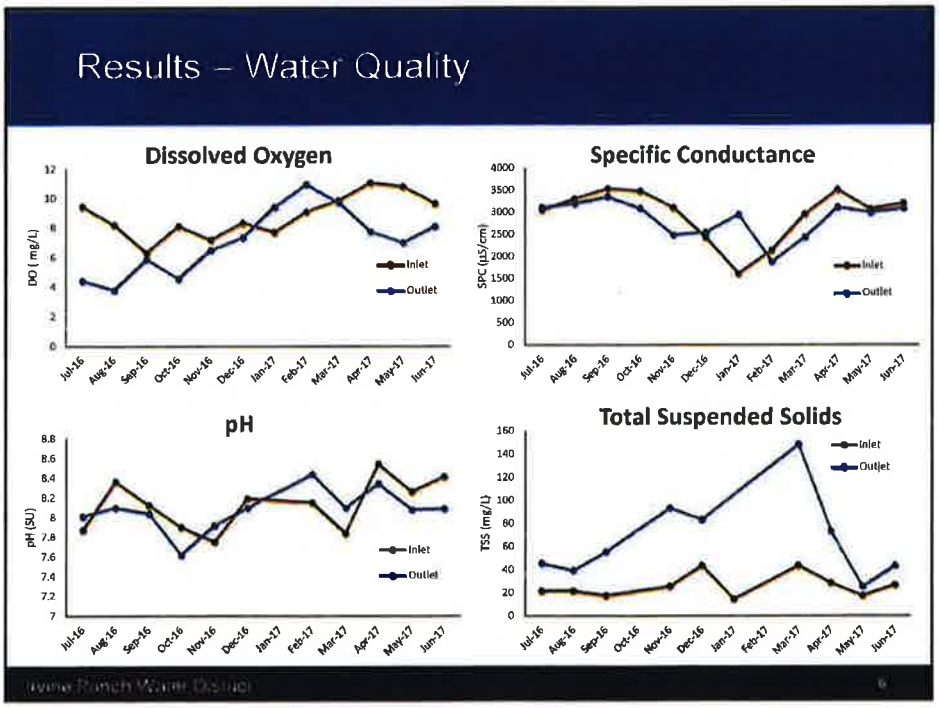
Results – Invertebrate Community



Results – Water Quality



Conclusions

- Low DO and high TSS are the result of algal growth and decay which facilitate nutrient uptake and removal
- SJM is managed to balance nutrient removal, physical water quality parameters, and ecological components
- Continuing Work: 2018 study – comparing MI community and water quality parameters at five additional NTS sites

Irvine Ranch WATER DISTRICT

July 17, 2018
Prepared by: J. McGehee/R. Mori
Submitted by: K. Burton
Approved by: Paul A. Cook

ENGINEERING AND OPERATIONS COMMITTEE

IRVINE LAKE PIPELINE NORTH CONVERSION OFFSITE PIPELINES
CONTRACT CHANGE ORDER

SUMMARY:

CCL Contracting, Inc. is constructing the Irvine Lake Pipeline (ILP) North Conversion Offsite Pipelines project, which is approximately 80% complete. Staff recommends that the Board approve Contract Change Order (CCO) No. 7 in the amount of $110,068.17 for additional construction work caused by previously unknown adverse soil conditions in Santiago Canyon Road.

BACKGROUND:

IRWD is converting a significant portion of the ILP from untreated water to recycled water. The overall conversion project includes construction of a 2.4 million gallon buried prestressed concrete reservoir, associated improvements at the Rattlesnake Reservoir Complex, and the offsite pipelines necessary to connect the new reservoir to both the untreated and recycled water distribution systems. The scope of this project is the offsite pipelines portion of the overall project. Construction of the offsite pipelines began in September 2017 and is estimated for completion in August 2018.

During construction of the 42-inch ILP in Santiago Canyon Road, CCL encountered poor and unstable soil conditions that led to extensive caving of the walls of the pipeline trench. NMG Geotechnical reviewed the field conditions and determined that the trench paralleled an unmapped inactive fault consisting of two different soil types. As CCL excavated for the pipe trench, unstable soils on both sides of the inactive fault were exposed resulting in caving of the pipeline trench walls. Since the ILP alignment is near the middle of Santiago Canyon Road with vehicular travel lanes located on both sides of the trench, CCL determined that further trenching would require beam and plate shoring in lieu of the hydraulic speed shoring that was used to construct previous portions of the pipeline.

Since the inactive fault and associated adverse soil conditions were not identified in the geotechnical report, staff approved CCO No. 4 in the amount of $77,155.83 for the beam and plate shoring system that would be required to construct approximately 320 feet of the 42-inch ILP. After execution of the change order, CCL began working with a shoring designer to develop the beam and plate shoring system. Through this process, CCL determined that beam and plate shoring would add substantial time to the construction period so it ultimately elected to proceed with the remainder of the pipeline construction, at its risk, using an alternative shoring method consisting of a custom 32-foot long trench shoring box. Use of the trench shoring box was successful and resulted in a credit of $6,946.83 to the previously approved CCO No.4 for beam and plate shoring.

CCO No. 7:

To prepare for construction of the 42-inch Zone C+ pipeline also located in Santiago Canyon Road, CCL performed potholing to identify if similar soil conditions would be encountered on the Zone C+ pipeline since it is parallel to, and approximately 35 feet away from, the 42-inch ILP. Potholing confirmed that an approximately 360-foot long portion of the Zone C+ pipeline was also routed through similar adverse soil conditions as encountered during construction of the 42-inch ILP. Similar to the construction of the ILP, CCL elected to proceed with construction in the adverse soil areas using the same custom 32-foot long trench shoring box. For the Zone C+ pipeline, the effort required to construct the pipeline through this area was magnified because the C+ pipeline is approximately eight feet deeper than the ILP. The increased depth resulted in slower production and additional effort by CCL to stabilize the pipe trench. Nonetheless, CCL successfully completed construction of the Zone C+ pipeline through this challenging area.

CCL submitted CCO No. 7 in the amount of $110,068.17 for the additional work associated with constructing approximately 360 feet of the Zone C+ pipeline using an alternative shoring system. The change order, provided as Exhibit "A", includes the $6,946.83 credit for the 42-inch ILP discussed above. Staff reviewed the change order and recommends approval of CCO No. 7 in the amount of $110,068.17. A summary of change orders to date is provided as Exhibit "B".

FISCAL IMPACTS:

The ILP North Conversion Offsite Pipelines, Project 05823, is included in the FY 2018-19 Capital Budget. The existing budget is sufficient to fund the recommendation presented herein.

The project is receiving grant funding from the Bureau of Reclamation and the State Water Resources Control Board. The Bureau of Reclamation funding in the amount of $300,000 is being provided through the Drought Resiliency Grant program with 75 percent IRWD matching requirements. The State Board is providing Proposition 1 Recycled Water Program grand funds, which will contribute up to a 35 percent match on eligible construction costs up to a maximum of $29,510,300 in project costs.

ENVIRONMENTAL COMPLIANCE:

This project is subject to the California Environmental Quality Act (CEQA) and in conformance with California Code of Regulations Title 14, Chapter 3, Article 6, a Notice of Intent to adopt a Mitigated Negative Declaration was filed with the County of Orange on November 3, 2015. Pursuant to State Guideline § 15073, the Initial Study/Mitigated Negative Declaration (IS/MND) was made available for public review for a period of 30 days from November 4, 2015 through December 3, 2015. The IS/MND was adopted by IRWD Board of Directors at its January 11, 2016 meeting. A Notice of Determination was filed with the Orange County Clerk/Recorder and the CA State Clearinghouse on January 12, 2016.

RECOMMENDATION:

That the Board approve Contract Change Order No. 7 with CCL Contracting, Inc. in the amount of $110,068.17 for additional construction work for the Irvine Lake Pipeline North Conversion Offsite Pipelines, Project 05823.

LIST OF EXHIBITS:

Exhibit "A" – Contract Change Order No. 7
Exhibit "B" – Contract Change Order Summary Log

EXHIBIT "A"

CONTRACT CHANGE ORDER

IRVINE RANCH WATER DISTRICT
15600 Sand Canyon Avenue
P. O. Box 57000
Irvine, California 92619-7000
(949) 453-5300

C.O. No. 7
☐ Final

Project No. 05823

Offsite Pipelines for the ILP North Conversion Project
Project Title

Date: 6/25/2018

THE FOLLOWING CHANGE TO CONTRACT, DRAWINGS AND SPECIFICATIONS IS PROPOSED.	$ ADDITIONS	$ DELETIONS	DAYS ±
1. Change Request 23			
Extra work on C+ pipeline alignment in Santiago Canyon Road due to adverse soil conditions	117,015.00	0.00	0
Credit for alternative shoring system in lieu of beam and plate shoring approved as part of Change Order No. 4	0.00	6,946.83	0
Contract Completion Date: September 19, 2018			
TOTAL	117,015.00	6,946.83	0

			DAYS ±
1. NET AMOUNT THIS CHANGE ORDER	=	110,068.17	0
2. ORIGINAL CONTRACT AMOUNT	=	8,337,193.50	400
3. TOTAL PREVIOUS CHANGE ORDER(S)	=	171,720.21	0
4. TOTAL BEFORE THIS CHANGE ORDER (2+ 3)	=	8,508,913.71	400
5. PROPOSED REVISED CONTRACT AMOUNT TO DATE (1+4)	=	8,618,981.88	400

We hereby agree to make the above change subject to the terms of this change order for the sum of:

One Hundred Ten Thousand Sixty Eight and 17/100 - Dollars

6-25-18 — Date
CCL Contracting, Inc. — Contractor
By: [signature]

SIGNATURE	DATE	APPROVAL LEVEL REQUIRED	
[signature] IRWD Engineer or Consulting Engineer	6/25/18 Date	Department Director Approval Required	☐
[signature] Principal Engineer	06/27/18 Date	Executive Director Approval Required	☐
[signature] Executive Director of Engineering & Water Quality	6/27/18 Date	General Manager Approval Required	☐
General Manager	Date	Board Approval Required	X
		By Date	
		603290 Purchase Order No.	

NOTE: The documents supporting this Change Order, including any drawings and estimates of cost, if required are attached hereto and made a part hereof. This Change Order shall not be considered as such until it has been signed by the Owner and the Contractor. Upon final approval, distribution of copies will be made as required. The parties mutually agree the pricing set forth in this Change Order are complete and fair compensation for the entirety of the work authorized under this Change Order and that no additional compensation is warranted nor shall it be allowed.

CHANGES: All workmanship and materials called for by this Order shall be fully in accord with the original Contract Documents insofar as the same may be applied without conflict to the conditions set forth by this Order. The time for completing the contract will not be extended unless expressly provided for in this Change Order.

EXHIBIT "B"

Offsite Pipelines for the ILP North Conversion Project
PR 05823
Construction Change Order Summary

Contractor: CCL Contracting, Inc.
Design Engineer: MBI
Award Date: 8/15/2017

		Contract Amount						Contract Days				Original Completion Date:
					Original Contract Amount:		$8,337,193.50			Original Days:	400	9/19/2018
Change Order	Description	Change Order Line Item Amount	Change Order Amount	Previous Change Orders	Cumulative Total of Change Orders	% of Original Contract Amount	Revised Contract Amount	Change Order Days	Previous Change Orders	Cum. Total C.O. days	Revised Total Contract Days	Revised Completion Date
1	Approved by Executive Director Approved on 12/11/2017		$12,810.00	$0.00	$12,810.00	0.15%	$8,350,003.50	0	0	0	400	9/19/2018
	CR No. 1 - 20" PVC pipeline changes	$ 12,810.00						0				
2	Approved by Executive Director Approved on 2/28/2018		$42,555.56	$12,810.00	$55,365.56	0.66%	$8,392,559.06	0	0	0	400	9/19/2018
	CR No. 2 - Addition of warf head hydrant	$ 12,594.05						0				
	CR No. 5 - Unknown utility crossing (20" PVC pipeline)	$ 1,032.48						0				
	CR No. 6 - Unknown utility crossing (42" WSP)	$ 9,189.21						0				
	CR No. 7 - Pipeline elevation changes due to utility crossing	$ 16,102.00						0				
	CR No. 9 - ILP Connection No. 2 changes	$ 3,637.82						0				
3	Approved by Executive Director Approved on 2/28/2018		$ (44,574.31)	$55,365.56	$10,791.25	0.13%	$8,347,984.75	0	0	0	400	9/19/2018
	CR No. 3 - Deletion of insulating flange kits	$ (9,599.31)						0				
	CR No. 4 - Blow off assembly location adjustments	$ (34,975.00)						0				
4	Approved by General Manager Approved on 3/28/2018		$95,073.24	$10,791.25	$105,864.49	1.27%	$8,443,057.99	0	0	0	400	9/19/2018
	CR No. 10 - Beam and plate shoring for ILP in SCR	$ 77,155.83						0				
	CR No. 11 - Extra work tickets for unknown conditions	$ 17,917.41						0				
5	Approved by Executive Director Approved on 4/24/18		$39,736.67	$105,864.49	$145,601.16	1.75%	$8,482,794.66	0	0	0	400	9/19/2018
	CR No. 13 - Traffic sign updates	$ 738.51						0				
	CR No. 16 - Pipeline realignment at Canyon View	$ 24,174.16						0				
	CR No. 17 - Steel elbow at reservoir site connection	$ 5,143.12						0				
	CR No. 18 - Deeper excavation per Delta 3 plan	$ 8,439.00						0				
	CR No. 19 - Add'l 54-inch loose flange	$ 1,241.88						0				
6	Approved by General Manager Approved on		$26,119.05	$145,601.16	$171,720.21	2.06%	$8,508,913.71	0	0	0	400	9/19/2018
	CR No. 8 - Unsuitable backfill material	$ 7,251.39						0				
	CR No. 14 - Unsuitable backfill material	$ 3,035.28						0				
	CR No. 15 - Unsuitable backfill material	$ 4,741.29						0				
	CR No. 20 - Sampling Station	$ 5,300.00						0				
	CR No. 21 - Extra Paving	$ 13,782.18						0				
	CR No. 22 - Piping Modifications (Mark 5)	$ 13,642.98						0				
	CR No. 24 - Piping Modifications (Mark 7)	$ 9,324.28						0				
	CR No. 25 - Reservoir Area Backfill and Piping	$ (20,777.73)						0				
	CR No. 26 - Bottom Drain Relocation	$ (15,323.74)						0				
	CR No. 27 - Concrete Pad Adjustments	$ 5,143.12						0				

Offsite Pipelines for the ILP North Conversion Project
PR 05823
Construction Change Order Summary

Contractor: CCL Contracting, Inc.
Design Engineer: MBI
Award Date: 8/15/2017

		Contract Amount						Contract Days				Original Completion Date:
					Original Contract Amount:		$8,337,193.50			Original Days:	400	9/19/2018
Change Order	Description	Change Order Line Item Amount	Change Order Amount	Previous Change Orders	Cumulative Total of Change Orders	% of Original Contract Amount	Revised Contract Amount	Change Order Days	Previous Change Orders	Cum. Total C.O. days	Revised Total Contract Days	Revised Completion Date
7	Approved by Board of Directors Approved on CR No. 23 - Extra work on C+ pipeline alignment in Santiago Canyon Road due to adverse soil conditions and credit for alternative shoring performed in lieu of beam and plate shoring approved as part of Change Order No. 4	$ 110,068.17	$110,068.17	$171,720.21	$281,788.38	3.38%	$8,618,981.88	0 0	0	0	400	9/19/2018

TOTAL CHANGE ORDERS	281,788.38	3.38%
REVISED CONTRACT AMOUNT	8,618,981.88	

July 17, 2018
Prepared by: J. Moeder/R. Mori
Submitted by: K. Burton
Approved by: Paul A. Cook

ENGINEERING AND OPERATIONS COMMITTEE

IRVINE LAKE PIPELINE NORTH CONVERSION RESERVOIR VARIANCE

SUMMARY:

Construction of the Irvine Lake Pipeline (ILP) North Conversion Reservoir began in October 2016 and is approximately 60% complete. Staff recommends that the Board authorize the General Manager to execute Variance No. 3 in the amount of $64,491 with Kleinfelder for additional engineering services during construction for the ILP North Conversion Reservoir. The variance accounts for additional services not included in Kleinfelder's contract scope of work.

BACKGROUND:

As part of IRWD's strategic plan to increase recycled water usage and reduce reliance on imported water supplies, IRWD is converting a significant portion of the ILP from untreated water to recycled water. The project includes construction of a 2.4-million gallon buried prestressed concrete reservoir and associated improvements at the Rattlesnake Reservoir Complex and the Orchard Hills Strainer Facility. Construction of the project began in October 2016 and is approximately 60% complete. The project is scheduled for completion in February 2019.

Variance No. 3:

Construction of the reservoir, which originally included a 23-month construction duration, has experienced multiple issues that have delayed its completion. Issues that have impacted completion include a substantial redesign effort associated with the postponement of the Santiago Hills II development, additional design efforts and construction grading activities associated with unanticipated onsite soil and geologic conditions, and additional weather delays associated with the amount of time needed for the site to recover after rain events. These and other minor changes have resulted in the extension of the project schedule by an additional eight months. Kleinfelder's original scope of work and associated level of effort was based on the original 23-month construction duration, so additional budget is required to ensure Kleinfelder can continue supporting the project through its estimated completion in February 2019.

At staff's request, Kleinfelder submitted a variance in the amount of $64,491 for additional engineering services during construction. Included in the variance is effort for additional construction support, responses to contractor requests for information, submittal reviews, and site visits. Staff reviewed the variance, which is attached as Exhibit "A", and recommends approval of Variance No. 3 in the amount of $64,491with Kleinfelder.

FISCAL IMPACTS:

The Irvine Lake Pipeline North Conversion Reservoir, Project 05407, is included in the FY 2018-19 Capital Budget. The existing budget is sufficient to fund Variance No. 3 in the amount of $64,491.

The project is receiving grant funding from the Bureau of Reclamation and the State Water Resources Control Board. The Bureau of Reclamation funding in the amount of $300,000 is being provided through the Drought Resiliency Grant program with 75 percent IRWD matching requirements. The State Board is providing Proposition 1 Recycled Water Program grand funds, which will contribute up to a 35 percent match on eligible construction costs up to a maximum of $29,510,300 in project costs.

ENVIRONMENTAL COMPLIANCE:

This project is subject to the California Environmental Quality Act (CEQA) and in conformance with California Code of Regulations Title 14, Chapter 3, Article 6, a Notice of Intent to adopt a Mitigated Negative Declaration was filed with the County of Orange on November 3, 2015. Pursuant to State Guideline § 15073, the Initial Study/Mitigated Negative Declaration (IS/MND) was made available for public review for a period of 30 days from November 4, 2015 through December 3, 2015. The IS/MND was adopted by IRWD Board of Directors at its January 11, 2016 meeting. A Notice of Determination was filed with the Orange County Clerk/Recorder and the CA State Clearinghouse on January 12, 2016.

RECOMMENDATION:

That the Board authorize the General Manager to execute Variance No. 3 in the amount of $64,491 with Kleinfelder for additional engineering services during construction for the Irvine Lake Pipeline North Conversion Reservoir, Project 05407.

LIST OF EXHIBITS:

Exhibit "A" – Variance No. 3

EXHIBIT "A"

IRVINE RANCH WATER DISTRICT
PROFESSIONAL SERVICES VARIANCE

Project Title: ILP North Conversion Reservoir

Project No.: 05407 Date: June 26, 2018
Purchase Order No.: 600752 Variance No.: 3

Originator: [ ] IRWD [ ] ENGINEER/CONSULTANT [X] Other (Explain) combined

Description of Variance (*attach any back-up material*):
Additional engineering services during construction due to extended construction schedule. See Attachment for more background information.

Engineering & Management Cost Impact:

Classification	Manhours	Billing Rate	Labor $	Direct Costs	Subcon. $	Total $
SUBTASK B: Misc Construction Support	70	varies	$4,214.32	$0	$6,321.47	$10,525.79
SUBTASK C: RFIs	120	varies	$7,252.09	$0	$10,878.13	$18,130.22
SUBTASK E: Site Visits	70	varies	$4,105.23	$0	$6,157.85	$10,263.08
SUBTASK F: Shop Drawing Review	170	varies	$10,224.89	$0	$15,337.33	$25,562.22
					Total $ =	64,491.30

Schedule Impact:

Task No.	Task Description	Original Schedule	Schedule Variance	New Schedule
	Construction Phase Services	Contract Completion (Baseline): July 2018		Contract Completion: February 2019

Required Approval Determination:

Total Original Contract	$ 250,470	[ ] Director: Cumulative total of Variances less than or equal to $50,000.
Previous Variances $ 75,000 This Variance $ 64,491		[ ] Executive Director: Cumulative total of Variances less than or equal to $75,000.
Total Sum of Variances New Contract Amount	$ 139,491 $ 389,961	[ ] General Manager: Cumulative total of Variances less than or equal to $100,000.
Percentage of Total Variances to Original Contract	56 %	[X] Board: Cumulative total of Variances greater than $100,000.

ENGINEER/CONSULTANT: Kleinfelder
Company Name

Laura Nolan — June 26, 2018
Project Engineer/Manager — Date

Engineer's/Consultant's Management — Date

IRVINE RANCH WATER DISTRICT

RKM Kevin L Burton — 6/28/18
Department Director — Date

General Manager/Board — Date

IRVINE RANCH WATER DISTRICT

PROFESSIONAL SERVICES VARIANCE REGISTER

Project Title: ILP North Conversion Reservoir

Project No.: 05407 Project Manager: Jacob Moeder

Variance No.	Description	Dates		Variance Amount
		Initiated	Approved	
1	Additional design work to accommodate revised ICDC Construction Schedule.	12/20/16	1/6/17	$62,053
2	Additional design work to revise overflow/outfall design	3/20/17	3/29/17	$12,947
3	Additional Engineering Services During Construction	6/26/18		$64,491

KLEINFELDER
Bright People. Right Solutions.

ILP N. Conversion Reservoir Project
Variance No. 3
Updated June 26, 2018

Task 4 – Construction Phase Services

Subtask B: Miscellaneous Construction Support
Kleinfelder will continue to provide ongoing construction support to assist IRWD with answering contractor's questions, reviewing change orders as needed, and other support throughout the construction duration. Additional effort is required to support IRWD due to the extension of the contract duration and the nature of the questions received by the Contractor. This additional effort is estimated to support the project through the remaining duration and assumes approximately 10 hours per month.

Subtask C: Contractor's Request for Information (RFIs)
The level of effort required for individual RFI reviews has exceeded the original estimate. Kleinfelder has reviewed and responded to 56 RFI's to date and estimates an additional 30 RFIs for the remainder of the project. This additional effort assumes approximately 4 hours per RFI.

Subtask E: Site Visits
Additional site visits have been required that exceed the original estimate. Considering the remaining work to be completed by the Contractor, Kleinfelder expects to perform 7 additional site visits to observe the progress and quality of the executed work of the Contractor. The site visit effort includes coordination time as well time to prepare a summary of the site visit.

1. Structural site visit to observe the cracks in the roof
2. Piping site visit
3. Mechanical site visit
4. Civil site visit
5. Electrical site visit
6. Two Miscellaneous site visits

Subtask F: Shop Drawing Reviews
The level of effort required for individual shop drawing reviews has exceeded the original estimate. Kleinfelder has reviewed 146 submittals to date, including 40 resubmittals, 13 second resubmittals and several additional resubmittals. Kleinfelder estimates there will be approximately 30 additional submittals and 15 resubmittals.

550 W C St #1200 San Diego, CA 92101 p | 619 831 4600

July 17, 2018
Prepared by: J. Moeder/R. Mori
Submitted by: K. Burton
Approved by: Paul A. Cook

ENGINEERING AND OPERATIONS COMMITTEE

SEWAGE TREATMENT MASTER PLAN
BUDGET INCREASE AND CONSULTANT SELECTION

SUMMARY:

IRWD prepared a Wastewater Treatment Master Plan in 2003 to identify conveyance and treatment facility improvements to meet capacity and regulatory requirements through 2025. IRWD's sewage and recycled water systems have changed significantly since then, and the service area is approaching buildout. Staff solicited proposals to develop a new master plan that will identify optimal locations and methods for conveying, treating, and distributing sewage and recycled water in the service area through buildout. Staff recommends that the Board approve a budget increase in the amount of $209,000, from $921,300 to $1,130,300, for Project 05427 and in the amount of $104,500, from $454,300 to $558,800, for Project 07141, and authorize the General Manager to execute a Professional Services Agreement with HDR in the amount of $1,070,600 for engineering services for the Sewage Treatment Master Plan.

BACKGROUND:

In 2003, IRWD prepared a Wastewater Treatment Master Plan that defined a logical, cost effective program to upgrade and expand the District's recycling treatment plants to handle projected sewage flows, meet effluent quality requirements, and satisfy recycled water demands through 2025. Staff has since proceeded with the implementation of many of the recommendations in the 2003 master plan including the Michelson Water Recycling Plant (MWRP) Phase 1 and Phase 2 Upgrades, Los Alisos Water Recycling Plant (LAWRP) 2005 Upgrades, and the Harvard Avenue Trunk Sewer Diversion to MWRP. The service area and water recycling plants have experienced a number of changes since completion of the master plan, which is prompting staff to prepare a new master plan that will evaluate the sewer system through buildout.

The new Sewage Treatment Master Plan (STMP) will:

- Characterize sewage for such constituents as organic content and nutrients;
- Evaluate and account for impacts associated with increased loadings as a result of conservation;
- Determine future sewage conveyance requirements to MWRP and LAWRP;
- Identify future treatment processes and their associated capacities at MWRP and LAWRP;
- Identify beneficial uses of sewage;
- Evaluate alternatives for minimizing sewage diversion to Orange County Sanitation District; and
- Identify ways of managing the sewage collection and treatment systems in the most cost effective manner.

The STMP will utilize the District's recently updated sewage and recycled water supply and demand projections to determine the optimal locations and methods for conveying, treating, and distributing the District's sewage and recycled water. A core component of the master plan will include the development of a long-term plan for LAWRP relative to its ultimate treatment processes and capacity. The STMP will result in the identification of capital improvement projects necessary to implement the recommendations and a corresponding implementation program for those improvements.

Consultant Selection:

Staff received proposals for the STMP from AECOM, Black & Veatch, HDR, and Jacobs (formerly CH2M). The HDR proposal far exceeded the other proposals in all aspects including project team, project understanding, and project approach. HDR's proposal provided a clear, concise methodology for completing the work and included a comprehensive and fully detailed scope of work that defined its approach to performing each step of the project. After reviewing the proposals, staff met with HDR to discuss and negotiate the final scope, schedule, fee, and hourly billing rates. Since the proposal reviewers unanimously agreed that HDR's proposal for exceeded the other proposals, the reviewers did not rank the other three proposals. HDR's scope of work and fee proposal are attached as Exhibit "A".

Staff recommends that the Board authorize the General Manager to execute a Professional Services Agreement in the amount of $1,070,600 with HDR since its project understanding, approach, team, and experience are consistent with the project goals and objectives. HDR's fee is in the range of the other three proposals received, which ranged from $836,735 to $1,089,530. HDR has extensive experience providing engineering services for the District including the 2003 Wastewater Treatment Master Plan, LAWRP 2005 Upgrades, Recycled Water Salt Management Plan, and several other studies and evaluations.

Staff anticipates initiating the project in August; project completion is estimated in March 2020.

FISCAL IMPACTS:

Projects 05427 and 07141 for the Sewage Treatment Master Plan are included in the FY 2018-19 Capital Budget. A budget increase is required to fund the engineering services as shown in the table below. Project 05427 will fund 67% of the project through regional sewer funds, and Project 07141 will fund 33% of the project through regional recycled water funds.

Project No.	Current Budget	Addition <Reduction>	Total Budget
05427	$ 921,300	$ 209,000	$ 1,130,300
07141	$ 454,300	$ 104,500	$ 558,800
Total	$ 1,375,600	$ 313,500	$ 1,689,100

ENVIRONMENTAL COMPLIANCE:

This study is exempt from the California Environmental Quality Act (CEQA) as authorized under the California Code of Regulations, Title 14, Chapter 3, Section 15262 which provides exemption for planning studies.

RECOMMENDATION:

That the Board approve a budget increase in the amount of $209,000, from $921,300 to $1,130,300, for Project 05427 and in the amount of $104,500, from $454,300 to $558,800, for Project 07141; and authorize the General Manager to execute a Professional Services Agreement with HDR in the amount of $1,070,600 for engineering services for the Sewage Treatment Master Plan, Projects 05427 and 07141.

LIST OF EXHIBITS:

Exhibit "A" – HDR Scope of Work and Fee Proposal

Scope of Work

Based on our review of the project requirements and discussions with IRWD staff, we have developed a scope of work for the Sewage Treatment Plant Master Plan. The scope of work is organized and detailed to provide a clear understanding of the project work and so that progress can be monitored and verified. We will be pleased to add, delete or modify any of the individual scope items during negotiations with the District.

In developing our scope, we have modified the work plan outlined in the RFP to facilitate an efficient flow of the required analyses, evaluations, decisions and documentation:

- We have organized the tasks into five work areas:
  - A. Project Management and Meetings
  - B. Basis of Planning
  - C. Alternatives Development and Evaluation
  - D. Design Criteria and Implementation Plan
  - E. Project Report
- For each task, we have organized the scope into four topics: 1) services to be performed by HDR, 2) responsibilities of IRWD, 3) assumptions that impact the level of effort or extent of the work, and 4) work products.
- We have added optional tasks for IRWD's consideration. The scope for this work is shown in green font. The cost for this work has been identified separately in the proposed budget and is not included in the budget for the baseline scope.
- While we have included all work elements addressed in the RFP, in some cases, we have shifted specific work among the tasks to align with the overall work flow. For example:
  - For the Sewer Collection Model, we become familiar with the model in Task B3 and use the model to size and evaluate conveyance system modifications in Tasks C1 and D2.
  - We have separated discussion of treatment goals and treatment alternatives, with treatment goals addressed in Task B5 and treatment alternatives addressed in Tasks C1 and C2.
- The changes listed above have resulted in different task numbering from those listed in the RFP.

WORK AREA A – PROJECT MANAGEMENT AND MEETINGS

Objectives:

- Organize, plan and manage resources and activities to meet the District's goals.
- Conduct effective workshops and meetings throughout the project.

Task A1 – Project Management

HDR shall conduct project management activities to ensure adherence to the scope, schedule and budget; promote efficient communication with IRWD staff and others as required; and implement an effective quality assurance/quality control (QA/QC) program.

HDR Services

1. **Project Management Plan**. Prepare a project management plan identifying project scope, individual work elements, budget for each element, responsible individuals for each work element, staffing plan and schedule. The Project Management Plan will be for HDR use only but will be submitted to IRWD for their records.
2. **QA/QC and Technical Review.** Organize and develop an effective QA/QC program specific to the project to ensure project success and accuracy. Conduct technical reviews throughout the project for the various deliverables. Provide a qualified technical review team and adequate budget for its participation.
3. **Cost Control/Progress Reporting.** Prepare weekly and monthly status reports. Each weekly status report will be a brief (one or two paragraph) e-mail, summarizing the activities completed the previous week, the activities planned for the upcoming week, and critical decisions that need to be made. The monthly status reports shall provide more detail, summarizing the work completed and reviewing work status relative to budget and schedule. The project schedule shall be updated monthly for inclusion in the monthly report. All monthly reports shall be submitted to IRWD's Project Manager with the monthly invoices.
4. **Management of Subconsultants.** Prepare agreements with all subconsultants participating on the project, and monitor their work in terms of product, quality, schedule and budget.

IRWD's Responsibilities

1. Coordination with other consulting teams performing concurrent, related projects.
2. Prompt review of project submittals and coordination of all review comments.
3. Prompt processing and payment of compliant invoices.

Assumptions

1. The project duration will be in accordance with the project schedule enclosed herein.

Work Products

1. Weekly status reports.
2. Monthly reports and invoices.

Task A2 – Meetings and Workshops

HDR will organize, prepare for, facilitate and document effective meetings to communicate with District staff and stakeholders. The estimated number of workshops is based on our experience working with IRWD on the 2003 Wastewater Treatment Facility Master Plan, the 2011 Biosolids Master Plan, and the Salt Management Plan.

HDR Services

Meeting Summary Table summarizes the workshops and meetings anticipated during the project. This table lists all meetings and workshop by task, and identifies the meeting topic or function, the estimated meeting duration and the number of consultant team participants.

IRWD's Responsibilities

1. Attendance at meetings by Project Manager and technical staff as appropriate.
2. Provide and arrange for meeting rooms.

Assumptions

1. Although meetings may be discussed in the scopes for other tasks, all costs for meeting attendance and documentation are included in this task. Costs for preparing technical materials for the meetings are covered in other tasks.
2. Project management meetings will be held immediately prior to or following other meetings or workshops.
3. HDR will not provide meals at meetings and workshops.

Work Products

1. Agenda and handouts for 59 meetings and workshops, submitted for IRWD review and concurrence at least five days prior to the meeting.
2. PowerPoint presentations for 15 workshops.
3. Minutes for 59 meetings and workshops, submitted within one week of the meeting.

WORK AREA B – BASIS OF PLANNING

Objective:

- Research, analyze and document key technical and planning information needed for the subsequent development and evaluation of sewage and recycled water management alternatives.

Task B1 – Review Previous Studies

HDR will review prior studies pertinent to the Sewage Treatment Plant Master Plan to understand previous evaluations and recommendations.

HDR Services

1. Review prior studies identified by IRWD.
2. Prepare brief summaries of each study that includes scope, key findings, recommendations and unresolved issues (if any).
3. Compile and distribute summaries to the project team.

IRWD's Responsibilities

1. Identify and provide access to prior studies relevant to the Master Plan.
2. Provide access to District staff familiar with the studies.

Assumptions

1. Anticipated studies to review include the 20 reports listed in the District's "Summary of Existing Reports Related to LAWRP and MWRP".

Work Products

1. Compilation of brief summaries of the prior work. This compilation will be an appendix to the Final Report.
2. Provide 10 hard copies and one electronic copy (PDF).

Task B2 – Review Interagency Agreements

HDR will review interagency agreements that govern the transfer, treatment and use of sewage, recycled water and biosolids.

HDR Services

1. Review agreements with OCSD, OCWD, SMWD, ETWD, SOCWA and other jurisdictions that potentially

impact the Sewage Treatment Master Plan.

2. Discuss with IRWD staff anticipated or potential changes to the agreements that may occur during the planning period.

IRWD's Responsibilities

1. Identify and provide access to interagency agreements relevant to the Master Plan.

2. Provide access to District staff familiar with the agreements.

Assumptions

1. None

Work Products

1. Provide matrix of agreements that includes potential impacts to the STPMP and assumptions to be made.

Task B3 – Sewer Collection Model

HDR will review the Sewer Collection Model, become familiar with its use, and identify potential sewage transfer scenarios.

HDR Services

1. Review available documentation associated with the collection system model development, including sewage flow generation methodologies and assumptions.

2. Develop and run test scenarios to become familiar with the model's use.

3. Meet with District staff to discuss unique aspects of the model and identify any known issues, limitations or idiosyncrasies associated with the tool.

4. Preliminarily identify logical places in the collection system to redirect flows to and from wastewater treatment plants operated by IRWD and other jurisdictions.

IRWD's Responsibilities

1. Provide the InfoSWMM model and associated documentation and reports.

2. Meet with HDR staff to review the model.

3. Make staff available to answer questions.

Assumptions

1. In this task, the effort associated with redirection of flows is limited to a preliminary determination of likely diversion locations. This information will be useful in developing system-wide alternatives. More detailed analysis of potential collection system modifications is included in Task C1 and D2.

Work Products

1. Brief memorandum summarizing potential locations to redirect flows to the various treatment plants. This summary will be an appendix to the Final Report.

2. Provide 10 hard copies and one electronic copy (PDF).

Task B4 – Sewage Flow Characterization and Flow Projections

This task will project sewage flow and loads from sewer tributary areas, including sewage that could be directed to or from neighboring jurisdictions. The information developed will be used in the subsequent development of "system-wide wastewater management strategies".

HDR Services

1. Flow Projections

    a. Meet with IRWD to discuss the flow projections incorporated in the SCSMP and collection system model.

        i. Determine whether changes or updates to the flow projections are needed due to changes in land use projections, sewer flow generation factors, or other reasons.

        ii. Discuss any concerns or issues associated with flow monitoring conducted during the SCSMP and development of hydrographs and peaking factors.

        iii. Discuss the potential for per capita flows to further decrease in the future due to water conservation, lowered groundwater levels and other factors. Jointly decide how to handle this variable through sensitivity analyses, scenario planning or other approaches.

        iv. Discuss the potential for changes in interagency flow routing.

        v. Discuss the potential for diverting urban runoff to IRWD's collection system and treatment plants.

    b. Collect and statistically analyze influent flow data for MWRP and LAWRP to determine key peaking factors needed for permit compliance evaluations, treatment sizing and cost estimates (annual average,

maximum month, maximum day and peak hour). In particular, review the influent data during recent wet years to see if the wet weather peaking factors used in the SCSMP are sufficiently conservative.

c. Review hydrographs from key locations in the service area to determine if significant variations in peaking factors occur.

d. Define month-by-month variations of influent flows to allow determination of the seasonal variation in recycled water production.

e. Based on the above information, update current and future flow projections and peaking factors for the designated sewer tributary areas.

f. For each major sewershed, summarize projected annual flows in 5-year increments through the planning horizon and at buildout.

2. Wastewater Characteristics and Loadings

   a. Collect and statistically analyze influent concentration and loading data for MWRP and LAWRP.

      i. Based on current population and land use data, determine per dwelling unit loading rates for key constituents such as BOD, TSS and nutrients. Discuss with IRWD how anticipated development and land use changes could impact future per dwelling unit loading rates. Develop and implement a methodology to quantify current and projected loadings from industrial and commercial sources.

      ii. Determine key peaking factors needed for permit compliance evaluations, treatment sizing and cost estimates (annual average, maximum month, maximum day and peak hour).

      iii. Update trends in influent and effluent TDS concentrations (based on prior work in the Salt Management Plan).

      iv. Review and analyze data on Priority Pollutants, focusing on constituents that may be listed in future NPDES Permits (e.g., mercury) or constituents that may impact effluent use options such as IPR/DPR.

      v. Review IRWD's Local Limits Study and summarize key requirements.

   b. Collect and statistically analyze available wastewater concentration and loading data from 1) tributary areas routed to other jurisdictions (e.g., IBC) or 2) within smaller segments of the MWRP and LAWRP service areas.

   c. Based on the above information, coupled with population and land use projections, update current and future load projections, wastewater characteristics and peaking factors for the designated sewer tributary areas.

   d. Summarize projected annual loadings in 5-year increments through the planning horizon and at buildout.

3. Additional Data Collection

   a. Identify data gaps and develop recommended sampling needed to better evaluate wastewater management and treatment alternatives. Potential sampling may include:

      i. Wastewater characterization of critical sewersheds.

      ii. Constituents important to pretreatment for IPR/DPR systems.

4. Results Workshop

   a. Hold a workshop with IRWD staff to summarize flow and loading findings.

5. Technical Memorandum

   a. Prepare and submit a draft memorandum summarizing findings. Meet with IRWD to discuss review comments. Prepare a final memorandum incorporating review comments.

IRWD's Responsibilities

1. Update land use and sewer generation factors (if needed) and provide revised sewage flow input values to HDR.

2. Provide appropriate data from IRWD's water quality database.

3. Conduct supplemental sampling and analyses, if needed.

Assumptions

1. The flow analysis will be based on the 15 sewersheds

identified in the SCSMP.

2. Information on wastewater characteristics for the major interceptors is readily available in IRWD's water quality database.

3. The analysis is limited to IRWD's sewer tributary areas. Flow and load projections from areas served by adjacent jurisdictions will be developed by others and made available to HDR.

4. Supplemental sampling requirements will be low (if any), and will not impede the project schedule.

Work Products

1. Draft and final technical memoranda. This memorandum will be converted to a chapter in the Final Report.

2. Provide 10 hard copies and one electronic copy (PDF).

Task B5 – Treatment Goals and Objectives

This task will define treatment goals to meet anticipated regulatory limits, satisfy end user requirements, permit effective management of water quality in distribution systems and reservoirs, and provide appropriate pretreatment for potential IPR/DPR advanced treatment systems. It also will review the ability of the District's treatment plants to meet these limits and goals.

HDR Services

1. Identify Water Quality Driving Forces and Effluent Requirements

    a. Meet with IRWD to 1) identify all potential uses of the effluent from IRWD's treatment plants, and 2) discuss issues of concern regarding current and future permit compliance, water quality degradation in distribution systems, water quality management in reservoirs, etc.

    b. Interview appropriate IRWD staff to define specific water quality requirements and issues for major categories of end users. For end user groups with stringent or unusual water quality requirements, define approximate quantity of demand associated with this use.

    c. Interview appropriate regulatory personnel to identify the potential for future changes to IRWD's permit requirements and to identify the likely timing of the changes.

    d. Review regulatory developments for IPR/DPR systems and define best practices for pretreating wastewater to serve as a source of supply for advanced IPR/DPR treatment systems.

    e. Based on the above tasks, summarize anticipated water quality and regulatory requirements for recycled water (Title 22, specific end user requirements, reservoir management), ocean discharge (SOCWA Outfall and OCSD Outfall through GAP), stream discharge (San Diego Creek) and source water feed to IPR/DPR treatment systems (GWRS and new facilities).

2. Define Ability of District Plants to Comply with Water Quality Requirements

    a. Obtain and analyze effluent quality and performance data for MWRP and LAWRP.

    b. Obtain and analyze available water quality data from distribution systems and storage reservoirs.

    c. Identity data gaps and define recommended sampling and analyses to address gaps.

    d. Compare effluent quality with goals.

    e. Identify wastewater characteristics or limitations in current or anticipated treatment practices that could prevent IRWD from meeting the water quality goals.

3. Results Workshop

    a. Hold a workshop with IRWD staff to summarize findings regarding water quality goals and compliance.

4. Technical Memorandum

    a. Prepare and submit a draft memorandum summarizing findings. Meet with IRWD to discuss review comments. Prepare a final memorandum incorporating review comments.

IRWD's Responsibilities

1. Provide appropriate data from IRWD's water quality database.

2. Participate in meetings.

3. Prompt review of submittals.

4. Conduct supplemental sampling and analyses, if needed.

Assumptions

1. Information on water quality and treatment performance is readily available in IRWD's water quality database.
2. Meetings with regulatory personnel can be conducted within the schedule constraints of the project.
3. Supplemental sampling requirements will be low (if any), and will not impede the project schedule.

Work Products

1. Draft and final technical memoranda. This memorandum will be converted to a chapter in the Final Report.
2. Provide 10 hard copies and one electronic copy (PDF).

Task B6 – Treatment Facility Capabilities and Limitations

This task will summarize the hydraulic and treatment capacities of the District's treatment plants and identify known deficiencies or limitations that may need to be addressed as part of the Master Planning process.

HDR Services

1. Meet with IRWD operations and maintenance staff to identify process limitations, operational/control issues and maintenance/condition concerns. The goal of these discussions is to identity existing limitations that may drive significant capital expenditures beyond those needed for capacity expansion or water quality compliance.
2. Using HDR's existing, calibrated process models along with updated flow and loading projections, define the current treatment capacities for MWRP and LAWRP.
3. Review the hydraulic capacity of the MWRP and LAWRP and identify bottlenecks.
4. Review the recycled water production efficiency at MWRP and IRWD.
5. Prepare and submit a draft memorandum summarizing findings. Meet with IRWD to discuss review comments. Prepare a final memorandum incorporating review comments.

IRWD's Responsibilities

1. Participate in meetings.
2. Prompt review of submittals.

Assumptions

1. This task will not involve condition assessments or significant site investigations.
2. Since this task includes two workshops with IRWD staff to discuss the treatment systems, a results workshop will not be needed.

Work Products

1. Draft and final technical memoranda. This memorandum will be converted to a chapter in the Final Report.
2. Provide 10 hard copies and one electronic copy (PDF).

Task B7 – Water Supply and Demand for Recycled Water Distribution System

This task provides a comprehensive supply and demand analysis for IRWD's non-potable water system. It incorporates alternative sources of supply (sewage, urban runoff, groundwater, Irvine Lake water, IDP, etc.) and existing and potential uses of treated water (irrigation, IPR/DPR, surface water discharge, etc.).

HDR Services

1. Define Supply Sources
   a. Sewage
      i. Based on the results of Task B4, define the current and projected quantity of sewage tributary to IRWD's treatment plants. Include "what if" scenarios, such as re-routing IBC, changes to interagency transfers, routing of urban runoff to the collection system, etc.
      ii. Develop estimates of effluent production efficiencies for different effluent water qualities (e.g., secondary effluent, Title 22, potable water).
      iii. Project available treated effluent supply on an annual and month-by-month basis through the planning horizon and at buildout.
   b. Other Non-Potable Water Supplies
      i. Meet with IRWD to identify other current or potential supplies of non-potable water including IDP, groundwater and Irvine Lake untreated water.
      ii. Obtain data on quantity, annual and seasonal availability, water quality, constraints, cost and other factors that could influence the overall

supply and demand analysis.

c. Supply Summary

i. Develop tables and graphs summarizing non-potable water supply alternatives through the planning horizon. Develop projections on an annual and month-by-month basis. Discuss where the various sources of supply are currently located and how they are connected to IRWD's non-potable supply system.

2. Define Treated Effluent Uses

a. Meet with IRWD to review current and potential uses for the District's treated effluent and other non-potable water supplies. As part of these discussions, brainstorm additional opportunities to beneficially use the water or increase system resiliency against oversupply. For each use, define projected or potential water demands or discharge availability on an annual and seasonal basis. Define current and potential storage capabilities.

b. The analysis of treated effluent use will include:

i. Non-potable water supply, both within and without IRWD's service area, including consideration of regional demand projections.

ii. Potable water supply including new IPR/DPR facilities and provision of source water to GWRS.

iii. Surface water discharge to San Diego Creek and the ocean.

iv. GAP

3. Identify anticipated revenue and costs associated with the end use alternatives including non-potable and potable water rates, CORF, etc.

4. Identify preliminary source water/end use scenarios and develop supply/demand water balances. This information will be used to shape development of potential system-wide management alternatives.

5. Results Workshop

a. Hold a workshop with IRWD staff to summarize findings regarding water supply and demand.

6. Technical Memorandum

a. Prepare and submit a draft memorandum summarizing findings. Meet with IRWD to discuss review comments. Prepare a final memorandum incorporating review comments.

IRWD's Responsibilities

1. Participate in meetings.
2. Provide appropriate data from water supply reports and analyses.
3. Prompt review of submittals.

Assumptions

1. Supply/demand analyses will be developed for 3 to 5 source water/end use scenarios.

Work Products

1. Draft and final technical memoranda. This memorandum will be converted to a chapter in the Final Report.
2. Provide 10 hard copies and one electronic copy (PDF).

WORK AREA C – ALTERNATIVES DEVELOPMENT AND EVALUATION

Objectives:

- Develop a logical, transparent and defensible plan for evaluating alternatives and making decisions.
- Identify solutions that increase the effectiveness of IRWD's treatment and recycled water systems, meet existing and future water quality requirements, increase resiliency, and provide the best return on investment for the District's customers.

Task C1 – System-Wide Alternatives for Conveyance and Treatment

This task identifies and evaluates "big picture" alternatives for configuration and management of IRWD's sewage collection, treatment, biosolids management, and treated effluent use and discharge systems.

HDR Services

1. Define Evaluation Methodology and Decision Making Process

a. Define the evaluation methodology, tools and criteria for use in comparing system-wide management alternatives.

b. Define the decision making process for the alternatives and evaluation stages. Identify who needs to be participate, when they need to be

involved, and what information they will require – both content and format.

c. Prepare a cost model for use in evaluating and comparing system-wide alternatives. Identify all assumptions and review these with District staff. Define the format for presenting cost estimate results. Prepare a memorandum documenting the model assumptions and use.

   Cost components will be discussed with IRWD, but some of the anticipated components include capital costs, operating costs, land, OCSD charges, SOCWA outfall disposal, and potential costs impacted by the IPR/DPR alternative, including the Basin Equity Assessment (BEA), the Replenishment Assessment (RA), and the cost of importing treated MWD water. In evaluating these costs, we will focus on those cost categories that are differentiators for the alternatives.

   - Capital costs for treatment and conveyance systems will be developed using HDR's parametric cost models which are updated to reflect local conditions and market trends. We will supplement this tool with vendor quotes and specialized approaches for any unique circumstances.
   - Operating costs will include treatment plant O&M, sewage conveyance, recycled water pumping, recycled water pretreatment (if needed), potable water treatment (if added), and the cost of imported water used for non-potable supply; Revenue costs will include the sale of recycled water or potable water generated from a recycled water supply.
   - OCSD costs will include CORF, equity, and O&M charges.
   - Land costs will be based on real estate values in the areas impacted.

2. Brainstorm, Consolidate and Screen System-Wide Alternatives

   a. Perform the following work during a workshop with IRWD:

      i. Based on the information developed during the Basis of Planning tasks, brainstorm system-wide alternatives for conveyance and treatment. These alternatives should provide a comprehensive management program for IRWD's sewage, but may include various combinations of the following attributes:

         1. Number and location of treatment plants
         2. Amount of sewage routed to each plant
         3. Treated effluent uses or discharge (location and annual/seasonal quantities)
         4. Treated effluent conveyance and storage

      ii. Consolidate and screen the alternative management strategies to eliminate fatally flawed concepts and to reduce the number of alternatives to a manageable number for detailed evaluation.

3. Confirm Short List of Alternatives for Evaluation

   a. Conduct a follow-up meeting to refine the short-listed management alternatives, and to clarify expectations, methodologies and deliverables for the detailed evaluation of the alternatives.

4. Identify Representative Treatment Processes for Use in System-Wide Alternatives

   a. For each short-listed system-wide management alternative, define the amount of capacity IRWD must provide in each District-owned treatment plant. Develop these capacity projections in 5-year increments through the planning horizon.

   b. For those plants needing capacity increases, conduct a workshop with IRWD staff to identify and screen conceptual treatment approaches for achieving the capacity increase and/or effluent quality improvement. The selected "representative treatment" concepts will be used for initial estimation of expansion costs for use in the overall evaluation of system-wide management alternatives. Identify logical phasing of the capacity expansions and upgrades.

   c. Similarly, develop representative biosolids management concepts for use in evaluating the system-wide alternatives.

   d. Develop estimated capital and operating costs for capacity expansion alternatives.

   e. For alternatives that involve reducing flows to, or

abandoning use of, a treatment facility, estimate the revenue or avoided costs that would result from this action (e.g., elimination of LAWRP, reduction of sewage flow to OCSD).

f. Identify key issues or constraints associated with increasing or reducing treatment of IRWD sewage at treatment facilities owned by IRWD or other adjacent jurisdictions.

g. Prepare and submit a draft memorandum summarizing findings. Meet with IRWD to discuss review comments. Prepare a final memorandum incorporating review comments.

5. Develop Short-Listed System Wide Alternatives

   a. Incorporating the representative treatment concepts identified in the prior subtask, develop short-listed system-wide alternatives on a conceptual level. Identify and quantify sources of sewage for each plant and uses of treated effluent. Refine water supply and demand balances. Define, locate and size major conveyance, liquid treatment and biosolids processing components. Define roles of IRWD and potential partners (if any). Develop cost and revenue information for use in the cost model, including avoided costs.

   b. Prepare descriptions of each system-wide alternative, and discuss the options relative to the selected evaluation criteria.

6. Evaluate and Select System-Wide Management Plan

   a. In a workshop with IRWD, review the short-listed System-Wide Alternatives and rate them against the evaluation criteria. Based on the analyses, select the preferred system-wide management plan.

7. Technical Memorandum

   a. Prepare and submit a draft memorandum summarizing findings. Prepare a final memorandum incorporating review comments.

IRWD's Responsibilities

1. Attendance at meetings by IRWD Project Manager and technical staff as appropriate.
2. Provide historical information on capital and operating costs of IRWD facilities.
3. Use the District's Recycled Water Hydraulic Model to analyze and size recycled water conveyance components included in the system-wide alternatives
4. Prompt review of submittals
5. Coordination of review comments.

Assumptions

1. Up to 5 system-wide alternatives will be evaluated.
2. Detailed analysis of treatment plants owned and operated by other agencies will not be required.
3. HDR will use IRWD's Sewer Collection Model to define sewage conveyance improvements.
4. Analysis excludes consideration of an IPR/DPR project other than pretreatment considerations at MWRP and LAWRP for future IPR/DPR.

Work Products

1. Evaluation Criteria
2. Cost model
3. Interim memorandum on representative treatment and biosolids management concepts for use in the system-wide alternatives analysis.
4. Draft and final technical memoranda. This memorandum will be converted to a chapter in the Final Report.
5. Provide 10 hard copies and one electronic copy (PDF).

Task C2 - Plant Specific Alternatives Analysis

This task will address site-specific technology selection and site layout issues for each treatment plant based on the selected system-wide water management plan.

HDR Services

1. Refine the evaluation criteria for use in comparing plant specific technology alternatives.
2. Based on interim and long-term capacity requirements, conduct a workshop with IRWD to brainstorm and screen liquid treatment and biosolids management alternatives. Summarize findings in a memorandum.
3. Develop short-listed alternatives in detail. Development will include sizing of major treatment units; preliminary process schematics; estimates of land requirements; estimates of capital and operating costs; and discussion of phasing opportunities.

4. Conduct a workshop with IRWD to review treatment alternatives and preliminary evaluations. Gain input from IRWD for refinement/additional evaluation required prior to selection of a preferred alternative.

5. Conduct workshops to review refinements and select preferred alternatives for both MWRP and LAWRP (one workshop per plant). Summarize findings in a memorandum.

6. Prepare and submit a draft memorandum summarizing findings. Meet with IRWD to discuss review comments. Prepare a final memorandum incorporating review comments.

IRWD's Responsibilities

1. Participate in workshops.

2. Prompt review of submittals.

Assumptions

1. Level of effort is based on expanding the MWRP and LAWRP to nominal capacities of 33 and 7.5 mgd, respectively.

Work Products

1. Workshop summaries.

2. Memoranda summarizing treatment alternatives.

3. Draft and final technical memoranda. This memorandum will be converted to a chapter in the Final Report.

4. Provide 10 hard copies and one electronic copy (PDF).

WORK AREA D – DESIGN CRITERIA AND IMPLEMENTATION PLAN

Objectives:

- Provide clear definition of treatment and conveyance facilities needed to implement the preferred system-wide management strategy.
- Develop logical phasing and implementation plans.
- Refine capital and operating costs.
- Sufficiently develop required system components to allow IRWD to proceed with subsequent implementation steps, including preliminary design.

Task D1 – Conceptual Design of Treatment Facilities

This task will develop a conceptual design for each treatment plant, addressing design criteria, process definition and site layout issues.

For the purposes of preparing scope and fee, the following assumptions have been made regarding the number of IRWD treatment facilities that will require conceptual designs and the level of complexity involved in the expansion and modifications for the treatment processes. These assumptions are for budgeting only and do not prejudge selection of capacity allocations and treatment technologies:

- IRWD will continue to have two treatment plants: MWRP and LAWRP
- MWRP will be expanded to 33 mgd using MBR technology and the current biosolids processing system.
- LAWRP will consist of a new liquid treatment system and will convey liquid or dewatered biosolids to MWRP for further processing.

HDR Services

1. HDR will provide the following design information on the selected concepts for upgrading and expanding IRWD's treatment plants:
   a. Design flows and loads
   b. Effluent quality requirements
   c. Process flow diagram
   d. Mass balance diagram
   e. Hydraulic profile
   f. Unit process design criteria table
   g. Sizing of key facilities
   h. Narrative description of unit processes
   i. Preliminary process and major equipment selection
   j. Site plan
2. Review Workshops
   a. Conduct a workshop for each treatment plant to review the conceptual designs.
3. Prepare and submit a draft memorandum summarizing findings. Meet with IRWD to discuss review comments. Prepare a final memorandum incorporating review comments.

IRWD's Responsibilities

1. Participate in meetings.
2. Prompt review of submittals.

Assumptions

1. Conceptual designs will be developed for two IRWD treatment plants.
2. Conceptual designs exclude an IPR/DPR plant.

Work Products

1. Draft and final technical memoranda for each treatment plant. These memoranda will be converted to chapters in the Final Report.
2. Provide 10 hard copies and one electronic copy (PDF).

Task D2 – Conceptual Design of Collection and Conveyance Facilities

HDR will develop conceptual designs for major facilities required to convey sewage to treatment plants or convey treated effluent to storage, advanced treatment, surface water discharge or other end use locations.

HDR Services

1. HDR will provide the following design information on the selected concepts for conveying sewage or treated effluent:
    a. Design flows
        i. Pumping stations
        ii. Capacity
        iii. Type
        iv. Preliminary location
        v. Narrative description
    b. Pipelines
        i. Diameter
        ii. Preliminary routing
        iii. Narrative description of route, identifying major crossings or other construction challenges.
2. Review Workshop
    a. Conduct a workshop to review the conceptual conveyance designs.
3. Prepare and submit a draft memorandum summarizing findings. Meet with IRWD to discuss review comments. Prepare a final memorandum incorporating review comments.

IRWD's Responsibilities

1. Participate in meetings.
2. Prompt review of submittals.

Assumptions

1. Conceptual designs will be developed for two pump stations and two pipelines.

Work Products

1. Draft and final technical memoranda. This memorandum will be converted to a chapter in the Final Report.
2. Provide 10 hard copies and one electronic copy (PDF).

Task D3 – Environmental Compliance and Permit Requirements

This task will define environmental documentation and permitting requirements to implement the recommended improvements to IRWD's treatment plants and conveyance improvements.

HDR Services

1. Review existing permit conditions associated with owning and operating the MWRP and LAWRP facilities and programs.
2. Identify environmental documentation and permitting required to implement and operate the recommended plan. Prepare a summary table for permit and approval requirements that lists: 1) permit or approval, 2) federal, state, regional or local agency, 3) triggering action or mechanism, 4) information and level of detail needed for application, 5) processing time and 6) comments. Supplement the summary table with a narrative discussion of the most critical permits or approvals, including presentation of an action plan to gain approval.
3. Prepare and submit a draft memorandum summarizing findings. Meet with IRWD to discuss review comments. Prepare a final memorandum incorporating review comments.

IRWD's Responsibilities

1. Provide copies of all current permits and approvals that are relevant to the project.

2. Assist with identifying potential environmental documentation and permit requirements.

3. Prompt review of submittals.

Assumptions

1. Task B5 will address issues associated with current and anticipated effluent quality requirements. It will also discuss the impacts of raw sewage quality on IRWD's ability to meet treatment objectives.

2. The results workshop for Task D3 will be combined with the workshop for Task D4.

Work Products

1. Draft and final technical memoranda. This memorandum will be converted to a chapter in the Final Report.

2. Provide 10 hard copies and one electronic copy (PDF).

Task D4 – Implementation Plan

HDR will develop an implementation plan for the recommended improvements that addresses phasing, constructability issues and maintenance of operation during construction. The plan will include a project schedule and projected capital and operating costs.

HDR Services

1. Develop the following elements of the Implementation Plan:

    a. Phasing Plan. Identify logical phasing for construction of treatment and conveyance components.

    b. Constructability Issues. Discuss key constructability challenges and constraints.

    c. Maintenance of Plant Operation Issues. Identify key issues associated with maintenance of operation and permit compliance during construction. Preliminarily identify mitigation measures.

    d. Capital & O&M Costs. Summarize projected capital and operating costs by facility and by phase.

    e. Implementation Plan and Schedule. Prepare an implementation schedule for all phases of the work including planning, environmental and permitting, design and construction. Provide a narrative discussion of the schedule to clarify assumptions and discuss key issues.

2. Results Workshop

    a. Conduct a workshop to review the permitting and implementation plans.

3. Prepare and submit a draft memorandum summarizing findings. Meet with IRWD to discuss review comments. Prepare a final memorandum incorporating review comments.

IRWD's Responsibilities

1. Prompt review of submittal.

Assumptions

1. None.

Work Products

1. Draft and final technical memoranda. This memorandum will be converted to a chapter in the Final Report.

2. Provide 10 hard copies and one electronic copy (PDF).

WORK AREA E – PROJECT REPORT

Objective:

- Provide a clear, concise report summarizing analyses, findings and recommendations.

- The report will include an executive summary and incorporate content from the technical memos into a single cohesive report that presents the decisions and solutions followed by the analysis and backup information.

Task E1 – Project Report

HDR Services

1. Prepare and submit a draft final report incorporating all technical memoranda developed in prior tasks.

2. Meet with IRWD staff to discuss review comments on draft report.

3. Revise the draft report to respond to formal comments. The revised report will be the final Master Plan.

IRWD's Responsibilities

1. Consolidate review comments for presentation to HDR.

2. Arrange for additional printing (beyond documents defined in work products) and distribution

of documents.

Assumptions

1. The draft Master Plan will be revised once to produce the final Master Plan.

Work Products

1. Ten bound copies of the draft Master Plan.
2. Ten bound copies of the final Master Plan.
3. One electronic copy of the final Master Plan in PDF.

Irvine Ranch Water District
Sewage Treatment Plant Master Plan
Estimated Level of Effort and Fee

NO	TASK DESCRIPTION	LEVEL OF EFFORT, HOURS: Principal	Quality Manager	Project Manager	Alt Dev & Evaluation	WQ & Regulatory	Treatment Technology	RW Policy Planning	Basis of Planning	Sr Technical Expert	Engineering Lead	Senior Engineer	Project Engineer II	Project Engineer I	Staff Engineer II	Staff Engineer I	Modeler	Economic Analyst	Document Specialist	Accountant	Project Coordinator	TOTAL LABOR	FEE, DOLLARS: LABOR	SUBS	DIRECT COSTS	TOTAL	TOTAL
A	**Project Management and Meetings**																										
A1	**Project Management**																										
A1.1	Project Management Plan	1	6	20																4	6	37	9,230	0	231	9,461	
A1.2.1	Quality Assurance Program		8	10																	12	30	6,610	0	165	6,775	
A1.2.2	Quality Control / Technical Review		32	2						64												98	32,270	36,000	807	69,077	
A1.3	Cost Control / Progress Reporting	5		60									40							40	40	185	35,500	0	888	36,388	
A1.4	Management of Subconsultants			20																10		30	7,200	0	180	7,380	
A2	**Meetings and Workshops**																										
A2.1	Project Kick-Off Meeting			4	2			2	2													10	2,910	0	73	2,983	
A2.2	Project Management Meetings (Monthly)			10																		10	2,950	0	74	3,024	
A2.3	Presentations to IRWD Senior Management (2 Workshops)			4	2	2		4	4													16	4,640	0	116	4,756	
A2.4	Presentations to Board (2 Workshops)			4	2	2		4	4													16	4,640	0	116	4,756	
A2.5	Task-Specific Meetings (see Meeting Summary Table)			106	56	15	33	33	77	17	13		3	4			7	1				364	105,080	0	22,627	127,707	
	Subtotal A | Project Management and Meetings	6	46	240	81	19	33	43	87	81	13	0	43	4	0	0	7	1	0	54	88	706	211,090	36,000	25,277	272,367	272,300
B	**Basis of Planning**																										
B1	**Previous Studies**																										
B1.1	Review Previous Studies			12	2			8	16													38	10,100	0	253	10,353	
B1.2	Prepare Summary Memorandum			2	2			2	10								6				2	30	5,780	0	144	5,924	
B2	**Interagency Agreements**																										
B2.1	Review Interagency Agreements			6	4			4	10						8							32	7,730	0	193	7,923	
B2.2	Discussion with IRWD Staff			4					4													8	2,020	0	51	2,071	
B3	**Sewer Collection Model**																										
B3.1	Review Documentation, Methodologies, Assumptions							12									6					18	4,770	0	119	4,889	
B3.2	Run Test Scenarios							2									40					42	7,230	0	181	7,411	
B3.3	Identify Locations for Flow Redirection			4				8									16					28	6,340	0	159	6,499	
B3.4	Technical Memorandum			2				12							12					6	1	33	7,095	0	177	7,272	
B4	**Sewage Flow Characterizations and Flow Projections**																										
B4.1	Flow Projections			8				2	20					20	20	40						110	19,090	0	477	19,567	
B4.2	Wastewater Characteristics and Loading			8					20			20				20						68	13,960	0	349	14,309	
B4.3	Data Analysis			4					8			10		12		30						64	11,300	0	283	11,583	
B4.4	Update Current and Future Projections							4	36							12						52	10,440	0	261	10,701	
B4.5	Technical Memorandum			2				2	16										16		3	39	6,915	0	173	7,088	
B5	**Treatment Goals and Objectives**																										
B5.1	Water Quality Drivers and Effluent Requirements			4	2	6			30							4						46	10,740	0	269	11,009	
B5.2	Define Ability to Comply with WQ Requirements			6	6		16		12													40	11,770	0	294	12,064	
B5.3	Technical Memorandum			2	2	2	4		12						12				6		3	43	8,725	0	218	8,943	
B6	**Treatment Facility Capabilities and Limitations**																										
B6.1	Preparation for IRWD Operations Meetings			4				8	8						8							28	6,740	0	169	6,909	
B6.2	Process Modeling - Update Treatment Capacities			2			8	2			56			16		24						108	27,050	0	676	27,726	
B6.3	Review Treatment Plant Hydraulic Capacities			2				4	28			24			12							70	18,170	0	454	18,624	
B6.4	Review RW Production Efficiency			2			12	4			20	16				12						66	17,090	0	427	17,517	
B6.5	Technical Memorandum			2			4	16	12		12								16		4	66	15,410	0	385	15,795	
B7	**Water Supply and Demand for Recycled Water Dist. System**																										
B7.1	Define Supply Sources			2				12	12						8							34	8,130	0	203	8,333	
B7.2	Define Treated Effluent Uses			2				12	24						8							46	10,650	0	266	10,916	
B7.3	Identify Revenue and Costs for End-Use Alternatives			2				8	36						8							54	11,910	0	298	12,208	
B7.4	Preliminary Source Water / End Use Scenarios			4				8	20								24					56	11,860	0	297	12,157	
B7.5	Technical Memorandum			2				4	12						12				12		2	44	7,960	0	199	8,159	
B8	**Additional Basis of Planning Services**																										
B8.1	Additional Modeling																40					40	6,600	0	165	6,765	
	Subtotal B | Basis of Planning	0	0	89	18	8	44	100	332	40	88	70	0	48	106	148	126	0	62	0	15	1,003	286,695	0	7,140	292,695	292,700
C	**Alternatives Development and Evaluation**																										
C1	**System-Wide Alternatives for Conveyance and Treatment**																										
C1.1	Define Evaluation Methodology and Decision Making Process			8	16			8	4						4	16						56	13,940	0	349	14,289	
C1.2	Brainstorm, Consolidate, Screen System-Wide Alternatives			4	16			8	4						4	12	24					72	16,180	0	405	16,585	
C1.3	Confirm Short List of Alternatives for Evaluation			2	6			12	2							6						28	7,540	0	191	7,631	
C1.4	Identify Representative Treatment Processes			8	8		12				8			8	8							46	13,260	0	332	13,612	
C1.5	Develop Short-Listed System-Wide Alternatives			4	16										16		100					136	25,600	0	640	26,240	
C1.6	Evaluate and Select System Wide Alternatives			8	20			4							24	24	80	40				196	36,770	0	919	37,689	
C1.7	Technical Memorandum			2	12		4	12			4				16	6	8	6	24		4	98	20,200	0	505	20,705	
C2	**Plant-Specific Alternatives Analysis**																										
C2.1	Refine Evaluation Criteria			8	20				4													32	10,000	0	250	10,250	
C2.2	Brainstorm, Consolidate, Screen Plant-Specific Alternatives			8	16		24		8		12				4	16						88	24,140	0	604	24,744	
C2.3	Develop Detailed Short Listed Alternatives			2	12		16								8							38	11,350	0	284	11,634	
C2.4	Refinement of Alternatives and Evaluation			2	12		6								4							24	7,330	0	183	7,513	
C2.5	Evaluate and Select Plant-Specific Alternatives			8	16										16	24		24				88	17,940	0	448	18,286	
C2.6	Technical Memorandum			2	12		6		2						24					24	4	74	14,310	0	358	14,668	
C3	**Additional Alternatives Development Services**																										
C3.1	Additional Modeling																110					110	18,150	0	454	18,604	
C3.2	Additional Alternatives Development and Evaluation			12							8	16	30			40						106	20,880	0	522	21,402	
	Subtotal C | Alternatives Development and Evaluation	0	0	78	182	0	68	40	28	0	30	16	30	8	128	144	322	70	48	0	8	1,186	257,610	0	6,440	264,062	264,100
D	**Design Criteria and Implementation Plan**																										
D1	**Conceptual Design of Treatment Facilities**																										
D1.1	Design Criteria			8	4											8						20	4,800	0	120	4,920	
D1.2	Process Flow and Mass Balance Diagrams			12							12					16						40	9,400	0	236	9,636	
D1.3	Hydraulic Profiles			4						12						8						24	6,220	0	156	6,376	
D1.4	Facility Sizing			12			8				10					16						46	11,520	0	288	11,808	
D1.5	Narrative Descriptions			10	4		3					4										21	6,270	0	157	6,427	
D1.6	Preliminary Process and Major Equipment Selection			4			8				8					12						32	8,000	0	200	8,200	
D1.7	Technical Memorandum			12	4		6				2					24			16		6	72	13,690	0	341	13,991	
D2	**Conceptual Design of Collection and Conveyance Facilities**																										
D2.1	Design Criteria			4				6							2	12						24	5,320	0	133	5,453	
D2.2	Pump Stations - Capacity, Type, Preliminary Location, Narratives			8				2							6	4						20	4,460	0	112	4,572	
D2.3	Pipelines - Diameters, Preliminary Routing, Narratives			4				8							6	16						34	7,150	0	178	7,329	
D2.4	Technical Memorandum			12				6							16	4			16		4	58	10,670	0	267	10,937	
D3	**Environmental Compliance and Permit Requirements**																										0
D3.1	Review Existing Permit Conditions			2										4								6	1,270	8,400	32	9,702	
D3.2	Environmental Documentation and Permitting Requirements			2										4								6	1,270	18,500	32	19,802	
D3.3	Technical Memorandum			2		4								4					4			14	3,150	12,100	79	15,329	
D4	**Implementation Plan**																										
D4.1	Phasing Plan			10								4	4									18	4,650	0	116	4,766	
D4.2	Constructability Issues			8								12	12									32	7,460	0	187	7,647	
D4.3	Maintenance of Plan Operations Issues			6						6		6	6									28	7,550	0	189	7,739	
D4.4	Capital and O&M Costs			8						2		6	6			20		40				82	15,470	0	387	15,857	
D4.5	Implementation Plan and Schedule			16						2		6	6									30	7,930	0	198	8,128	
D4.6	Technical Memorandum			12								4	4			24			24		4	72	11,940	0	299	12,239	
	Subtotal D | Design Criteria and Implementation Plan	0	0	158	12	4	25	32	0	24	32	42	38	13	0	158	36	40	62	0	14	679	148,170	39,000	3,709	190,879	190,900
E	**Project Report**																										
E.1	Project Report			32	32	8	4	32	16	2		2	2			12			4	54	8	208	49,190	0	1,235	50,625	
	Subtotal E | Project Report	0	0	32	32	8	4	32	16	2	0	2	2	0	0	12	0	4	54	0	8	208	49,190	0	1,235	50,625	50,600
	TOTAL, hours	6	46	594	306	39	174	287	463	155	163	130	113	79	234	462	491	115	228	54	103	4,192					
	TOTAL, dollars																						961,755	75,000	43,002	1,079,557	1,079,600

July 17, 2018
Prepared by: C. Spangenberg/M. Cortez
Submitted by: K. Burton
Approved by: Paul A. Cook

ENGINEERING AND OPERATIONS COMMITTEE

REHABILITATION OF DYER ROAD WELLFIELD WELLS 10 AND 16
CONSULTANT SELECTION

SUMMARY:

Dyer Road Wellfield (DRWF) Wells 10 and 16 have experienced a reduction in production and specific capacity and need rehabilitation. Based on the District's current well rehabilitation matrix, the priority of wells needing rehabilitation next are Wells 14, 11, 12 and 4. Staff recommends that the Board authorize the General Manager to execute a Professional Services Agreement with Richard C. Slade & Associates, LLC in the amount of $249,391 for the rehabilitation of DRWF Wells 10 and 16 and two additional wells to be selected at a later date.

BACKGROUND:

To establish a priority of wells needing rehabilitation, staff maintains a matrix based on the operational performance and maintenance activities of the wells. Several wells from the matrix have been rehabilitated within the last five years: DRWF Wells 3, 5, 18, 7, 2 and 17, and Irvine Desalter Wells 107 and El Toro 1 and 2. At this time, DRWF Wells 10 and 16 require rehabilitation in order to improve their hydraulic performance. Neither well has been rehabilitated since the wells were put into service. A location map showing the wells is attached as Exhibit "A".

DRWF Well 10 was constructed in 1994 with copper bearing steel as the casing material. The specific capacity has decreased from 112 gallons per minute per foot of drawdown (gpm/ft-dd) to the current specific capacity of 30 gpm/ft-dd. The decrease in specific capacity can be attributed to heavy biological fouling and encrustation buildup within the gravel pack and casing as verified by a recent downhole video of the well. The original pumping rate was 5,000 gpm; the latest recorded pumping rate in 2017 was 2,600 gpm.

DRWF Well 16 was constructed in 1996; the casing material is copper bearing steel. Like DRWF Well 10, the specific capacity of Well 16 has decreased over time from the well's original specific capacity of 49 gpm/ft-dd to 12 gpm/ft-dd in 2017. Similar to Well 10, the decrease in specific capacity can be attributed to heavy biological fouling and encrustation buildup within the gravel pack as verified by a recent downhole video of the well. The original pumping rate was 2,400 gpm; the average flow rate for Well 16 dropped to 1,700 gpm in the past year.

The wells needing rehabilitation next include DRWF Wells 14, 11, 12 and 4; two of these wells will be selected for rehabilitation subsequent to the design completion of Wells 10 and 16 and pending discussions regarding the District's system operating needs.

Consultant Selection:

On May 8, 2018, staff issued a Request for Proposal for hydrogeologist services for the rehabilitation of DRWF Wells 10 and 16 on to four consultants: Brown and Caldwell, Richard C. Slade & Associates LLC (RCS), Thomas Harder & Co., and Wood Rogers, Inc. Proposals were received from RCS and Wood Rogers, Inc. on June 14. Brown and Caldwell and Thomas Harder & Co. notified the District that due to their current workloads and schedules, they would not be pursuing the project. Staff completed its evaluation of the two proposals received. Based upon the strong project team, extensive knowledge and experience of the Orange County Groundwater Basin and DRWF wells, staff recommends awarding a Professional Services Agreement to RCS in the amount of $249,391 to perform hydrogeological services for the rehabilitation of DRWF Wells 10 and 16, and two additional wells to be named at a later date. The consultant selection matrix is attached as Exhibit "B".

FISCAL IMPACTS:

DRWF Well 10 and Well 16 Rehabilitation, Projects 07087 and 07091, are included in the FY 2018-19 Capital Budget. The existing budgets are sufficient to fund the design and construction monitoring phases of the projects. The agreement provides sufficient funds for hydrogeologist services for the rehabilitation of two additional wells to be determined. A Notice to Proceed will be issued to the consultant for professional services required for Wells 10 and 16 only. Funds for the rehabilitation of the two additional wells will be released at a later date.

ENVIRONMENTAL COMPLIANCE:

This project is exempt from the California Environmental Quality Act (CEQA) as authorized under the California Code of Regulations, Title 14, Chapter 3, Section 15301 which provides exemption for minor alterations of existing public or private structures, facilities, mechanical equipment, or topographical features, involving negligible or no expansion of use beyond that existing at the time of the lead agency's determination. A Notice of Exemption for the project will be prepared and filed with the Orange County Clerk Recorder in July 2018.

RECOMMENDATION:

That the Board authorize the General Manager to execute a Professional Services Agreement with Richard C. Slade Associates LLC in the amount of $249,391 for rehabilitation of Dyer Road Wellfield Wells 10 and 16, Projects 07087 and 07091, and two additional wells to be selected at a later date.

LIST OF EXHIBITS:

Exhibit "A" – Location Map
Exhibit "B" – Consultant Selection Matrix
Exhibit "C" – RCS Scope of Work and Fee Proposal

EXHIBIT "A"

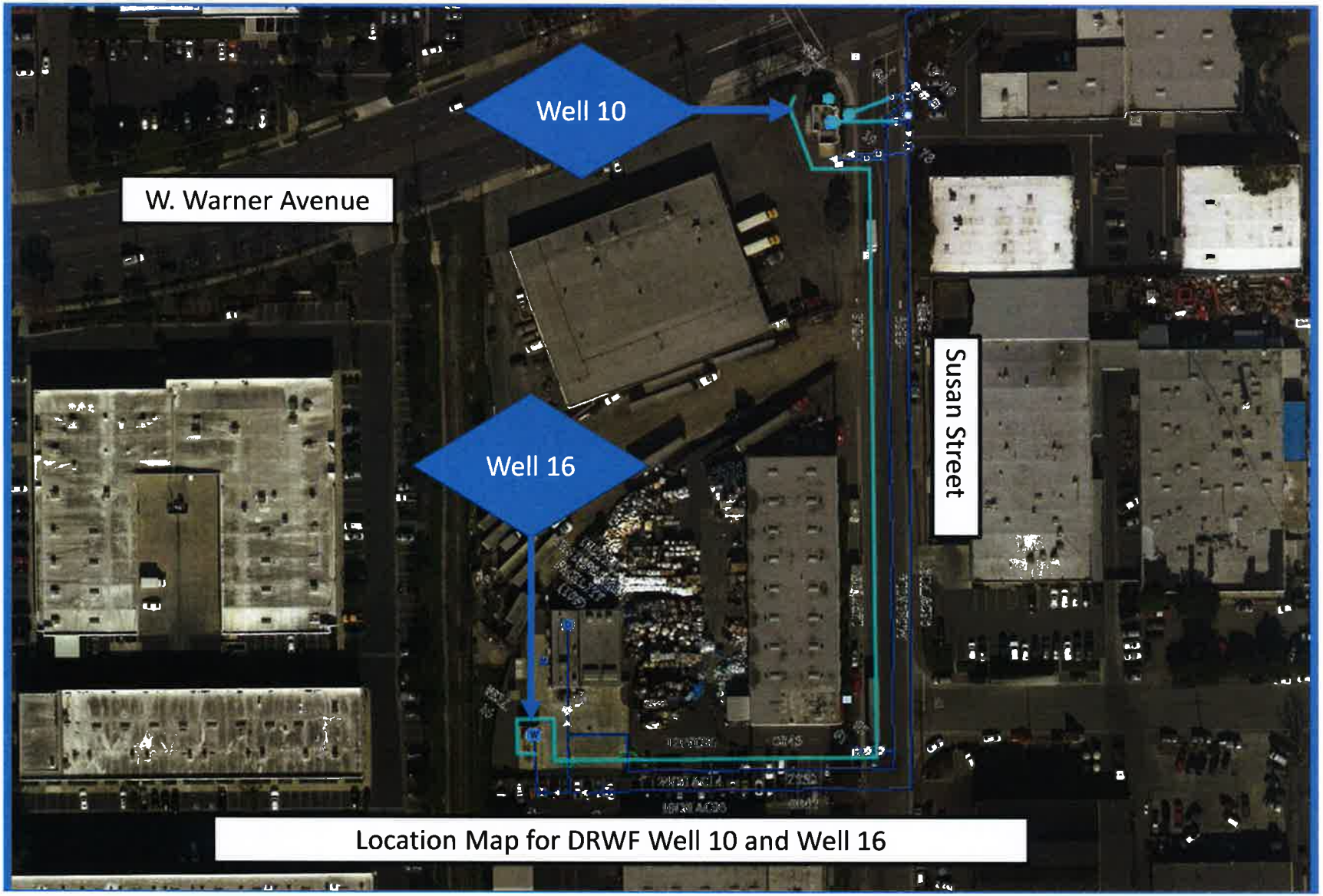

Well 10
W. Warner Avenue
Susan Street
Well 16
Location Map for DRWF Well 10 and Well 16

EXHIBIT "B"

CONSULTANT SELECTION MATRIX

DRWF Well 10 and Well 16 Rehabilitations

Item	Description	Weights	Richard C. Slade & Associates		Wood Rogers	
A	TECHNICAL APPROACH	**40%**				
1	Overall Project Understanding / Approach	40%	1		2	
2	Scope of Proposal	60%	1		2	
	Weighted Score (Technical Approach)		1.0		2.0	
B	QUALIFICATION AND EXPERIENCE	**60%**				
1	Firm/Team	60%	1		2	
2	Project Manager	40%	Earl LaPensee-30 Years	1	Joseph Kingsbury 18 years	2
	Weighted Score (Experience)		1.0		2.0	
	COMBINED WEIGHTED SCORE		1.0		2.0	
	Ranking of Consultants					
C	SCOPE OF WORK					
TASK	**Well 10**		Task Hours	FEE	Task Hours	FEE
1	Review Video Surveys, Information. Condition Report		34	$ 5,964	33	$ 5,757
2	Prepare Technical Specifications and Project Manual		25	$ 4,310	86	$ 15,302
3	Provide Bid Phase Support		8	$ 1,466	18	$ 2,481
4	Construction Phase Services and Project Management		205	$ 26,730	312	$ 44,801
5	Preparation of Summary Report		52	$ 8,992	76	$ 12,666
6	Miscellaneous Services*-Wood Rogers					$ 10,000
	Subtotal Well 10		324	$ 47,462	525	$ 91,006
	Well 16					
1	Review Video Surveys and Available		34	$ 5,964	33	$ 5,757
2	Prepare Technical Specifications and Project Manual		25	$ 4,310	86	$ 15,302
3	Provide Bid Phase Support		8	$ 1,466	18	$ 2,481
4	Construction Phase Services and Project		205	$ 26,730	316	$ 45,461
5	Preparation of Summary Reports		52	$ 8,992	76	$ 12,666
6	Miscellaneous Services*-Wood Rogers					$ 10,000
	Subtotal Well 16		324	$ 47,462	529	$ 91,666
7	Hydrogeologist Design/Construction Phase Services for Two		1057	$ 146,384	776	$ 128,385
	Communications Fee			$ 6,083		
Total			**1704**	**$ 249,391**	**1830**	**$ 311,057**
D	OTHER					
	Sub Consultants		In-House		In-House	
	Exceptions taken to IRWD Std. Contract		None		None	
	Insurance (Professional & General Liability)		None		None	

6/18/2018

RICHARD C. SLADE & ASSOCIATES LLC
CONSULTING GROUNDWATER GEOLOGISTS

June 12, 2018

Mr. Carl Spangenberg
Irvine Ranch Water District
P.O. Box 57000
Irvine, California 92619-2016

Job No. 382-OGE19

Re: Proposal for Hydrogeologic Services
Rehabilitation of Dyer Road Wellfield Well Nos. 10 and 16
Irvine Ranch Water District, California

Dear Mr. Spangenberg:

Richard C. Slade & Associates LLC, Consulting Groundwater Geologists (RCS), is pleased to submit this proposal for providing hydrogeologic office and field services for the rehabilitation of Irvine Ranch Water District (IRWD) Dyer Road Wellfield (DRWF) Well Nos. 10 and 16. As seen on Figure 1, "Well Location Map," both of these wells are located in the City of Santa Ana, Orange County, California. Appendix A of this proposal provides a statement of our qualifications and a summary of the various well rehabilitation, well construction, and well destruction projects for which RCS has provided groundwater services over the years on numerous municipal-supply wells in southern California and, more recently, for IRWD.

RCS has considerable experience in performing evaluations of existing municipal-supply wells and in providing office and field monitoring services during well rehabilitation operations. Indeed, our firm has evaluated, assisted in the preparation of Technical Specifications and Bid Documents, and provided field oversight services for rehabilitation of several other IRWD wells, including DRWF Well Nos. 2, 3, 5 and 7, 17 & 18 and Irvine Desalter Project (IDP) Well No. 107, Wells ET-1. Further, we also provided services for IRWD Well No. 52, with regard to the pumping redevelopment of that well in 2014 and again, more recently, in May 2018.

We trust that our experience in well rehabilitation activities, as documented herein in Appendix A, meets with your approval. We appreciate this opportunity to present our proposal for the rehabilitation of DRWF Well Nos. 10 & 16, and look forward to once again working with you and your staff on this groundwater-related project.

Respectfully submitted,
RICHARD C. SLADE & ASSOCIATES LLC

Richard C. Slade, President and
Principal Groundwater Geologist

14051 BURBANK BLVD., SUITE 300, SHERMAN OAKS, CALIFORNIA 91401
SOUTHERN CALIFORNIA: (818) 506-0418 • NORTHERN CALIFORNIA: (707) 963-3914
WWW.RCSLADE.COM

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UNDERSTANDING THE PROJECT AND APPROACH

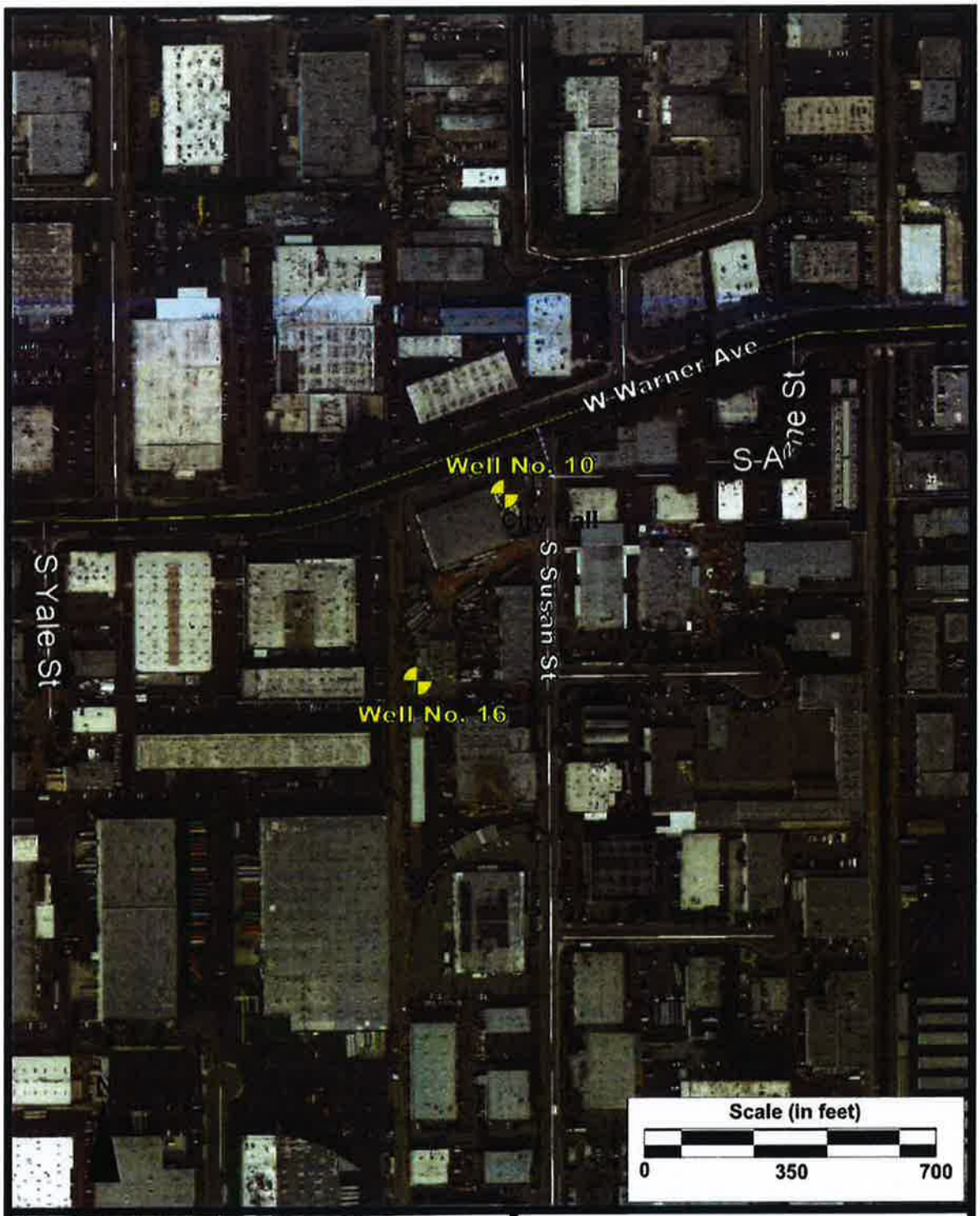
DRWF Well Nos. 10 and 16 were constructed in 1994 and 1998, respectively. Table 1, "Summary of Available Well Construction Data," provides the basic documented "as-built" construction parameters for each well. The wells were constructed to depths of 827 to 960 ft below ground surface (bgs), respectively, and perforations in each well consist of Roscoe Moss Company Ful-flo louvers with 0.050- to 0.055-inch slot widths, respectively.

The casings in these two wells are 20+ years old, and the casing walls and perforations have most likely become plugged and encrusted with significant amounts of biological growths. It is noted in the RFP that Well No. 10 was last rehabilitated in 2013 (although the exact rehabilitation methods are unknown), and that the specific capacity of this well has declined in the last few years. Specifically, the specific capacity of Well No. 10 has reportedly decreased from 70 gallons per minute per foot of drawdown (gpm/ft ddn) when the well was first constructed, to 30 gpm/ft ddn at a pumping rate of 2,500 gpm/ft ddn. Similarly, the specific capacity of Well No. 16 has reportedly decreased from 49 gpm/ft ddn at a pumping rate of 2,400 gpm when the well was first constructed in 1998, to 11 gpm/ft ddn at a pumping rate of 1,600 gpm in 2017. Thus, each well will likely need to undergo a complete suite of directed rehabilitation tasks that could encompass some or all of the following:

- Removal of the pumps and an initial video and Casing Inspection Thickness Measurement (CITM) surveys. The CITM is needed to check the current thickness of the casing walls. Based on the age of the wells, their casings are very likely either mild steel, or low carbon steel.
- Wire brushing and bailing of sediment fill.
- Mechanical redevelopment (AirBurst® or BoreBlast®, or similar method).
- Chemical treatment.
- Pumping redevelopment
- Step drawdown and constant rate production testing to determine the post-rehabilitation specific capacity.
- Dynamic flowmeter (spinner) and depth-specific sampling.
- Static spinner survey.
- Interim video surveys to check downwell conditions after selected rehabilitation tasks.

Currently, it is not anticipated that either well will require the installation of patches and/or casing liners. However, following initial cleaning and an initial video survey, it may be revealed that there could be holes in either well casing. As such, an assessment of whether swaged patches or casing liners will need to be installed will be made at that time.

The above basic tasks are needed to help increase the current specific capacity of each well. However, the degree to which this parameter will be improved is unknown; the results of the new constant rate testing will be compared to those from the original, post-construction pumping test in each well.



RICHARD C. SLADE & ASSOCIATES LLC
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FIGURE 1
WELL LOCATION MAP

Job No. 382-OGE19 June 2018

TABLE 1
SUMMARY OF AVAILABLE WELL CONSTRUCTION DATA
IRVINE RANCH WATER DISTRICT
DYER ROAD WELLFIELD WELL NOS. 10 AND 16

Well No.	Date Constructed & Driller	Method of Drilling	Conductor Casing Type, Diameter (In) & Depth (ft bgs)	Pilot Hole Depth (ft bgs)	Ream Diameter (in) & Depths (ft bgs)	Casing Type, Diameters (in) and Depths (ft bgs)	Accessory Tubes	Sanitary Seal Depth (ft bgs)	Type of Screen	Screen Intervals Per Driller (ft bgs)	Slot Size of Screen (in)	Total Length of Screen Per Driller (ft)	Gravel Pack Type, Gradation, & Interval (ft bgs)
10	September 1994 Beylik Drilling	Reverse Circulation	LCS 36" OD X 3/8" wall to 52'	1,040	26" to 960'	LCS (?) 20" OD (?) X 3/8" wall to 380' Reducer: 20" X 16" OD (?) X 3/8" wall 380' to 382' (?) 68" OD (?) X 5/16" to 960'	ND	Cement to 380"	Roscoe Moss Ful-flo Louvers	420 to 940	0.050	520	8 X 16 380' to 960'
16	August 1998 Bakersfield Well & Pump Company	Reverse Circulation	LCS 38" OD X 5/16" wall to 56'	1,010	48" to 56' 36" to 398' 26" to 860'	CBS 22" ID X 3/8" wall to 355' Reducer: 22" X 16" ID X 3/8" wall 355 to 358' 16" ID X 5/16" wall to 827'	4" Sounding to 350' 4" Gravel feed to 370'	10-sack cement slurry to 360'	Roscoe Moss Ful-flo Louvers	406 to 426 446 to 476 542 to 556 572 to 596 612 to 636 726 to 746 786 to 806	0.055	152	Colorado Silica 8 X 16 360' to 831' cement seal 831' to 860'

NOTES: LCS = Low Carbon Steel. Data from Well 10 from copy of State Well Completion Report, type of steel or outside/inside diameter not detailed.
CBS = Copper-bearing Steel
OD = Outside Diameter
ID = Inside Diameter
bgs = below ground surface

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SCOPE OF HYDROGEOLOGIC SERVICES

Our proposed Scope of Hydrogeologic Services described herein is based on our previous experience in the rehabilitation of wells with IRWD, which consequently has allowed RCS to develop, in conjunction with IRWD staff, an efficient and cost effective approach to conducting a technically-sound program for well rehabilitation.

Task 1 – Review Video Survey, Available Information, Field Investigation, Condition Assessment Report

Under this task, RCS will prepare for and attend an initial, "kick-off" meeting with IRWD Staff with regard to discussing the goals and parameters of the well rehabilitation project. Following review of available video surveys and data on the two wells, an individual report will be prepared with regard to our assessment of current downwell conditions in each well. These reports will generally contain the following:

- Well construction details.
- Results of initial pumping tests on the wells.
- Trends in historic and pumping water levels and specific capacities, based on available data.
- Results of our review of initial video surveys.
- Site logistics and possible equipment layout.
- Summary of water quality conditions.
- Conclusions and Preliminary Recommendations.

These reports will include our preliminary recommendations as to what future rehabilitation options might be implemented in each of those two wells, and these will be used as guidance for our subsequent preparation of the Technical Specifications for rehabilitation.

Task 2 – Prepare Technical Specifications

Based on review of the available well data, on the results of the site visits, and on our review of the new downwell surveys, RCS shall prepare the Project Manual (PM) for the two wells. This document will include the Technical Specifications and Line Item Bid Sheets for well rehabilitation operations for each well. Only one PM set will be prepared for the rehabilitation of two wells. The work can then be bid out by IRWD and performed under a single contract. It is anticipated that IRWD will provide RCS with its recent and updated copy of the pertinent sections of the PM, other than the Technical Provisions sections.

The Technical Specifications portion of the PM will generally include the following well rehabilitation elements:

1. Equipment to be utilized and size of work area needed.
2. The possible need for additional site security fencing.
3. The type of site preparation work needed at each site before the contractor mobilizes is equipment.

4. Sound/noise mitigation/security measures, if needed.
5. Video surveys to be performed during and following rehabilitation of the wells.
6. The depth intervals of well casing to be rehabilitated.
7. The type of mechanical well rehabilitation methods will be evaluated and included in the Technical Specifications, as needed. These methods could include the following:
   - Wire brushing & bailing.
   - CITM survey.
   - Dual-swab airlifting and surging.
   - "Air-Jetting", consisting of either the Airburst® or Bore Blast® methods.
8. The type of various chemicals and emplacement methods that might be needed during chemical rehabilitation. RCS has previously developed an effective chemical rehabilitation method for other IRWD wells using HercChemTec-formulated chemical mixes.
9. Discharge locations and treatment options/consideration for the discharge of all fluids generated from each well during all rehabilitation tasks.
10. Parameters for pumping development and final well tests.
11. Discharge requirements and NPDES permit compliance.
12. A bid item for repair/replacement of the permanent pump by the Contractor.

A line item estimate for the probable cost of the rehabilitation work will also be prepared for each well. This will be provided to IRWD to permit comparison of bids received. The Technical Specifications will be prepared to account for the rehabilitation of both wells under a single well rehabilitation contract. We assume that IRWD will be sending out the entire well rehabilitation package for competitive bidding. This task also includes a meeting between RCS and IRWD Staff to review and discuss the final PM.

Task 3 – Provide Bid Phase Support

RCS will provide bid phase support to IRWD. This support will consist of conducting a pre-bid meeting and the preparation of two bid addenda, as necessary. The purpose of the pre-bid meeting is to help potential bidders better understand site logistics such as access, available water supply, location of utilities, and fluids disposal options at each well site.

RCS will prepare for and attend a single pre-bid meeting for the two wells, provide pre-bid clarifications to the bidders and preparing the bid addenda, if necessary. We will also assist IRWD in the review and analysis of bids received. Also, prior to commencement of field activities, RCS will attend an initial pre-rehabilitation meeting with the Contractor (a single meeting for both wells). This will be to acquaint the Contractor selected by IRWD with the project goals and discuss final scheduling issues and lines of communication.

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Task 4 – Field Monitoring of Well Rehabilitation Operations (IRWD Construction Phase Services)

Once a contract has been awarded to the successful bidder by IRWD, RCS geologists will be available to provide field observation of Contractor activities at each well site. This observation is to provide the IRWD with a basic record of Contractor activities at the sites and to help document that the Contractor performed the work in compliance with the Technical Specifications. Tasks that RCS will perform during the rehabilitation project for the two wells could likely consist of the following:

- *Subtask 4.1: Pump Removal*. Observe the removal of the permanent pump from the two wells.
- *Subtask 4.2: Brushing and Bailing*. Observe the wire brushing of the two wells and removal of sediment fill via bailing. The RCS geologist will be present to measure the brush, to check if it is of the correct diameter, and observe the downwell brushing. It is anticipated, at this time, that two days of brushing and bailing will be performed in each well.
- *Subtask 4.3: Downwell Surveys*. Observe and initial video and CITM tool surveys in each of the two wells.
- *Subtask 4.4: "Air-Jetting"*. Observe Air-jetting" methods conducted by the Contractor, for each well. At the current time, it is anticipated that the AirBurst® or BoreBlast® methods will be utilized by the Contractors. An RCS geologist will be present onsite when the selected method is being performed.
- *Subtask 4.5: Chemical Treatment*. Performing chemical development of the well. This chemical development will involve the use of HerChemTec-formulated chemical mixtures to be injected into each well by the contractor selected by IRWD to perform the work. It is anticipated that chemical treatment will be initially performed using hydrogen peroxide to clean the casing and, thereby, render it visible for observation by video of any holes in the well. The onsite RCS geologist will record the volumes and types of chemicals used in the process and during use of a dual-swab tool for chemical emplacement.
- *Subtask 4.6: Swabbing & Airlifting*. Monitor dual swab airlifting and swabbing to removal the chemicals and to further help redevelop the wells.
- *Subtask 4.7: Pumping Redevelopment*. RCS will be present on a part-time basis, during startup and near the end of pumping development at each well. RCS will obtain the pumping development sheets from the pumper, on a daily basis (via FAX or email), during the development process.
- *Subtask 4.8: Pumping Tests*. Pumping tests will follow pumping redevelopment. This testing will consist of a 12-hour step drawdown test and a 24-hour constant rate pumping test. Near the end of testing, a dynamic spinner survey and depth specific sampling can be performed in each well. Thus, we are including time and costs for RCS field staff to be present for these end-of-test tasks.

Further, Title 22 water samples will be collected by the onsite field geologist who will then deliver the samples to the IRWD laboratory. In addition, RCS will temporarily equip each well with an RCS downwell pressure transducer to record changes in water levels during the pumping tests. Further, the onsite field geologist will measure specific field water quality parameters while onsite (temperature, electrical conductivity, pH, turbidity and other key field parameters, such as dissolved oxygen, DO, and the oxidation-reduction potential, ORP). RCS assumes that the Contractor will obtain a National Pollutant Discharge Elimination System (NPDES) permit and will collect samples for analysis and fulfill the reporting requirements of the permit. Near the end of pumping, a final dynamic spinner survey will be performed in each well by the Contractor to help determine if any changes in downwell flow regime have occurred, as a result of the recent rehabilitation work.

- *Subtask 4.9: Final Video and Static Spinner Surveys and Well Disinfection.* Following test pump removal, a final video and static spinner survey of each rehabilitated well will be performed by the Contractor to help document the final post-rehabilitation condition of the wells. An RCS field geologist will be present at each well to observe these final surveys.

Task 5 – Preparation of Summary of Report

Prepare a separate Summary of Well Rehabilitation Operations report for each of the rehabilitated wells to help document rehabilitation operations performed on the wells. Each report will discuss rehabilitation operations and summarize our observations regarding the actual rehabilitation work performed on each well. Final recommendations regarding new production rates will also be provided in the report. This report will consist of the following:

- A basic chronology of well rehabilitation operations.
- A description of each method used and the results of those methods.
- Daily field reports by the onsite field geologist.
- An evaluation/analysis of the final pumping tests in each well and an assessment of new pumping capacities and specific capacities.
- Recommendations for the pump depth setting and pumping rate for the permanent pump in each well.
- Discussion of the water quality conditions based on the final Title 22 sampling results.
- Photographs to help document selected rehabilitation methods.
- Supporting documentation on well rehabilitation operations, including the types and volumes of chemicals, the Contractor's daily records, pumping development and testing sheets, and laboratory results of the testing of water samples, and/or bacteriological samples, and/or scale samples.
- The reports will also have attendant tables, figures and drawings to help document work conducted on the two wells.

A Draft report will be submitted to the IRWD Staff for their review and comment. Following that review, IRWD comments will be incorporated and five (5) bound copies of the Final report along

with an electronic copy in an Adobe PDF file (On CD) of the document will be submitted to IRWD.

Task 6 – Hydrogeologist "Design and Construction" Phase Services for Two Additional Wells

RCS will perform similar rehabilitation services for two other water-supply wells to be determined at a later date by IRWD Staff. For the purposes of this proposal, it is assumed that the same level of services described herein for Well Nos. 10 and 16 will be performed on these two additional wells. However, it should be noted that if the two additional wells might need other work, such as installation of patches and/or casing liners, then RCS reserves the opportunity to provide extra costs to IRWD at that time for our field-related services during patch/liner installation.

RFP ITEMS UNDER "PROPOSAL CONTENTS"

RFP Item No. 1: Scope

The Scope of Services proposed to be provided by RCS on this project is described in the previous section.

RFP Item Nos. 2 & 3: RCS Company and Its Experience

RCS has provided similar rehabilitation services as those required herein on at least 50 other municipal-supply water wells in southern California over the past several decades. A relatively recent (last 5 years) listing of similar types of projects is provided in Appendix A.

RPF Item No. 4: Budget

An analysis of the estimated man-hours and costs, arranged by task and subtask, is provided in the Fee Proposal, which is submitted under separate cover per IRWD request.

RFP Item No. 5: Joint Venture

Office and field monitoring of contractors performed on this project will be conducted solely by RCS geologists. There is no joint venture associated with this project.

RFP Item No. 6: Conflict of Interest

The firm of RCS does not current have any conflict of interest associated with IRWD or any other firm that may be contracted with IRWD for work on this project.

RFP Item No. 7: Insurance

RCS carries both general and professional liability (errors and omissions) in the amount of $1,000,000, each. Proof of these limits will be provided to IRWD when needed.

RFP Item No. 8: Contract

RCS has reviewed IRWD's Agreement for Professional Services contract and takes no exceptions to it.

RFP Item No. 9: Public Work Requirements

It is understood that if the "Engineer" or any tiered level of its subconsultant(s) or subcontractor(s) performs work on the project, including but not limited to "geotechnical,

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surveying or inspection work" or any other work determined by the California Department of Industrial Relations (DIR) to constitute "public work," then the Engineer and its subconsultant(s) and subcontractor(s) must be registered with the DIR.

However, review of Senate Bill 854, which was enacted in June 2014, and other online information from the Department of Industrial Relations, with regard to Public Works Projects, reveals that there are no provisions for consultants on such projects. Rather, the regulations appear to apply solely to contractors and subcontractors that perform the actual construction activities.

As such, RCS is a consultant employing degreed and licensed geologists and professional groundwater geologists, who will not be involved directly with or assist in any construction activities, and will not employ any subcontractors to perform any work at the site. Further, as such, RCS does not use inspectors but, rather, licensed geologists to perform field monitoring of contractor activities, which is strictly observational in scope. RCS will observe and monitor the work with regard to compliance to the Technical Specifications for the project.

APPENDIX A
RCS QUALIFICATIONS

RCS COMPANY BACKGROUND

Mr. Richard C. Slade has over 51 years of hydrogeologic experience in California, the last 35 of which have been as Principal Hydrogeologist and owner of Richard C. Slade & Associates LLC (RCS), Consulting Groundwater Geologists. Mr. Slade maintains licenses as a Registered Geologist and Certified Engineering Geologist in California. The RCS firm has seven full-time professional groundwater geologists including:

- Two senior project-level hydrogeologists, Mr. Earl LaPensee and Mr. Anthony Hicke. Both are licensed Professional Geologists and Certified Hydrogeologists in California. Mr. LaPensee has been with RCS since 1989, whereas Mr. Anthony Hicke has been with RCS since 2001.
- Four staff/field-level geologists (Mssrs. Chris Wick, Joe Amar, Sean Fulcher, and Geza Demeter) to provide as-needed field and office support services on groundwater projects. All four are degreed geologists; Mr. Wick and Mr. Amar have been with RCS for approximately 10 years and 5 years, respectively, while Mr. Fulcher and Mr. Demeter started with the firm in 2017. Messrs Wick, Amar, Fulcher, and Demeter are all licensed Professional Geologists.

Specific areas of expertise for RCS include:

- groundwater basin evaluations and basin management and water well feasibility studies;
- characterizing the water-bearing sediments and the base of fresh water in groundwater basins;
- conducting detailed studies of groundwater conditions in adjudicated and unadjudicated groundwater basins;
- preparing groundwater monitoring plans;
- conducting siting, specifying, designing and testing of new water wells for both municipal-supply and agricultural-supply;
- conducting analysis and correlations of the resistivity signatures on geophysical electric logs available from water wells, oil wells, and groundwater monitoring wells;
- providing independent, detailed E-log correlation networks and cross sections based on key marker beds;
- preparing Technical Specifications and detailed line item bid sheets for the preliminary design and cost analysis of new wells and monitoring wells;
- providing experienced geologists to field monitor the drilling, final design, construction and testing of new water wells and groundwater monitoring wells;
- conducting pumping tests and providing technical analyses of pumping test data
- evaluating groundwater contamination;
- assessing groundwater quality in individual wells and on a basin-wide basis;
- evaluating and monitoring of the rehabilitation of older wells;
- providing independent reviews of technical reports prepared by others; and
- providing expert witness services in hydrogeology.

Typical clients have included city water departments, county water agencies, water districts, various engineering firms, environmental and water rights attorneys, and numerous wineries and vineyards.

TYPICAL RCS HYDROGEOLOGIC SERVICES FOR MUNICIPAL-SUPPLY WATER WELLS

The firm of Richard C. Slade and Associates LLC, Consulting Groundwater Geologists, has been retained by a large number of water agencies, cities, water districts and private water companies to develop their local groundwater resources; a number of these clients lie within the Central and West Coast basins. The types of services provided to these agencies have depended on the needs of the client but have tended to include such tasks as:

New Wells

Hydrogeologic Evaluation and Well Siting

- Research of published geologic maps and reports;
- Evaluate site geology and watershed conditions;
- Evaluate surface and subsurface geologic conditions;
- Identify groundwater flow directions;
- Perform site reconnaissance visits;
- Review driller's logs and casing records;
- Evaluate and correlate electric logs from well to well;
- Monitor water levels in wells;
- Assess potential water quality problems;
- Monitor field water quality parameters in existing wells;
- Conduct pumping (aquifer) tests in wells;
- Evaluate potential water level drawdown interference between pumping wells;
- Review down-hole videos of wells;
- Evaluate water quality in onsite and offsite wells;
- Locate nearby offsite wells;
- Determine feasibility of siting and constructing new water wells;
- Determine the feasibility of rehabilitating or destroying existing wells;
- Prepare preliminary design reports with conclusions and recommendations regarding feasibility of developing local groundwater supplies.
- Prepare for and make verbal or written presentations to City Councils, County Planning Commissions and/or Boards of Supervisors

Prepare Technical Specifications

- identify the location and depth for new onsite wells;
- assess site logistics for well construction;
- determine drilling methodology;
- evaluate conditions for discharge of fluids under NPDES permit regulations;
- prepare detailed technical specifications and line item estimates of the probable cost for drilling and constructing new wells;
- assist in bidding process.

Field Monitoring Services

- geologically log drill cuttings from pilot hole;
- evaluate the electric log of the pilot hole;
- select depth zones and monitor aquifer zone isolation testing for water quality in selected aquifers
- provide final recommendations for placement of all well casing, perforations, gravel pack and cement seals;
- monitor installation of the recommended casing, gravel pack, and cement seal;
- monitor well development by mechanical and pumping methods;
- conduct pumping (aquifer) tests;
- monitor water levels and utilize water level pressure transducers;
- identify sampling/laboratory protocol for groundwater sampling;
- monitor spinner log survey and depth discrete-sampling
- determine water quality parameters to test for in the laboratory;
- recommend pumping rate & depth setting for permanent pump;
- provide a final report to document well construction & testing activities.

Existing Wells

Well Evaluation for Rehabilitation/Destruction

- review driller's logs and previous well rehabilitation;
- review and analysis of water level, water quality and operational pumping data;
- view and assess downwell conditions via video surveys;
- perform site visit to assess onsite conditions for well rehabilitation/destruction equipment
- identify down-hole well problems and develop guidelines for rehabilitating existing wells;
- prepare recommendations for well rehabilitation/destruction.

Technical Specifications/Guidelines

- determine preliminary well rehabilitation/destruction tasks and options;
- evaluate conditions for discharge of fluids under NPDES permit regulations;
- prepare detailed technical specifications and line item estimates of the probable cost for rehabilitation/destruction of wells;
- assist in the bidding process.

Field Monitoring Services

- monitor/observe removal of pump;
- perform sampling of scale/biofilm on pump column and casing and submit to laboratory for scale identifications and speciation of biological growth;
- observe downwell video surveys and evaluate;
- recommend changes to preliminary well rehabilitation/destruction tasks based on video survey findings;
- observe contractor operations during well rehabilitation/destruction\
- prepare summary reports documenting well rehabilitation/destruction work on wells.

RCS KEY STAFF/PROJECT TEAM

Richard C. Slade, PG, CEG, will serve as an overall project manager and lead for any groundwater projects. Slade is President and Principal Groundwater Geologist for Richard C. Slade & Associates LLC, Consulting Groundwater Geologist (RCS). RCS was founded by Mr. Slade in 1983 and the company has operated out of offices in the San Fernando Valley since that time. Mr. Slade has 47 years of groundwater experience in Southern California and has lived and/or worked in the San Fernando Valley as a groundwater geologist for his entire professional career. Mr. Slade has a BS and an MS degree in Geology from UCLA and USC, respectively, and maintains a professional license in geology in California. Mr. Slade has either conducted and/or managed/supervised more than 700 groundwater projects in a large number of groundwater basins throughout California, including virtually every recognized groundwater basin in Southern California that has active water wells. In December 2008, RCS was selected by the Superior Court to be the Watermaster for the Upper Los Angeles River Area (ULARA).

Earl LaPensee, PG, CHg, has been with RCS since 1989 and is Senior Groundwater Geologist and Project Manager. Since that time, Mr. LaPensee has conducted a large number of diverse groundwater projects including; the siting, design, construction monitoring and aquifer testing of over 300 municipal-supply and irrigation water wells; analyses of aquifer systems in numerous groundwater basins (involving the definition of geologic/hydrogeologic conditions, water level and water quality conditions, groundwater underflow, calculation of groundwater in storage and changes in storage). A primary focus in these projects has been on the characterization of aquifer systems (determination of physical parameters such as transmissivity and storativity) and spatial delineation of natural groundwater chemistry (especially with regard to trace element concentrations) and contaminant chemistry, evaluation of water level trends over time, definition of groundwater flow directions, and the use and correlation of geophysical electric logs from water wells and oil wells to help define aquifer continuity and extent.

Anthony Hicke, PG, CHg, began working with RCS in 2001, and is now a Senior Groundwater Geologist and Project Manager with the company. While at RCS, Mr. Hicke has participated in a number of basin-wide groundwater studies, in which tasks have included: review and analysis of geologic references and extensive electronic geologic databases; analysis of long-term water level data and their relation to precipitation data; review and analysis of water quality data; pumping data analysis, including the analysis of rates and volumes; and performing groundwater in storage calculations. In addition to his hydrogeologic work, Mr. Hicke functions as the in-house information technology manager. For previous basin study projects, Mr. Hicke has managed an FTP-based repository for electronic data transfer, and managed multiple large databases of water level data, geologic data, and GIS data. Further, Mr. Hicke has many years' experience with the MapInfo GIS software package, and is skilled at creating maps using GIS software, and facilitating the exchange of GIS data with clients.

FEE PROPOSAL
FOR HYDROGEOLOGIC SERVICES
DYER ROAD WELLFIELD WELL NOS. 10 & 16
IRVINE RANCH WATER DISTRICT

This Fee Proposal provides an estimate of consulting costs prepared by Richard C. Slade & Associates LLC, Consulting Groundwater Geologists (RCS), for field and office services with regard to rehabilitation of Irvine Ranch Water District (IRWD) Dyer Road Wellfield (DRWF) Well Nos. 10 & 16, each in the City of Santa Ana, Orange County, California.

COST ESTIMATE FOR HYDROGEOLOGIC SERVICES

Attached Table F1 provides details of the RCS's costs for each of the tasks listed in our Scope of Services, whereas Tables F2 through F4 show the costs separately for Task 4 for each of the wells and for the two additional wells suggested by IRWD.

Task	Description	Estimated RCS Costs
Task 1	Review Video Survey, Available Information, Field Investigation, Condition Assessment Report	$11,928
Task 2	Prepare Technical Specifications	$8,620
Task 3	Provide Bid Phase Support	$2,932
Task 4	Field Monitoring of Well Rehabilitation Operations (IRWD Construction Phase Services)	$53,460
Task 5	Preparation of Summary Report	$17,984
Task 6	Hydrogeologist Design and Construction Phase Services for Two Additional Wells	$148,384
	RCS Subtotal Professional Services:	**$243,308**
	2.5% Communications Fee:	**$6,083**
	RCS Total Professional Services:	**$249,391**

Our services will be billed on a time-and materials basis, with the total estimated cost representing a not-to-exceed limit within the limits of our assumptions presented below. RCS and its geologists are committed to this project. RCS is a small company and our professional staff of seven degreed and licensed geologists are all experienced groundwater geologists. Our estimated fees are realistic and well considered, and are based on our long-term experience in providing the same types of services required for your project.

Our cost estimate for the above scope of work is virtually entirely dependent on third-party contractor operations for rehabilitation of the three wells. Indeed, past experience on IRWD well rehabilitation projects have shown that there have been significant delays by the Contractors on each well, requiring our field personnel to be onsite much longer than anticipated.

As you will note, we are using our current Schedule of Charges dated November 2017 for all of our personnel on this project. **Nonetheless, RCS is willing to negotiate the hourly rates and final costs presented herein for this entire project.**

Invoices for the project will be submitted to IRWD on a monthly basis for review and processing. In addition to this invoice, a monthly status update report will be included outlining the work conducted to date and the percentage of the budget expended.

Key Assumptions & Contingencies for Well Rehabilitation

The cost estimate is based on the following key assumptions for third-party operations:

1. The costs assume and reflect that rehabilitation of the two wells are to be performed sequentially. RCS will only be present at the full-time or part-time basis listed herein when actual rehabilitation work is being performed (i.e., not, for example, during setup or removal of the Contractor's equipment). Thus, RCS will keep in telephone or email communication with the Contractor during work on each well.
2. It is anticipated that the Contractor will apply for and obtain a National Pollutant Discharge Elimination System (NPDES) permit for discharges to the local storm drain system at each site. In addition, it is expected that the Contractor will provide for a laboratory, deliver the samples for laboratory analysis, and fulfill the monitoring and reporting requirements of the NPDES permit. RCS will assist the Contractor with the field sampling and monitoring.

Payment will be based on the hours worked and the hourly rates as described in the attached Tables F1 through F4, which lists the man-hour breakdown each listed task. Because the actual number of hours required to complete the different tasks for well rehabilitation are outside the direct control of RCS, we recommend that all field monitoring services be performed on a time and expense basis, and that if the periods required to complete these tasks are expected to exceed our estimates once well rehabilitation operations are underway, RCS will notify your office in a timely fashion.

SCHEDULE OF CHARGES
November 2017

Professional Services	**Hourly Rates**
Principal Groundwater Geologist	$284.00
Senior Groundwater Geologist	$206.00
Staff Groundwater Geologist	$166.00
Field Geologist/Geologic Logging	$120.00
Clerical, Graphics and GIS Work	$ 88.00
Field Equipment Charges	
Pressure Transducers (water level & barometric pressure monitoring during pumping tests)	$ 50.00/wk
Electric Tape Water Level Probe	$ 25.00/day
Field Water Quality Probe (T, pH, EC)	$ 50.00/day

Litigation, Depositions and Testimony
Depositions and trial testimony are charged at twice the hourly rate (4-hour minimum/day).

Travel Time and Mileage
Travel time for meetings and/or to job sites will be charged at our standard hourly rates. Mileage is charged at the rate of $0.545 per mile as of January 2018.

Communications Fee
In-house costs for phone, e-mail, fax, regular postage, printing, copying, binding, and records retention, unless otherwise provided for in our project proposal Scope of Services.
Communications Fee = total project labor charges multiplied by 2.5%.

Outside Services
All services not ordinarily furnished by RCS, including subcontracted services (i.e., water quality laboratory testing), delivery services, reproduction and printing, etc., are billed at cost + 15%. Reproduction costs for large format printing, and/or high volume reproduction and binding of hard copy reports performed in-house by RCS staff, will be billed at rates similar to comparable outside services.

Conditions
RCS reserves the right to update this Schedule of Charges on November 1 of each year (the beginning of our Fiscal Year). Invoices are issued at our option on a monthly basis or when the work is completed. A service charge of 1½ % will be payable on any amount not paid within 30 days. Any attorney fees or other costs incurred in collecting delinquent charges shall be paid by the client.

Client will furnish rights-of-way to land as required for field visits and field operations, such as sampling or testing of water wells.

TABLE F1
RCS MAN-HOUR AND COST ESTIMATE DETAIL
REHABILITATION OF IRWD DRWF WELL NOS. 10 & 16 AND TWO ADDITIONAL WELLS
JUNE 2018

TASK LISTING	PRINCIPAL GROUNDWATER GEOLOGIST		SENIOR GROUNDWATER GEOLOGIST		STAFF GROUNDWATER GEOLOGIST		FIELD GROUNDWATER GEOLOGIST		CLERICAL PERSONNEL		TOTAL MAN-HOURS	TOTAL TASK COST
	BILLING RATES, HOURS AND COSTS											
	$284		$206		$166		$120		$88			
	HOURS	COST	HOURS	COST	HOURS	COST	HOURS	COST	HOURS	COST		
TASK 1 Review Video Surveys, Available Information, Field Investigation, Condition Assessment Report	4	$1,136	12	$2,472	48	$7,968	0	$0	4	$352	68	$11,928
TASK 2 Prepare Technical Specifications	2	$568	6	$1,236	40	$6,640	0	$0	2	$176	50	$8,620
TASK 3 Provide Bid Phase Support	1	$284	12	$2,472	0	$0	0	$0	2	$176	15	$2,932
TASK 4 Construction Phase Services												
Well No. 10 Field Costs (See Table 2 for Man-hour Details)	3	$852	13	$2,678	12	$1,992	176	$21,120	1	$88	205	$26,730
Well No. 16 Field Costs (See Table 3 for Man-hour Details)	3	$852	13	$2,678	12	$1,992	176	$21,120	1	$88	205	$26,730
SUBTOTAL TASK 4>>>	6	$1,704	26	$5,356	24	$3,984	352	$42,240	2	$176	410	$53,460
TASK 5 Preparation of Summary Reports	6	$1,704	12	$2,472	80	$13,280	0	$0	6	$528	104	$17,984
TASK 6 Hydrogeologist Design and Construction Phase Services for Two Additional Wells	25	$7,100	94	$19,364	216	$35,856	704	$84,480	18	$1,584	1,057	$148,384
										SUBTOTAL ESTIMATED COSTS FOR RCS SERVICES:		$243,308
										2.5% COMMUNICATIONS FEE:		$6,083
										TOTAL ESTIMATED COSTS FOR RCS SERVICES:		$249,391

TABLE F2
RCS MAN-HOUR AND COST ESTIMATE DETAIL
TASK 4 FIELD SERVICES FOR IRWD DRWF WELL NO. 10 REHABILITATION
JUNE 2018

TASK 4 SUBTASK LISTING		PRINCIPAL GROUNDWATER GEOLOGIST		SENIOR GROUNDWATER GEOLOGIST		STAFF GROUNDWATER GEOLOGIST		FIELD GROUNDWATER GEOLOGIST		CLERICAL PERSONNEL		TOTAL MAN-HOURS	TOTAL SUBTASK COST
		BILLING RATES, HOURS AND COSTS											
		$284		$206		$166		$120		$88			
		HOURS	COST	HOURS	COST	HOURS	COST	HOURS	COST	HOURS	COST		
TASK 4	Field Monitoring of Rehabilitation Operations												
Subtask 4.1	Pump Removal	0	$0	1	$206	1	$166	16	$1,920	1	$88	19	**$2,380**
Subtask 4.2	Brushing and Bailing	0	$0	1	$206	1	$166	12	$1,440	0	$0	14	**$1,812**
Subtask 4.3	Downwell Surveys (CITM, Initial & Interim Video Surveys)	0	$0	1	$206	1	$166	24	$2,880	0	$0	26	**$3,252**
Subtask 4.4	"Air-Jetting"	0	$0	1	$206	1	$166	12	$1,440	0	$0	14	**$1,812**
Subtask 4.5	Chemical Treatment	1	$284	1	$206	2	$332	32	$3,840	0	$0	36	**$4,662**
Subtask 4.6	Swabbing & Airlifting	1	$284	2	$412	1	$166	32	$3,840	0	$0	36	**$4,702**
Subtask 4.7	Pumping Redevelopment	0	$0	2	$412	1	$166	12	$1,440	0	$0	15	**$2,018**
Subtask 4.8	Pumping Tests	0	$0	2	$412	2	$332	24	$2,880	0	$0	28	**$3,624**
Subtask 4.9	Final Video & Static Spinner Surveys & Well Disinfection	1	$284	2	$412	2	$332	12	$1,440	0	$0	17	**$2,468**
	Task 4 Subtotals:	3	$852	13	$2,678	12	$1,992	176	$21,120	1	$88	205	**$26,730**
												ESTIMATED COSTS FOR RCS SERVICES, DRWF WELL NO	**$26,730**

TABLE F3
RCS MAN-HOUR AND COST ESTIMATE DETAIL
TASK 4 FIELD SERVICES FOR IRWD DRWF WELL NO. 16 REHABILITATION
JUNE 2018

TASK 4 SUBTASK LISTING		PRINCIPAL GROUNDWATER GEOLOGIST		SENIOR GROUNDWATER GEOLOGIST		STAFF GROUNDWATER GEOLOGIST		FIELD GROUNDWATER GEOLOGIST		CLERICAL PERSONNEL		TOTAL MAN-HOURS	TOTAL SUBTASK COST
		BILLING RATES, HOURS AND COSTS											
		$284		$206		$166		$120		$88			
		HOURS	COST	HOURS	COST	HOURS	COST	HOURS	COST	HOURS	COST		
Subtask 4.1	Pump Removal	0	$0	1	$206	1	$166	16	$1,920	1	$88	19	$2,380
Subtask 4.2	Brushing and Bailing	0	$0	1	$206	1	$166	12	$1,440	0	$0	14	$1,812
Subtask 4.3	Downwell Surveys (CITM, Initial & Interim Video Surveys)	0	$0	1	$206	1	$166	24	$2,880	0	$0	26	$3,252
Subtask 4.4	"Air-Jetting"	0	$0	1	$206	1	$166	12	$1,440	0	$0	14	$1,812
Subtask 4.5	Chemical Treatment	1	$284	1	$206	2	$332	32	$3,840	0	$0	36	$4,662
Subtask 4.6	Swabbing & Airlifting	1	$284	2	$412	1	$166	32	$3,840	0	$0	36	$4,702
Subtask 4.7	Pumping Redevelopment	0	$0	2	$412	1	$166	12	$1,440	0	$0	15	$2,018
Subtask 4.8	Pumping Tests	0	$0	2	$412	2	$332	24	$2,880	0	$0	28	$3,624
Subtask 4.9	Final Video & Static Spinner Surveys & Well Disinfection	1	$284	2	$412	2	$332	12	$1,440	0	$0	17	$2,468
	Task 4 Subtotals:	3	$852	13	$2,678	12	$1,992	176	$21,120	1	$88	205	$26,730
												ESTIMATED COSTS FOR RCS SERVICES, DRWF WELL NO.	$26,730

TABLE F4
RCS MAN-HOUR AND COST ESTIMATE DETAIL
TASK 4 FIELD SERVICES FOR TWO ADDITIONAL IRWD WELL REHABILITATIONS
JUNE 2018

TASK 4 SUBTASK LISTING	PRINCIPAL GROUNDWATER GEOLOGIST		SENIOR GROUNDWATER GEOLOGIST		STAFF GROUNDWATER GEOLOGIST		FIELD GROUNDWATER GEOLOGIST		CLERICAL PERSONNEL		TOTAL MAN-HOURS	TOTAL SUBTASK COST
	BILLING RATES, HOURS AND COSTS											
	$284		$206		$166		$120		$88			
	HOURS	COST	HOURS	COST	HOURS	COST	HOURS	COST	HOURS	COST		
Subtask 4.1 Pump Removal	0	$0	2	$412	2	$332	32	$3,840	2	$176	38	$4,760
Subtask 4.2 Brushing and Bailing	0	$0	2	$412	2	$332	24	$2,880	0	$0	28	$3,624
Subtask 4.3 Downwell Surveys (CITM, Initial & Interim Video Surveys)	0	$0	2	$412	2	$332	48	$5,760	0	$0	52	$6,504
Subtask 4.4 "Air-Jetting"	0	$0	2	$412	2	$332	24	$2,880	0	$0	28	$3,624
Subtask 4.5 Chemical Treatment	2	$568	2	$412	4	$664	64	$7,680	0	$0	72	$9,324
Subtask 4.6 Swabbing & Airlifting	2	$568	4	$824	2	$332	64	$7,680	0	$0	72	$9,404
Subtask 4.7 Pumping Redevelopment	0	$0	4	$824	2	$332	24	$2,880	0	$0	30	$4,036
Subtask 4.8 Pumping Tests	0	$0	4	$824	4	$664	48	$5,760	0	$0	56	$7,248
Subtask 4.9 Final Video & Static Spinner Surveys & Well Disinfection	2	$568	4	$824	4	$664	24	$2,880	0	$0	34	$4,936
Task 4 Subtotals:	6	$1,704	26	$5,356	24	$3,984	352	$42,240	2	$176	410	$53,460
											ESTIMATED COSTS FOR RCS SERVICES, DRWF WELL NO.	$53,460

July 17, 2018
Prepared by: C. Kessler/K. Lew
Submitted by: K. Burton
Approved by: Paul A. Cook

ENGINEERING AND OPERATIONS COMMITTEE

REIMBURSEMENT AGREEMENTS BETWEEN IRWD AND THE CITY OF IRVINE FOR THE ANNUAL SLURRY SEAL AND PAVEMENT REHABILITATION PROJECT AND THE CULVER DRIVE AND UNIVERSITY DRIVE INTERSECTION IMPROVEMENTS

SUMMARY:

The City of Irvine (City) is proceeding with its annual slurry seal and pavement rehabilitation project and the Culver Drive and University Drive Intersection Improvements project. These projects require individual Reimbursement Agreements (RAs) since the estimated construction cost for each project is over $100,000. Staff recommends that the Board:

- Authorize the General Manager to execute an RA with the City for the Annual Slurry Seal and Pavement Rehabilitation project, and
- Authorize the General Manager to execute an RA with the City for the Culver Drive and University Drive Intersection Improvements project.

BACKGROUND:

IRWD has had an RA in place with the City since 1995 for managing various street rehabilitation projects. Typically included in the City's Capital Improvement projects are alternate bid items for raising existing IRWD sewer manhole covers, sewer cleanouts, and water valve frames and lids to the new pavement grade. Any project up to $100,000 in reimbursable costs can be authorized by the General Manager as an addendum to this "umbrella" RA.

IRWD and the City have also agreed that any City street improvement project that involves the construction, modification or relocation of IRWD facilities with an estimated construction cost over $100,000 will be administered through a separate RA. The City's Annual Slurry Seal and Street Rehabilitation project has an estimated construction cost of $962,200 and the Culver Drive and University Drive Intersection project has an estimated construction cost of $262,000. Therefore, both of these projects require a project-specific RA.

Annual Slurry Seal and Street Rehabilitation Project:

This project focuses on the Irvine village of Northwood. Approximately 673 domestic and 43 recycled water valve frames and lids, 121 sewer cleanouts, and 295 sewer manholes will be installed or adjusted to new pavement grade. A Vicinity Map is attached as Exhibit "A", the Engineer's Estimate as Exhibit "B", and the RA as Exhibit "C". The RA has been reviewed by IRWD's legal counsel.

Culver Drive and University Drive Intersection Improvements Project:

This project involves the widening of the intersection resulting in impacts to IRWD's facilities. Approximately seven water valve frames and lids and two sewer manholes will be installed or adjusted to new pavement grade. In addition, one backflow assembly, two vault vents, one domestic water meter, one fire hydrant, one cathodic protection test station, one blowoff assembly, and two gate valves will be removed and relocated. The City received six bids and recommends awarding the project to the low bidder for the City's portion of the work, Beador Construction Company. The bids for IRWD's portion of the work ranged from $102,621 to $262,000. Although Beador Construction Company's bid of $262,000 for IRWD's portion of the work was the highest, the overall cost is reasonable considering the complexity of working in a busy intersection and the extensive traffic control that is required. A Vicinity Map is attached as Exhibit "D", the Bid Summary as Exhibit "E", and the RA as Exhibit "F". The RA has been reviewed by IRWD's legal counsel.

FISCAL IMPACTS:

Projects 07128, 07130, and 07132 are included in the FY 2018-19 Capital Budget and have adequate budgets to fund these projects.

ENVIRONMENTAL COMPLIANCE:

Annual Slurry Seal and Street Rehabilitation Project:

This project is exempt from the California Environmental Quality Act (CEQA) as authorized under the California Code of Regulations, Title 14, Chapter 3, Section 15061 (b) (3). The activity is covered by the general rule that CEQA applies only to projects which have the potential for causing a significant effect on the environment. Where it can be seen with certainty that there is no possibility that the activity in question may have a significant effect on the environment, the activity is not subject to CEQA.

Culver Drive and University Drive Intersection Improvements Project:

This project is subject to the California Environmental Quality Act (CEQA). In compliance with CEQA, the California Public Resources Code Section 21000 et. seq., and per the California CEQA Guidelines in the Code of Regulations, Title 14, Division 6, Chapter 3, the City of Irvine, as lead agency, is responsible for the required environmental compliance.

RECOMMENDATION:

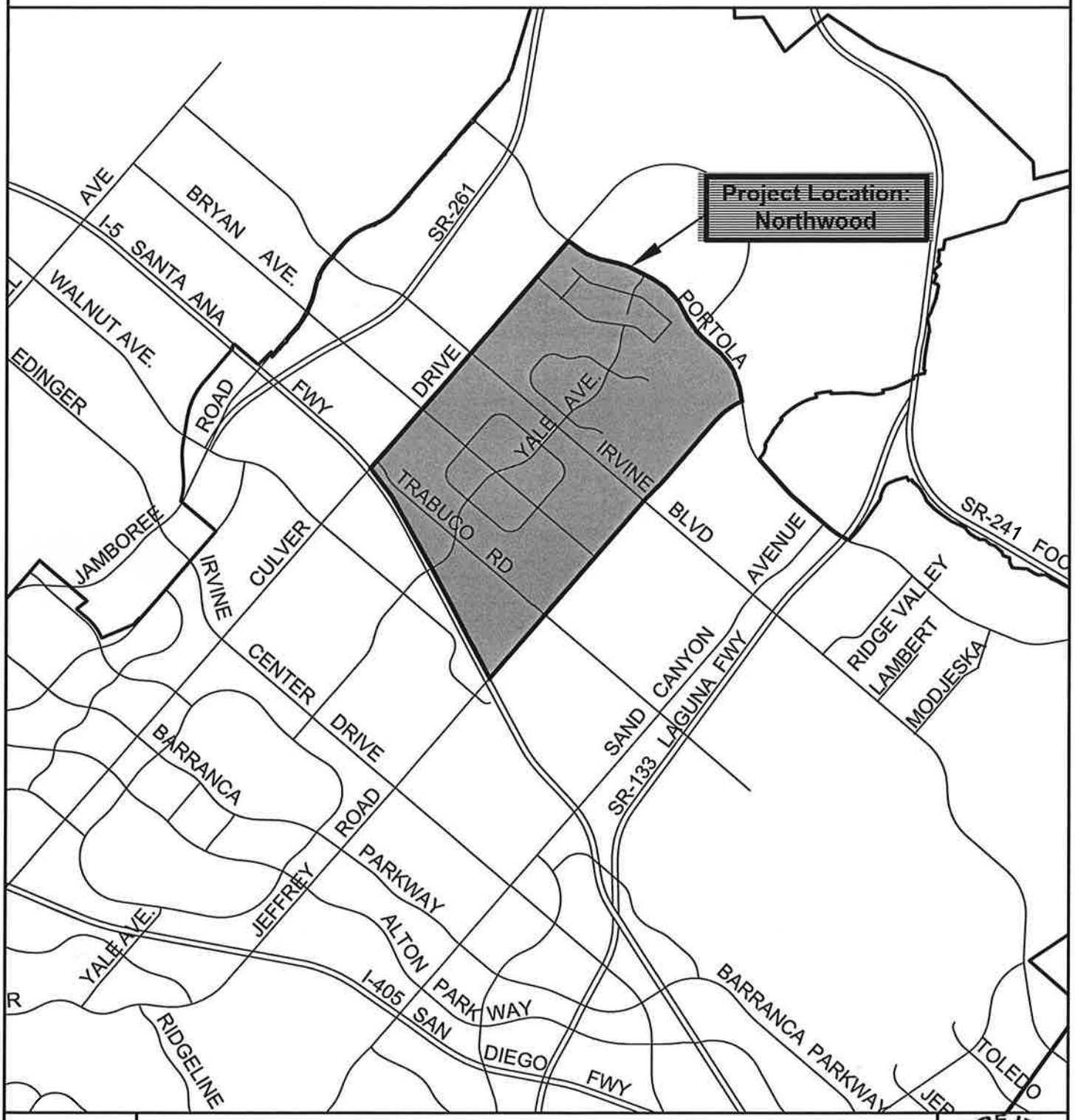
That the Board authorize the General Manager to execute Reimbursement Agreements with the City of Irvine for the Annual Slurry Seal and Pavement Rehabilitation project and the Culver Drive and University Drive Intersection Improvements project.

LIST OF EXHIBITS:

Exhibit "A" – Annual Slurry Seal and Pavement Rehabilitation Vicinity Map
Exhibit "B" – Annual Slurry Seal and Pavement Rehabilitation Engineer's Estimate
Exhibit "C" – Annual Slurry Seal and Pavement Rehabilitation Reimbursement Agreement
Exhibit "D" – Culver Drive and University Drive Intersection Vicinity Map
Exhibit "E" – Culver Drive and University Drive Intersection Engineer's Estimate
Exhibit "F" – Culver Drive and University Drive Intersection Reimbursement Agreement

EXHIBIT "A"

ANNUAL STREET REHABILITATION AND SLURRY SEAL PROJECT
FY 2018-19



VICINITY MAP

EXHIBIT "B"

**REIMBURSEMENT AGREEMENT BETWEEN IRVINE RANCH WATER DISTRICT (IRWD)
AND THE CITY OF IRVINE
FOR
ANNUAL STREET REHABILITATION AND SLURRY SEAL PROJECT, BID NO. 19-XXXX**

ENGINEER'S ESTIMATE

ITEM NO.	DESCRIPTION	QUANTITY	UNITS	UNIT COST	EXTENDED AMOUNT
A-1	INSTALL NEW IRWD WATER VALVE FRAME AND COVER TO GRADE	673	EA	$ 850.00	$ 572,050.00
A-2	INSTALL NEW IRWD RECLAIM WATER VALVE FRAME AND COVER TO GRADE	43	EA	$ 850.00	$ 36,550.00
A-3	INSTALL NEW IRWD SEWER CLEANOUT FRAME AND COVER TO GRADE	121	EA	$ 850.00	$ 102,850.00
A-4	ADJUST EXISTING IRWD SEWER MANHOLE FRAME AND COVER TO GRADE	295	EA	$ 850.00	$ 250,750.00
				TOTAL CONSTRUCTION ESTIMATE	**$ 962,200.00**
				4% ADMINSTRATION FEE PER SECTION 5 OF AGREEMENT	**$ 38,488.00**
				TOTAL COSTS	**$ 1,000,688.00**

EXHIBIT "C"

File No.

REIMBURSEMENT AGREEMENT BETWEEN
IRVINE RANCH WATER DISTRICT
AND THE CITY OF IRVINE
FOR
INSTALLATION AND ADJUSTMENT OF STREET UTILITIES TO GRADE FOR
ANNUAL STREET REHABILITATION AND SLURRY SEAL
BID NO. 19-XXXX

This Agreement is made and entered into as of this ____ day of _____, 2018, by and between IRVINE RANCH WATER DISTRICT, a California water district formed and existing pursuant to the California Water District Law, hereinafter referred to as "DISTRICT," and the CITY OF IRVINE, a municipal corporation, hereinafter referred to as "CITY."

W I T N E S S E T H:

WHEREAS, CITY proposes to construct street and utility improvements within the Northwood communities for the ANNUAL STREET REHABILITATION AND SLURRY SEAL, Bid No. 19-XXXX (the "Project"), within the jurisdictional boundaries of DISTRICT and the City of Irvine; and

WHEREAS, such construction will necessitate the installation or adjustment to grade of approximately 673 Water Valves, approximately 43 Recycled Water Valves, approximately 121 Sewer Cleanouts and approximately 295 Sewer Manholes, as depicted on Exhibit "A" attached hereto incorporated by reference herein (hereinafter referred to as the "IRWD FACILITIES"); and

WHEREAS, the parties have determined that it would be more expedient for CITY to construct the IRWD FACILITIES rather than for DISTRICT to do so; and

WHEREAS, DISTRICT is amenable to the CITY constructing the IRWD FACILITIES with the CITY agreeing to advance the costs; and

WHEREAS, DISTRICT agrees to fully reimburse the CITY through payments billed by the CITY and approved by DISTRICT for the entire cost of the IRWD FACILITIES; and

WHEREAS, except as otherwise provided herein, upon the completion of the IRWD FACILITIES, the IRWD FACILITIES shall become the property of DISTRICT in accordance with the terms and conditions hereinafter set forth.

NOW, THEREFORE, in consideration of the mutual promises and covenants hereinafter set forth, the parties hereto agree as follows:

SECTION 1. IRWD FACILITIES. In conjunction with the Project, CITY agrees to initiate and pursue to completion the design and construction of the IRWD FACILITIES.

SECTION 2. PLANS. CITY agrees that the IRWD FACILITIES shall be completed pursuant to approved project plans and specifications (the "Plans and Specifications") which shall be approved by DISTRICT and used in awarding the construction contract. Prior to commencement of preparation of the Plans and Specifications, CITY shall submit its design engineer's proposal for the design of the IRWD FACILITIES to DISTRICT. DISTRICT will have a period of five (5) calendar days from its receipt of such design proposal to review and either indicate its approval or request changes. CITY shall cause its design engineer to review and respond to any requested changes. The Plans and Specifications shall be deemed to incorporate the applicable portions of DISTRICT's latest edition of "Construction Manual for the Construction of Water, Sewer, and Reclaimed Water Facilities" (the "Construction Manual"). The IRWD FACILITIES shall be contracted by CITY together with non-reimbursable work to be completed by CITY within the Project pursuant to plans prepared by CITY's design engineer.

SECTION 3. BIDDING AND AWARD. The parties agree that the construction of the IRWD FACILITIES shall be included in CITY's contract(s) awarded for the Project and that the IRWD FACILITIES shall be bid as a separate item or items that can be deleted. During the bidding process, CITY shall deliver to IRWD one (1) complete set of the bid documents that include the IRWD FACILITIES, including all related addenda concurrently with the distribution thereof to prospective bidders. Upon opening of bids by CITY, CITY will submit the bids or a spread sheet summary of the bids to DISTRICT. DISTRICT will have a period of ten (10) calendar days from its receipt of the bid results for review and approval of the IRWD FACILITIES bid item(s) submitted by the bidder identified to DISTRICT by CITY as CITY's proposed successful bidder. CITY agrees that bids received for the construction of the IRWD

FACILITIES bid item(s) shall be subject to the approval of DISTRICT prior to award of the Project construction contract(s) that include the IRWD FACILITIES; and further agrees that in the event DISTRICT does not approve such bids, either party may terminate this Agreement upon twenty-four (24) hours' prior written notice, in which event CITY shall have no further obligation to construct the IRWD FACILITIES, and DISTRICT may elect to install the IRWD FACILITIES with its own contractor. If DISTRICT approves of the IRWD FACILITIES bid item(s) of CITY's successful bidder, CITY agrees to cause the IRWD FACILITIES to be constructed as part of the contract awarded to such bidder. The total estimated construction cost for the IRWD FACILITIES is $962,200 provided, however, the amount to be reimbursed by DISTRICT shall be based on the actual costs of construction. Upon award of the construction contract, CITY shall provide DISTRICT with one (1) original copy of the fully executed contract documents and one (1) copy of the bid package relating to the IRWD FACILITIES received from the successful bidder.

SECTION 4. DESIGN REVISIONS AND CHANGE ORDERS. DISTRICT agrees to reimburse CITY for any change order(s) for revision(s) requested by DISTRICT or otherwise required to construct the IRWD FACILITIES. CITY shall promptly furnish DISTRICT with copies of any proposed change order(s) to such contract within five (5) working days of the initiation of the changed conditions to such contract, which shall be subject to DISTRICT approval if and to the extent the IRWD FACILITIES are affected therefrom.

DISTRICT shall promptly review proposed change order(s) and provide CITY with a response within five (5) working days or sooner of receiving proposed change order(s) information from CITY. DISTRICT agrees not to unreasonably cause delay(s) to the construction schedule of the Project in reviewing proposed change order(s) for the IRWD FACILITIES. Notwithstanding any other provision herein, any approval required to be given by the DISTRICT under this Section shall be deemed given if no response to the CITY's request for such approval is received by the CITY within eight (8) working days following the written request for such approval unless the parties agree otherwise in a writing executed by both parties.

SECTION 5. REIMBURSEMENT. DISTRICT agrees to reimburse CITY for the following costs (collectively, the "Costs"): (1) the actual costs of design, construction, permits, bonds, and legal fees (excluding the costs of preparation of this Agreement) incurred by CITY in connection with the design and construction of the IRWD FACILITIES, plus (2) an administration fee which shall be equal to four percent (4%) of the actual cost of construction (costs paid directly to CITY's contractor for construction, only, excluding any cost for design,

surveying, geotechnical or other work) of the IRWD FACILITIES and which shall be deemed to cover all costs of project administration, including, but not limited to, accounting, inspection, surveying, compaction testing, geotechnical services and engineering. CITY shall keep a separate accounting of all Costs incurred by CITY in relation to the IRWD FACILITIES.

Within sixty (60) days of DISTRICT's acceptance of the IRWD FACILITIES as provided in Section 8, a final accounting of the Costs shall be made by CITY and submitted to DISTRICT along with an invoice for the Costs and any supporting documentation necessary to show the amounts which represent Costs of IRWD FACILITIES. Amounts paid pursuant to progress payment invoices shall be subject to adjustment in the final accounting. Within thirty (30) days of said final accounting, DISTRICT agrees to pay to CITY the total amount of the Costs.

SECTION 6. LAWS, ORDINANCES, RULES AND REGULATIONS. CITY shall require in its contract for the construction of the IRWD FACILITIES that its contractor be fully informed of and comply with all laws, ordinances, rules and regulations, including, but not limited to, all applicable requirements of the California Labor Code, prevailing wage laws, the Construction Manual, and the Rules and Regulations of DISTRICT, in connection with the construction of the IRWD FACILITIES.

SECTION 7. INSPECTION. DISTRICT shall have sole and absolute discretion as to all aspects of design and construction of the IRWD FACILITIES, and DISTRICT shall be entitled to inspect the construction of IRWD FACILITIES as it deems necessary to assure compliance with the Plans and Specifications, including shop drawing review and material inspection thereof. DISTRICT shall have access to all phases of the Project work to be performed by CITY for the purpose of such inspection; provided, however, all questions regarding the work being performed will be directed to CITY's resident engineer. DISTRICT will promptly notify CITY of any portion of the work on the IRWD FACILITIES which appears not to conform to the Plans and Specifications. The determination of DISTRICT as to conformity of the IRWD FACILITIES with the Plans and Specifications shall be made in DISTRICT's sole and absolute discretion. DISTRICT agrees not to unreasonably withhold its approval as to such conformity of the IRWD FACILITIES with the Plans and Specifications. CITY shall require its contractor to construct the IRWD FACILITIES so that the IRWD FACILITIES conform to the Plans and Specifications. CITY agrees to assume full responsibility for certifying or obtaining certification of the compaction of backfill material over the IRWD FACILITIES.

SECTION 8. ACCEPTANCE. DISTRICT agrees to accept the IRWD FACILITIES when the IRWD FACILITIES have been completed by CITY in accordance with all requirements of the Plans and Specifications, including any change orders approved by DISTRICT as provided in Section 3 hereof. At the time of completion and acceptance of the IRWD FACILITIES, CITY agrees to furnish DISTRICT with one (1) copy of the contractor's redlined set of blueline "record" drawings (showing all revisions, manufacturer and type of valves, pipe and fittings as required by DISTRICT) and one (1) copy of the compaction reports and certificate, survey notes and cut sheets.

SECTION 9. OWNERSHIP. It is mutually agreed between the parties hereto that notwithstanding the fact that CITY shall accomplish the construction of the IRWD FACILITIES subject to reimbursement, the IRWD FACILITIES to be completed hereunder, together with the necessary franchises, licenses, easements, rights-of-way, and other privileges, shall at all times be subject to the applicable rates, rules and regulations of DISTRICT, as modified or amended from time to time. CITY hereby disclaims any interest in the IRWD FACILITIES and does hereby transfer and assign to DISTRICT any and all right, title, and interest it may have in the IRWD FACILITIES. DISTRICT shall own, operate and maintain the IRWD FACILITIES following acceptance thereof.

SECTION 10. GUARANTEES. CITY will, pursuant to the requirement(s) of the Plans and Specifications, cause its contractor(s) for the IRWD FACILITIES to guarantee the IRWD FACILITIES against defects in workmanship and materials for a period of one (1) year from the date of acceptance by CITY, which acceptance shall be given only after acceptance by DISTRICT as provided in Section 8. It is further agreed that CITY shall cause the IRWD FACILITIES to be brought or restored to full compliance with the requirements of the Plans and Specifications, including any test requirements, for any portions of the IRWD FACILITIES which during said one (1) year period are found not to be in conformance with the provisions of the Plans and Specifications. This guarantee is in addition to any and all other warranties, express or implied, from CITY's contractors or material manufacturers, with respect to the IRWD FACILITIES. The guarantee and obligations under this section shall in no way be relieved by DISTRICT's inspection and/or acceptance of the IRWD FACILITIES. This section sets forth the entire guarantee and warranty of CITY with respect to the IRWD FACILITIES. The express or implied warranties of other persons with respect to IRWD FACILITIES shall in no way be limited by the guarantee and warranty of CITY contained in this section. If requested by DISTRICT, CITY agrees to assign to DISTRICT the contractor's guarantee and/or any other guarantees or warranties relating to the IRWD FACILITIES.

SECTION 11. INDEMNIFICATION. CITY shall indemnify, defend and hold DISTRICT, its officers, agents, employees, and engineers harmless from any expense, liability or claim for death, injury, loss, damage or expense to persons or property which may arise or is claimed to have arisen during construction of the IRWD FACILITIES as a result of any work or action performed by CITY or on behalf of CITY, save and except to the extent such expense, liability or claim is proximately caused in whole or in part by any act, omission, or negligence of DISTRICT, its officers, agents, employees or engineers or by any act or omission for which DISTRICT, its officers, agents, employees or engineers are liable without fault.

DISTRICT shall indemnify, defend and hold CITY, its officers, agents, and employees, harmless from any expense, liability or claim for death, injury, loss, damage or expense to persons or property which may arise or is claimed to have arisen either (i) as a result of any acts performed by DISTRICT, its officers, agents, or employees, with respect to the IRWD FACILITIES construction; or (ii) following DISTRICT acceptance of the IRWD FACILITIES, with respect to maintenance and operation of the IRWD FACILITIES, save and except to the extent such expense, liability or claim is proximately caused in whole or in part by any negligence of CITY, its officers, agents, employees or engineers, or by any act or omission for which CITY, its officers, agents, employees or engineers are liable without fault.

SECTION 12. INSURANCE AND BONDING. CITY shall cause its contractor(s) to provide performance and payment bonds for the construction of the Project including the IRWD FACILITIES and to obtain insurance coverage sufficiently broad to insure the matters set forth in this Agreement and to include DISTRICT, its officers, agents, employees and engineers, as additional insureds on all insurance policies that CITY requires its contractor(s) to provide. As evidence of such insurance coverage, CITY shall, prior to commencement of construction of the IRWD FACILITIES, provide DISTRICT with certificates of insurance and insurance endorsements from CITY's contractor(s) in a form acceptable to DISTRICT.

SECTION 13. TERMINATION. DISTRICT shall have the right to terminate this Agreement at any time, subject to the provisions of this section, by providing five (5) business days' prior written notice to CITY, except as noted in Section 3. If at the request or direction of a party other than CITY, the construction of the IRWD FACILITIES is not accomplished or completed, DISTRICT shall remain obligated for the actual amount of the Costs incurred by CITY to the date of termination.

If CITY's Project is canceled or modified so as to eliminate the necessity of the construction of the IRWD FACILITIES, CITY shall have the right to terminate this Agreement and thereby terminate its obligation to construct the IRWD FACILITIES, by providing five (5) business days' prior written notice to DISTRICT. In such case, DISTRICT will not be obligated for any design or any other Costs incurred by CITY. If IRWD elects to construct the IRWD FACILITIES, DISTRICT may, but shall not be obligated to, acquire the design or other work from CITY by separate agreement.

SECTION 14. NOTICE. Any notice or other written instrument required or permitted by this Agreement to be given to either party shall be deemed received when personally served or twenty-four (24) hours after being deposited in the U.S. Mail, postage prepaid, registered or certified and addressed as follows:

DISTRICT: Irvine Ranch Water District
15600 Sand Canyon Avenue
P.O. Box 57000
Irvine, CA 92619-7000
Attn: General Manager

CITY: City of Irvine
6427 Oak Canyon, Bldg. 1
Irvine, CA 92618
Attn: Allison Tran, Associate Engineer

SECTION 15. SUCCESSORS AND ASSIGNS; INTEGRATION; AMENDMENT. This Agreement shall be binding upon and inure to the benefit of the successor and assigns of CITY and DISTRICT. This Agreement constitutes the entire Agreement between CITY and DISTRICT and supersedes all prior understandings and agreements between the parties with respect to the subjects hereof. This Agreement may be modified only in writing signed by both parties hereto.

SECTION 16. LEGAL FEES. In the event of any declaratory or other legal or equitable action instituted between CITY and DISTRICT in connection with this Agreement, the prevailing party shall be entitled to recover from the losing party all of its costs and expenses, including court costs and reasonable attorneys' fees.

SECTION 17. DEEMED APPROVAL. Any approval required to be given by either party pursuant to this Agreement shall be deemed given if no response to the party's request for

such approval is received by the requesting party within fifteen (15) days following the written request for such approval.

SECTION 18. SEVERABILITY. If any term, provision, covenant or condition of this Agreement is held to be invalid, void or other unenforceable, to any extent, by any court of competent jurisdiction, the remainder of this Agreement shall not be affected thereby, and each term provision, covenant or condition of this Agreement shall be valid and enforceable to the fullest extent permitted by law.

SECTION 19. APPLICABLE LAW. This Agreement shall be construed and enforced in accordance with the laws of the State of California.

SECTION 20. WAIVER. The waiver of any provision of this Agreement by either party shall not be deemed to be a waiver of any other provision or of any preceding or subsequent breach hereunder.

IN WITNESS WHEREOF, the parties to the Agreement have executed this Agreement on the date herein above written.

IRVINE RANCH WATER DISTRICT

By_____ Dated _____
Paul Cook, General Manager

ATTEST:

By_____ Dated _____
Secretary/Assistant Secretary

APPROVED AS TO FORM:

By_____ Dated _____
Legal Counsel, IRWD

CITY OF IRVINE
A Municipal Corporation

By_____ Dated _____
Grace Leung
Acting City Manager of the City of Irvine

By_____ Dated _____
Manuel Gomez
Director of Public Works

ATTEST:

By_____ Dated _____
Molly McLaughlin
City Clerk of the City of Irvine

APPROVED AS TO FORM:

By_____ Dated _____
Jeffrey Melching, RUTAN & TUCKER, LLP
City Attorney of the City of Irvine

EXHIBIT "A"

REIMBURSEMENT AGREEMENT BETWEEN IRVINE RANCH WATER DISTRICT (IRWD)
AND THE CITY OF IRVINE
FOR
ANNUAL STREET REHABILITATION AND SLURRY SEAL PROJECT, BID NO. 19-XXXX

ENGINEER'S ESTIMATE

ITEM NO.	DESCRIPTION	QUANTITY	UNITS	UNIT COST	EXTENDED AMOUNT
A-1	INSTALL NEW IRWD WATER VALVE FRAME AND COVER TO GRADE	673	EA	$ 850.00	$ 572,050.00
A-2	INSTALL NEW IRWD RECLAIM WATER VALVE FRAME AND COVER TO GRADE	43	EA	$ 850.00	$ 36,550.00
A-3	INSTALL NEW IRWD SEWER CLEANOUT FRAME AND COVER TO GRADE	121	EA	$ 850.00	$ 102,850.00
A-4	ADJUST EXISTING IRWD SEWER MANHOLE FRAME AND COVER TO GRADE	295	EA	$ 850.00	$ 250,750.00
				TOTAL CONSTRUCTION ESTIMATE	**$ 962,200.00**
				4% ADMINSTRATION FEE PER SECTION 5 OF AGREEMENT	**$ 38,488.00**
				TOTAL COSTS	**$ 1,000,688.00**

EXHIBIT "D"

Aerial Photograph — Exhibit 3

Culver Dr. at University Dr. Intersection Improvement Project

N W E S

200 100 0 200 Feet

Bonterra CONSULTING

(Rev. 4-15-2014 JAZ) R:\Projects\Kimley-Horn\2012\Graphics\MND\ex3_Aerial.cdr

EXHIBIT "E"

BID SUMMARY
Culver/University Intersection Improvements, CIP 318030, Bid No. 18-1336
Bid Opening: Tuesday, May 1, 2018 10:00 AM (Pacific)

WITHDREW BID ON 5/2/18

				#1		#2		#3		#4		#5		#6	
				Klassic Engineering		Beador Construction Company, Inc.		Los Angeles Engineering		PUB Construction Inc.		Excel Paving Co.		All American Asphalt	
ITEM	WORK DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL	UNIT PRICE	TOTAL	UNIT PRICE	TOTAL	UNIT PRICE	TOTAL	UNIT PRICE	TOTAL	UNIT PRICE	TOTAL
1	MOBILIZATION	LS	1	$210,000.00	$210,000.00	$203,468.00	$203,468.00	$453,500.50	$453,500.50	$45,000.00	$45,000.00	$190,000.00	$190,000.00	$64,810.71	$64,810.71
2	PREPARE AND IMPLEMENT STORM WATER POLLUTION AND CONTROL PLANS (SWPPP) AND EROSION CONTROL PLAN	LS	1	$44,000.00	$44,000.00	$50,000.00	$50,000.00	$27,000.00	$27,000.00	$30,000.00	$30,000.00	$24,000.00	$24,000.00	$25,000.00	$25,000.00
3	CONSTRUCTION SCHEDULE (CRITICAL PATH METHOD)	LS	1	$14,000.00	$14,000.00	$5,500.00	$5,500.00	$9,000.00	$9,000.00	$10,000.00	$10,000.00	$17,999.25	$17,999.25	$5,000.00	$5,000.00
4	Specialty Item - TRAFFIC CONTROL	LS	1	$62,000.00	$62,000.00	$115,000.00	$115,000.00	$130,000.00	$130,000.00	$90,000.00	$90,000.00	$269,269.00	$269,269.00	$387,000.00	$387,000.00
5	CLEARING AND GRUBBING (INCLUDING FOR LANDSCAPING)	LS	1	$43,000.00	$43,000.00	$125,000.00	$125,000.00	$123,000.00	$123,000.00	$75,000.00	$75,000.00	$230,000.00	$230,000.00	$125,000.00	$125,000.00
6	REMOVE CURB AND GUTTER	LF	2,420	$8.14	$19,698.80	$12.00	$29,040.00	$6.00	$14,520.00	$6.50	$15,730.00	$19.00	$45,980.00	$25.00	$60,500.00
7	REMOVE AND DISPOSE CONCRETE PATHWAY	CY	60	$250.00	$15,000.00	$120.00	$7,200.00	$100.00	$6,000.00	$370.00	$22,200.00	$114.00	$6,840.00	$265.00	$15,900.00
8	REMOVE AC/AB	CY	1,300	$71.23	$92,599.00	$72.00	$93,600.00	$66.00	$85,800.00	$70.00	$91,000.00	$115.00	$149,500.00	$170.00	$221,000.00
9	REMOVE AND DISPOSE MEDIAN CURB AND GUTTER	LF	2,500	$5.00	$12,500.00	$7.30	$18,250.00	$3.00	$7,500.00	$6.80	$17,000.00	$15.00	$37,500.00	$23.00	$57,500.00
10	REMOVE AND DISPOSE OF SIGN	EA	2	$100.00	$200.00	$270.00	$540.00	$100.00	$200.00	$4,000.00	$8,000.00	$277.00	$554.00	$150.00	$300.00
11	REMOVE AND DISPOSE 18" RCP	LF	13	$330.77	$4,300.01	$205.00	$2,665.00	$300.00	$3,900.00	$785.00	$9,555.00	$96.00	$1,248.00	$478.00	$6,214.00
12	REMOVE AND DISPOSE CATCH BASIN	LS	1	$1,500.00	$1,500.00	$2,750.00	$2,750.00	$1,000.00	$1,000.00	$8,500.00	$8,500.00	$2,500.00	$2,500.00	$3,721.00	$3,721.00
13	REMOVE AND DISPOSE PARKWAY DRAIN	EA	1	$1,500.00	$1,500.00	$550.00	$550.00	$500.00	$500.00	$10,000.00	$10,000.00	$1,300.00	$1,300.00	$1,595.00	$1,595.00
14	REMOVE AND DISPOSE DOUBLE PARAPET	LS	1	$4,500.00	$4,500.00	$18,750.00	$18,750.00	$3,500.00	$3,500.00	$18,000.00	$18,000.00	$1,700.00	$1,700.00	$5,300.00	$5,300.00
15	REMOVE AND DISPOSE DOUBLE RCB WINGWALL	LS	1	$10,000.00	$10,000.00	$20,750.00	$20,750.00	$10,000.00	$10,000.00	$18,000.00	$18,000.00	$7,600.00	$7,600.00	$31,000.00	$31,000.00
16	REMOVE AND DISPOSE RIPRAP SLOPE PROTECTION	CY	41	$107.31	$4,399.71	$145.00	$5,945.00	$100.00	$4,100.00	$450.00	$18,450.00	$115.00	$4,715.00	$450.00	$18,450.00
17	REMOVE AND DISPOSE GROUTED RIPRAP SLOPE PROTECTION	CY	33	$398.71	$13,157.43	$145.00	$4,785.00	$100.00	$3,300.00	$600.00	$19,800.00	$155.00	$5,115.00	$530.00	$17,490.00
18	REMOVE AND DISPOSE ABANDONED STREAM GAUGING STATION ENCLOSURE & FOUNDATION, AND ANTENNA POLE AND FOUNDATION	LS	1	$12,500.00	$12,500.00	$2,700.00	$2,700.00	$5,000.00	$5,000.00	$26,000.00	$26,000.00	$2,300.00	$2,300.00	$2,700.00	$2,700.00
19	REMOVE AND DISPOSE CHAIN-LINK FENCE AND GATE	LF	185	$11.92	$1,500.20	$30.00	$5,550.00	$12.00	$2,220.00	$58.00	$10,730.00	$12.00	$2,220.00	$20.00	$3,700.00
20	REMOVE AND DISPOSE SIDEWALK	SF	13,015	$3.00	$39,045.00	$2.20	$28,633.00	$1.00	$13,015.00	$4.50	$58,567.50	$1.15	$14,967.25	$3.30	$42,949.50
21	REMOVE AND DISPOSE CONCRETE RAMP	EA	1	$2,000.00	$2,000.00	$1,625.00	$1,625.00	$300.00	$300.00	$8,500.00	$8,500.00	$1,100.00	$1,100.00	$2,500.00	$2,500.00
22	REMOVE AND DISPOSE OF 4" THICK STAMPED CONCRETE	SF	1,515	$2.98	$4,514.70	$3.50	$5,302.50	$1.00	$1,515.00	$8.50	$12,877.50	$9.00	$13,635.00	$3.30	$4,999.50
23	REMOVE, SALVAGE AND INSTALL BUS SHELTER	LS	1	$5,500.01	$5,500.00	$2,700.00	$2,700.00	$7,000.00	$7,000.00	$20,000.00	$20,000.00	$4,300.00	$4,300.00	$4,700.00	$4,700.00
24	REMOVE AND RELOCATE SIGN	EA	7	$100.00	$700.00	$270.00	$1,890.00	$200.00	$1,400.00	$1,500.00	$10,500.00	$386.00	$2,660.00	$300.00	$2,100.00
25	CONSTRUCT ASPHALT CONRETE (8" THICK)	TON	1,950	$107.15	$209,001.00	$94.00	$183,300.00	$114.00	$222,300.00	$82.50	$160,875.00	$93.00	$181,350.00	$75.00	$146,250.00
26	CONSTRUCT CLASS 2 AGGREGATE BASE (12" THICK)	TON	2,800	$22.85	$63,980.00	$46.00	$128,800.00	$36.00	$100,800.00	$30.00	$84,000.00	$43.00	$120,400.00	$38.00	$106,400.00
27	CONSTRUCT TYPE A-2 CURB AND GUTTER PER COI STD PLAN 200	LF	2,430	$45.00	$109,350.00	$30.00	$72,900.00	$30.00	$72,900.00	$30.00	$72,900.00	$53.00	$128,790.00	$42.50	$103,275.00
28	CONSTRUCT TYPE B-8 MEDIAN CURB PER COI STD. PLAN 209	LF	2,470	$45.00	$111,150.00	$27.50	$67,925.00	$22.00	$54,340.00	$22.00	$54,340.00	$29.00	$71,630.00	$30.00	$74,100.00
29	CONSTRUCT CURB TRANSITION FROM 6" CURB to 8" CURB	LF	20	$40.00	$800.00	$65.00	$1,300.00	$50.00	$1,000.00	$410.00	$8,200.00	$43.00	$860.00	$180.00	$3,600.00
30	FURNISH AND INSTALL 6' CHAIN LINK FENCE WITH BLACK VINYL COATING PER SPPWC STD PLAN 600-3	LF	200	$65.00	$13,000.00	$80.00	$16,000.00	$50.00	$10,000.00	$87.00	$17,400.00	$130.00	$26,000.00	$75.00	$15,000.00
31	CONSTRUCT 4" THICK PCC SIDEWALK PER COI STD PLAN 201	SF	12,100	$8.43	$102,003.00	$5.00	$60,500.00	$7.00	$84,700.00	$10.25	$124,025.00	$9.00	$108,900.00	$7.00	$84,700.00
32	CONSTRUCT CURB ACCESS RAMP (ECR TO BCR) PER COI STD PLAN 202	EA	4	$4,000.00	$16,000.00	$6,000.00	$24,000.00	$5,400.00	$21,600.00	$12,000.00	$48,000.00	$4,500.00	$18,000.00	$10,000.00	$40,000.00
33	CONSTRUCT DRIVEWAY APPROACH TYPE I PER COI STD PLAN 204	SF	260	$10.00	$2,600.00	$32.00	$8,320.00	$15.00	$3,900.00	$68.00	$17,680.00	$23.00	$5,980.00	$18.00	$4,680.00
34	CONSTRUCT BUS PAD PER OCTA FIGURES 22A & 23 AND COI STD PLAN 209	SF	1,010	$12.00	$12,120.00	$19.00	$19,190.00	$11.00	$11,110.00	$19.00	$19,190.00	$23.00	$23,230.00	$21.00	$21,210.00
35	CONSTRUCT 6" THICK PCC PATHWAY	SF	2,510	$8.00	$20,080.00	$8.00	$20,080.00	$7.00	$17,570.00	$16.50	$41,415.00	$13.50	$33,885.00	$11.00	$27,610.00
36	CONSTRUCT FULL DEPTH AC PAVEMENT SECTION (17" THICK)	TON	136	$242.94	$32,999.04	$100.00	$13,600.00	$240.00	$32,640.00	$213.00	$28,968.00	$170.00	$23,120.00	$215.00	$29,240.00
37	COLD PLANE EXISTING PAVEMENT (VARYING DEPTH, 0.12" MIN)	SF	106,600	$0.26	$27,716.00	$0.30	$31,980.00	$0.25	$26,650.00	$0.45	$47,970.00	$0.35	$37,310.00	$0.42	$44,772.00
38	CONSTRUCT 0.12" MIN ARHM SURFACE COURSE	TON	1,000	$100.00	$100,000.00	$94.00	$94,000.00	$103.98	$103,980.00	$145.00	$145,000.00	$97.00	$97,000.00	$87.45	$87,450.00
39	UNCLASSIFIED EXCAVATION	CY	5,730	$7.00	$40,840.00	$43.00	$246,390.00	$40.00	$229,200.00	$30.00	$171,900.00	$71.00	$406,830.00	$50.50	$286,500.00
40	UNCLASSIFIED FILL	CY	730	$13.33	$9,730.90	$34.00	$24,820.00	$29.00	$21,170.00	$55.00	$40,150.00	$51.00	$37,230.00	$40.00	$29,200.00
41	CONSTRUCT RETAINING WALL TYPE 6 PER SPPWC STD PLAN 615-4	LF	195	$349.00	$68,055.00	$985.00	$192,075.00	$800.00	$156,000.00	$858.00	$167,310.00	$960.00	$187,200.00	$1,150.00	$224,250.00
42	CONSTRUCT 6" RETAINING CURB TYPE "B-6" PER COI STD PLAN NO 200	LF	66	$45.00	$2,970.00	$45.00	$2,970.00	$50.00	$3,300.00	$135.00	$8,910.00	$54.00	$3,564.00	$26.00	$1,716.00
43	CONSTRUCT 18" RCP PER COI STD PLAN NO. 318	LF	25	$48.00	$1,250.00	$540.00	$13,500.00	$350.00	$8,750.00	$420.00	$10,500.00	$218.00	$5,450.00	$908.00	$22,701.00
44	CONSTRUCT CATCH BASIN TYPE I (W=3.5') WITH LOCAL DEPRESSION, PER COI STD PLAN 300	EA	1	$12,000.00	$12,000.00	$7,000.00	$7,000.00	$4,500.00	$4,500.00	$14,570.00	$14,570.00	$7,000.00	$7,000.00	$9,800.00	$9,800.00
45	CONSTRUCT CATCH BASIN TYPE B (W=14.0') WITH LOCAL DEPRESSION, PER COI STD PLAN 301 (W=14.0')	EA	1	$12,800.00	$12,800.00	$11,825.00	$11,825.00	$13,500.00	$13,500.00	$18,420.00	$18,420.00	$9,700.00	$9,700.00	$13,300.00	$13,300.00
46	Specialty Item - INSTALL FILTERRA BIOFILTRATION SYSTEM (MODEL: FT1606)	EA	2	$10,000.00	$20,000.00	$62,000.00	$124,000.00	$55,000.00	$110,000.00	$30,000.00	$60,000.00	$54,000.00	$108,000.00	$66,666.00	$133,332.00
47	CONSTRUCT CONCRETE COLLAR PER IRVINE STD PLAN NO. 310	EA	1	$120.00	$120.00	$1,075.00	$1,075.00	$900.00	$900.00	$9,000.00	$9,000.00	$1,100.00	$1,100.00	$1,065.00	$1,065.00
48	Final Pay Item - CONSTRUCT DOUBLE 15'x8' RCB EXTENSION	CY	180	$100.00	$18,000.00	$1,215.00	$218,700.00	$1,000.00	$180,000.00	$1,580.00	$284,400.00	$970.00	$174,600.00	$1,635.00	$294,300.00
49	Final Pay Item - CONSTRUCT WARPED WINGWALL TYPE B , PER SSPWC STD PLAN 611-3	CY	75	$120.00	$9,000.00	$2,500.00	$187,500.00	$1,000.00	$75,000.00	$1,975.00	$148,125.00	$1,400.00	$105,000.00	$2,015.00	$151,125.00
50	Final Pay Item - PLACE 1/4 TON ROCK SLOPE PROTECTION	CY	50	$300.00	$15,000.00	$205.00	$10,250.00	$145.00	$7,250.00	$660.00	$32,500.00	$206.00	$10,300.00	$320.00	$16,000.00
51	CONTRUCT CHAIN LINK GATE PER OCPW STD PLAN 600-3	EA	1	$2,500.00	$2,500.00	$4,000.00	$4,000.00	$2,200.00	$2,200.00	$8,800.00	$8,800.00	$2,700.00	$2,700.00	$600.00	$600.00
52	CONSTRUCT JUNCTION STRUCTURE TYPE V PER OCPW STD PLAN 333-2-OC	EA	1	$3,500.00	$3,500.00	$2,150.00	$2,150.00	$5,100.00	$5,100.00	$6,900.00	$6,900.00	$4,100.00	$4,100.00	$5,400.00	$5,400.00
53	Specialty Item - MODIFY EXISTING & INSTALL NEW IRRIGATION SYSTEM	SF	21,600	$4.40	$95,040.00	$4.40	$95,040.00	$3.50	$75,600.00	$5.50	$118,800.00	$4.15	$89,640.00	$3.77	$81,432.00
54	Specialty Item - REMOVE AND DISPOSE OF IRRIGATION CONTROL VALVE	EA	3	$100.00	$300.00	$107.00	$321.00	$800.00	$2,400.00	$4,000.00	$12,000.00	$164.00	$492.00	$160.00	$480.00
55	Specialty Item - 24" BOX TREES	EA	33	$364.00	$12,012.00	$325.00	$10,725.00	$320.00	$10,560.00	$930.00	$30,690.00	$388.00	$12,804.00	$375.00	$12,375.00
56	Specialty Item - 36" BOX TREES	EA	12	$1,000.00	$12,000.00	$900.00	$10,800.00	$820.00	$9,840.00	$3,200.00	$38,400.00	$833.00	$9,996.00	$797.50	$9,564.00

BID SUMMARY
Culver/University Intersection Improvements, CIP 318030, Bid No. 18-1336
Bid Opening: Tuesday, May 1, 2018 10:00 AM (Pacific)

WITHDREW BID ON 5/2/18

				#1		#2		#3		#4		#5		#6	
				Klassic Engineering		Beador Construction Company, Inc.		Los Angeles Engineering		PUB Construction Inc.		Excel Paving Co.		All American Asphalt	
57	Specialty Item - 15 GALLON TREE	EA	21	$350.00	$3,850.00	$195.00	$2,145.00	$200.00	$2,200.00	$800.00	$8,800.00	$133.00	$1,463.00	$127.00	$1,397.00
58	Specialty Item - 5 GALLON SHRUB	EA	1,663	$26.00	$43,238.00	$22.00	$36,586.00	$18.00	$29,934.00	$50.00	$83,150.00	$20.00	$33,260.00	$20.00	$33,260.00
59	Specialty Item - 1 GALLON SHRUB	EA	3,653	$12.00	$43,836.00	$11.00	$40,183.00	$8.00	$29,224.00	$13.00	$47,489.00	$11.00	$40,183.00	$11.00	$40,183.00
60	Specialty Item - ROOT BARRIER	LF	2,700	$9.00	$24,300.00	$8.00	$21,600.00	$9.00	$24,300.00	$6.00	$16,200.00	$8.50	$22,950.00	$8.24	$22,248.00
61	Specialty Item - MULCH - 2" THICK	SF	16,400	$0.55	$9,020.00	$0.60	$9,840.00	$0.40	$6,560.00	$2.00	$32,800.00	$0.55	$9,020.00	$0.53	$8,692.00
62	Specialty Item - INSTALL LAWN SOD - MATCH EXISTING	SF	2,100	$3.00	$6,300.00	$2.30	$4,830.00	$3.00	$6,300.00	$6.00	$12,600.00	$1.50	$3,150.00	$1.38	$2,898.00
63	4" THICK DISINTEGRATED GRANITE	SF	375	$10.00	$3,750.00	$4.30	$1,612.50	$9.00	$3,375.00	$26.00	$9,750.00	$4.50	$1,687.50	$5.00	$1,875.00
64	Specialty Item - SOIL PREPARATION & FINE GRADING	SF	16,400	$0.55	$9,020.00	$0.50	$8,200.00	$0.85	$13,940.00	$1.00	$16,400.00	$0.75	$12,300.00	$0.69	$11,316.00
65	Specialty Item - PLACE NON-IRRIGATED HYDROSEED MIX	SF	23,650	$0.20	$4,730.00	$0.30	$7,095.00	$0.15	$3,547.50	$0.70	$16,555.00	$0.20	$4,730.00	$0.16	$3,784.00
66	Specialty Item - 90 WORKING DAY PLANT ESTABLISHMENT AND LANDSCAPE MAINTENANCE PERIOD	LS	1	$8,000.00	$8,000.00	$3,225.00	$3,225.00	$15,000.00	$15,000.00	$30,000.00	$30,000.00	$3,800.00	$3,800.00	$3,725.00	$3,725.00
67	Specialty Item - FURNISH AND INSTALL CONDUIT, 3" DB 60	LF	1,445	$53.00	$76,585.00	$30.00	$43,350.00	$52.00	$75,140.00	$42.00	$60,690.00	$61.00	$88,145.00	$60.00	$86,700.00
68	Specialty Item - FURNISH AND INSTALL CONDUIT, 1.5" DB 60	LF	153	$32.00	$4,896.00	$28.00	$4,284.00	$30.00	$4,590.00	$66.00	$10,098.00	$30.00	$4,590.00	$27.00	$4,131.00
69	Specialty Item - FURNISH AND INSTALL "INTERCEPT" 13x24x24 STREET LIGHT HAND HOLE	EA	2	$1,500.00	$3,000.00	$1,075.00	$2,150.00	$1,150.00	$2,300.00	$3,780.00	$7,560.00	$1,100.00	$2,200.00	$1,056.00	$2,100.00
70	Specialty Item - FURNISH AND INSTALL 13x24x24 STREET LIGHT HAND HOLE	EA	8	$812.00	$6,496.00	$805.00	$6,440.00	$650.00	$5,200.00	$1,425.00	$11,400.00	$832.00	$6,656.00	$800.00	$6,400.00
71	Specialty Item - TRAFFIC SIGNAL MODIFICATIONS & TEMPORARY OVERHEAD WIRING FOR EXISTING TRAFFIC SIGNAL SYSTEM	LS	1	$416,000.00	$416,000.00	$295,000.00	$295,000.00	$346,500.00	$346,500.00	$355,820.00	$355,820.00	$348,000.00	$348,000.00	$316,425.42	$316,425.42
72	Specialty Item - TRAFFIC SIGNAL INTERCONNECT SYSTEM	LS	1	$158,000.00	$158,000.00	$85,000.00	$85,000.00	$168,000.00	$168,000.00	$150,000.00	$150,000.00	$163,000.00	$163,000.00	$149,736.00	$149,736.00
73	Specialty Item - TRAFFIC SIGNING, STRIPING, MARKINGS, AND MARKERS	LS	1	$20,000.00	$20,000.00	$30,000.00	$30,000.00	$45,000.00	$45,000.00	$36,820.00	$36,820.00	$36,000.00	$36,000.00	$30,000.00	$30,000.00
74	PROTECT IN PLACE EXISTING GAS LINES	LS	1	$6,000.00	$6,000.00	$16,000.00	$16,000.00	$3,000.00	$3,000.00	$8,000.00	$8,000.00	$12,000.00	$12,000.00	$1,000.00	$1,000.00
75	FURNISH AND INSTALL "ORANGE" CONSTRUCTION FENCING	LF	2,300	$4.00	$9,200.00	$5.00	$11,500.00	$3.00	$6,900.00	$4.00	$9,200.00	$9.00	$20,700.00	$23.00	$52,900.00
	Total Base Bid Price				$2,643,165.37		$3,287,300.00		$3,388,041.00		$3,643,280.00		$3,824,894.00		$3,967,566.33
	Additive Bid Items														
76	REMOVE AND DISPOSE OF WATER METER	EA	2	$1,000.00	$2,000.00	$5,000.00	$10,000.00	$500.00	$1,000.00	$2,800.00	$5,600.00	$300.00	$600.00	$1,313.00	$2,626.00
77	REMOVE AND DISPOSE OF FIRE HYDRANT	EA	1	$2,000.00	$2,000.00	$7,500.00	$7,500.00	$3,600.00	$3,600.00	$5,500.00	$5,500.00	$3,000.00	$3,000.00	$3,900.00	$3,900.00
78	REMOVE AND DISPOSE OF BLOW-OFF	EA	1	$800.00	$800.00	$6,500.00	$6,500.00	$2,000.00	$2,000.00	$6,900.00	$6,900.00	$3,000.00	$3,000.00	$5,600.00	$5,600.00
79	ADJUST WATER METER TO GRADE	EA	1	$2,000.00	$2,000.00	$1,000.00	$1,000.00	$600.00	$600.00	$4,000.00	$4,000.00	$650.00	$650.00	$365.00	$365.00
80	REMOVE AND REPLACE ALL IRWD WATER VALVE CAN TO GRADE PER IRWD STD W-22 (CANS TO BE SUPPLIED BY IRWD)	EA	7	$829.00	$5,803.00	$1,000.00	$7,000.00	$350.00	$2,450.00	$4,200.00	$29,400.00	$700.00	$4,900.00	$1,550.00	$10,850.00
81	ADJUST IRWD SEWER MANHOLE COVER TO GRADE	EA	1	$3,000.00	$3,000.00	$4,500.00	$4,500.00	$600.00	$600.00	$4,280.00	$4,280.00	$1,200.00	$1,200.00	$1,400.00	$1,400.00
82	ADJUST IRWD RECYCLED WATER MANHOLE TO GRADE	EA	1	$4,150.00	$4,150.00	$4,500.00	$4,500.00	$600.00	$600.00	$4,720.00	$4,720.00	$1,200.00	$1,200.00	$1,400.00	$1,400.00
83	REMOVE AND DISPOSE OF BACKFLOW ASSEMBLY PER IRWD STD W-2	EA	1	$1,850.00	$1,850.00	$7,000.00	$7,000.00	$1,100.00	$1,100.00	$5,380.00	$5,380.00	$730.00	$730.00	$1,400.00	$1,400.00
84	REMOVE AND DISPOSE OF IRWD VENTS	EA	2	$2,000.00	$4,000.00	$5,500.00	$11,000.00	$5,300.00	$10,600.00	$3,350.00	$6,700.00	$2,222.00	$4,444.00	$1,400.00	$2,800.00
85	FURNISH AND INSTALL FIRE HYDRANT ASSEMBLY PER IRWD STD W-8	EA	1	$16,800.00	$16,800.00	$18,500.00	$18,500.00	$10,000.00	$10,000.00	$10,550.00	$10,550.00	$11,760.00	$11,760.00	$18,000.00	$18,000.00
86	FURNISH AND INSTALL 2" REDUCE PRESSURE PRINCIPAL BACK FLOW ASSEMBLY PER IRWD STD W-7	EA	1	$14,850.00	$14,850.00	$18,500.00	$18,500.00	$1,250.00	$1,250.00	$13,850.00	$13,850.00	$3,900.00	$3,900.00	$10,389.87	$10,389.87
87	FURNISH AND INSTALL 2" SERVICE AND METER PER IRWD STD W-2	EA	1	$11,800.00	$11,800.00	$15,000.00	$15,000.00	$5,250.00	$5,250.00	$9,780.00	$9,780.00	$7,350.00	$7,350.00	$17,000.00	$17,000.00
88	FURNISH AND INSTALL 2" TWO WIRE CATHODIC PROTECTION TEST STATION PER IRWD STD CP-1	EA	1	$12,800.00	$12,800.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$8,215.00	$8,215.00	$6,800.00	$6,800.00	$8,500.00	$8,500.00
89	FURNISH AND INSTALL VAULT VENT ASSEMBLY IRWD STD G-7	EA	2	$1,800.00	$3,600.00	$10,000.00	$20,000.00	$14,000.00	$28,000.00	$5,500.00	$11,000.00	$10,800.00	$21,600.00	$10,500.00	$21,000.00
90	FURNISH AND INSTALL 4" BLOWOFF/BOTTOM DRAIN ASSEMBLY PER IRWD STD W-14	EA	1	$6,500.00	$6,500.00	$14,000.00	$14,000.00	$26,600.00	$26,600.00	$30,000.00	$30,000.00	$19,000.00	$19,000.00	$26,500.00	$26,500.00
91	FURNISH AND INSTALL 12" PVC C 900 WITH COUPLING PER IRWD STD W-19	LF	19	$292.00	$5,548.00	$5,000.00	$95,000.00	$1,200.00	$22,800.00	$550.00	$10,450.00	$435.00	$8,265.00	$1,063.00	$20,197.00
92	FURNISH AND INSTALL 6" RESILIENT WEDGE GATE VALVE ASSEMBLY PER IRWD STD W-22	EA	2	$2,500.00	$5,000.00	$6,000.00	$12,000.00	$9,500.00	$19,200.00	$14,900.00	$29,800.00	$2,111.00	$4,222.00	$12,600.00	$25,200.00
	Total Additive Bid Items				$105,291.00		$262,000.00		$145,650.00		$196,125.00		$102,621.00		$176,577.87

EXHIBIT "F"

File No.

REIMBURSEMENT AGREEMENT BETWEEN
IRVINE RANCH WATER DISTRICT
AND THE CITY OF IRVINE
FOR
CULVER DRIVE AND UNIVERSITY DRIVE INTERSECTION IMPROVEMENTS
CIP NO. 318030

This Agreement is made and entered into as of this ____ day of _____, 2018, by and between IRVINE RANCH WATER DISTRICT, a California water district formed and existing pursuant to the California Water District Law, hereinafter referred to as "DISTRICT," and the CITY OF IRVINE, a municipal corporation, hereinafter referred to as "CITY."

W I T N E S S E T H:

WHEREAS, CITY proposes to construct the Culver Drive and University Drive Intersection Improvements, CIP 318030 (the "Project"), within the jurisdictional boundaries of DISTRICT and the City of Irvine; and

WHEREAS, such construction will necessitate the adjustment to grade of 2 Manholes, and removal and installation of 1 Fire Hydrant, 7 Water Valve Cans, 1 Backflow Assembly, 2 Vault Vents, 1 Domestic Water Meter, 1 Cathodic Protection Test Station, , 1 Blowoff Assembly, and 2 Gate Valves as depicted on Exhibit "A" attached hereto incorporated by reference herein (hereinafter referred to as the "IRWD FACILITIES"); and

WHEREAS, the parties have determined that it would be more expedient for CITY to construct the IRWD FACILITIES rather than for DISTRICT to do so; and

WHEREAS, DISTRICT is amenable to the CITY constructing the IRWD FACILITIES with the CITY agreeing to advance the costs; and

WHEREAS, DISTRICT agrees to fully reimburse the CITY through payments billed by the CITY and approved by DISTRICT for the entire cost of the IRWD FACILITIES; and

WHEREAS, except as otherwise provided herein, upon the completion of the IRWD FACILITIES, the IRWD FACILITIES shall become the property of DISTRICT in accordance with the terms and conditions hereinafter set forth.

NOW, THEREFORE, in consideration of the mutual promises and covenants hereinafter set forth, the parties hereto agree as follows:

SECTION 1. IRWD FACILITIES. In conjunction with the Project, CITY agrees to initiate and pursue to completion the design and construction of the IRWD FACILITIES.

SECTION 2. PLANS. CITY agrees that the IRWD FACILITIES shall be completed pursuant to approved project plans and specifications (the "Plans and Specifications") which shall be approved by DISTRICT and used in awarding the construction contract. Prior to commencement of preparation of the Plans and Specifications, CITY shall submit its design engineer's proposal for the design of the IRWD FACILITIES to DISTRICT. DISTRICT will have a period of five (5) calendar days from its receipt of such design proposal to review and either indicate its approval or request changes. CITY shall cause its design engineer to review and respond to any requested changes. The Plans and Specifications shall be deemed to incorporate the applicable portions of DISTRICT's latest edition of "Construction Manual for the Construction of Water, Sewer, and Reclaimed Water Facilities" (the "Construction Manual"). The IRWD FACILITIES shall be contracted by CITY together with non-reimbursable work to be completed by CITY within the Project pursuant to plans prepared by CITY's design engineer.

SECTION 3. BIDDING AND AWARD. The parties agree that the construction of the IRWD FACILITIES shall be included in CITY's contract(s) awarded for the Project and that the IRWD FACILITIES shall be bid as a separate item or items that can be deleted. During the bidding process, CITY shall deliver to IRWD one (1) complete set of the bid documents that include the IRWD FACILITIES, including all related addenda concurrently with the distribution thereof to prospective bidders. Upon opening of bids by CITY, CITY will submit the bids or a spread sheet summary of the bids to DISTRICT. DISTRICT will have a period of ten (10) calendar days from its receipt of the bid results for review and approval of the IRWD FACILITIES bid item(s) submitted by the bidder identified to DISTRICT by CITY as CITY's proposed successful bidder. CITY agrees that bids received for the construction of the IRWD FACILITIES bid item(s) shall be subject to the approval of DISTRICT prior to award of the Project construction contract(s) that include the IRWD FACILITIES; and further agrees that in the event DISTRICT does not approve such bids, either party may terminate this Agreement

upon twenty-four (24) hours' prior written notice, in which event CITY shall have no further obligation to construct the IRWD FACILITIES, and DISTRICT may elect to install the IRWD FACILITIES with its own contractor. If DISTRICT approves of the IRWD FACILITIES bid item(s) of CITY's successful bidder, CITY agrees to cause the IRWD FACILITIES to be constructed as part of the contract awarded to such bidder. The total estimated construction cost for the IRWD FACILITIES is $272,480.00, provided, however, the amount to be reimbursed by DISTRICT shall be based on the actual costs of construction. Upon award of the construction contract, CITY shall provide DISTRICT with one (1) original copy of the fully executed contract documents and one (1) copy of the bid package relating to the IRWD FACILITIES received from the successful bidder.

SECTION 4. DESIGN REVISIONS AND CHANGE ORDERS. DISTRICT agrees to reimburse CITY for any change order(s) for revision(s) requested by DISTRICT or otherwise required to construct the IRWD FACILITIES. CITY shall promptly furnish DISTRICT with copies of any proposed change order(s) to such contract within five (5) working days of the initiation of the changed conditions to such contract, which shall be subject to DISTRICT approval if and to the extent the IRWD FACILITIES are affected therefrom.

DISTRICT shall promptly review proposed change order(s) and provide CITY with a response within five (5) working days or sooner of receiving proposed change order(s) information from CITY. DISTRICT agrees not to unreasonably cause delay(s) to the construction schedule of the Project in reviewing proposed change order(s) for the IRWD FACILITIES. Notwithstanding any other provision herein, any approval required to be given by the DISTRICT under this Section shall be deemed given if no response to the CITY's request for such approval is received by the CITY within eight (8) working days following the written request for such approval unless the parties agree otherwise in a writing executed by both parties.

SECTION 5. REIMBURSEMENT. DISTRICT agrees to reimburse CITY for the following costs (collectively, the "Costs"): (1) the actual costs of design, construction, permits, bonds, and legal fees (excluding the costs of preparation of this Agreement) incurred by CITY in connection with the design and construction of the IRWD FACILITIES, plus (2) an administration fee which shall be equal to four percent (4%) of the actual cost of construction (costs paid directly to CITY's contractor for construction, only, excluding any cost for design, surveying, geotechnical or other work) of the IRWD FACILITIES and which shall be deemed to cover all costs of project administration, including, but not limited to, accounting, inspection,

surveying, compaction testing, geotechnical services and engineering. CITY shall keep a separate accounting of all Costs incurred by CITY in relation to the IRWD FACILITIES.

Within sixty (60) days of DISTRICT's acceptance of the IRWD FACILITIES as provided in Section 8, a final accounting of the Costs shall be made by CITY and submitted to DISTRICT along with an invoice for the Costs and any supporting documentation necessary to show the amounts which represent Costs of IRWD FACILITIES. Amounts paid pursuant to progress payment invoices shall be subject to adjustment in the final accounting. Within thirty (30) days of said final accounting, DISTRICT agrees to pay to CITY the total amount of the Costs.

SECTION 6. LAWS, ORDINANCES, RULES AND REGULATIONS. CITY shall require in its contract for the construction of the IRWD FACILITIES that its contractor be fully informed of and comply with all laws, ordinances, rules and regulations, including, but not limited to, all applicable requirements of the California Labor Code, prevailing wage laws, the Construction Manual, and the Rules and Regulations of DISTRICT, in connection with the construction of the IRWD FACILITIES.

SECTION 7. INSPECTION. DISTRICT shall have sole and absolute discretion as to all aspects of design and construction of the IRWD FACILITIES, and DISTRICT shall be entitled to inspect the construction of IRWD FACILITIES as it deems necessary to assure compliance with the Plans and Specifications, including shop drawing review and material inspection thereof. DISTRICT shall have access to all phases of the Project work to be performed by CITY for the purpose of such inspection; provided, however, all questions regarding the work being performed will be directed to CITY's resident engineer. DISTRICT will promptly notify CITY of any portion of the work on the IRWD FACILITIES which appears not to conform to the Plans and Specifications. The determination of DISTRICT as to conformity of the IRWD FACILITIES with the Plans and Specifications shall be made in DISTRICT's sole and absolute discretion. DISTRICT agrees not to unreasonably withhold its approval as to such conformity of the IRWD FACILITIES with the Plans and Specifications. CITY shall require its contractor to construct the IRWD FACILITIES so that the IRWD FACILITIES conform to the Plans and Specifications. CITY agrees to assume full responsibility for certifying or obtaining certification of the compaction of backfill material over the IRWD FACILITIES.

SECTION 8. ACCEPTANCE. DISTRICT agrees to accept the IRWD FACILITIES when the IRWD FACILITIES have been completed by CITY in accordance with all

requirements of the Plans and Specifications, including any change orders approved by DISTRICT as provided in Section 3 hereof. At the time of completion and acceptance of the IRWD FACILITIES, CITY agrees to furnish DISTRICT with one (1) copy of the contractor's redlined set of "record" drawings (showing all revisions, manufacturer and type of valves, pipe and fittings as required by DISTRICT) and one (1) copy of the compaction reports and certificate, survey notes and cut sheets.

SECTION 9. OWNERSHIP. It is mutually agreed between the parties hereto that notwithstanding the fact that CITY shall accomplish the construction of the IRWD FACILITIES subject to reimbursement, the IRWD FACILITIES to be completed hereunder, together with the necessary franchises, licenses, easements, rights-of-way, and other privileges, shall at all times be subject to the applicable rates, rules and regulations of DISTRICT, as modified or amended from time to time. CITY hereby disclaims any interest in the IRWD FACILITIES and does hereby transfer and assign to DISTRICT any and all right, title, and interest it may have in the IRWD FACILITIES. DISTRICT shall own, operate and maintain the IRWD FACILITIES following acceptance thereof.

SECTION 10. GUARANTEES. CITY will, pursuant to the requirement(s) of the Plans and Specifications, cause its contractor(s) for the IRWD FACILITIES to guarantee the IRWD FACILITIES against defects in workmanship and materials for a period of one (1) year from the date of acceptance by CITY, which acceptance shall be given only after acceptance by DISTRICT as provided in Section 8. It is further agreed that CITY shall cause the IRWD FACILITIES to be brought or restored to full compliance with the requirements of the Plans and Specifications, including any test requirements, for any portions of the IRWD FACILITIES which during said one (1) year period are found not to be in conformance with the provisions of the Plans and Specifications. This guarantee is in addition to any and all other warranties, express or implied, from CITY's contractors or material manufacturers, with respect to the IRWD FACILITIES. The guarantee and obligations under this section shall in no way be relieved by DISTRICT's inspection and/or acceptance of the IRWD FACILITIES. This section sets forth the entire guarantee and warranty of CITY with respect to the IRWD FACILITIES. The express or implied warranties of other persons with respect to IRWD FACILITIES shall in no way be limited by the guarantee and warranty of CITY contained in this section. If requested by DISTRICT, CITY agrees to assign to DISTRICT the contractor's guarantee and/or any other guarantees or warranties relating to the IRWD FACILITIES.

SECTION 11. INDEMNIFICATION. CITY shall indemnify, defend and hold DISTRICT, its officers, agents, employees, and engineers harmless from any expense, liability or claim for death, injury, loss, damage or expense to persons or property which may arise or is claimed to have arisen during construction of the IRWD FACILITIES as a result of any work or action performed by CITY or on behalf of CITY, save and except to the extent such expense, liability or claim is proximately caused in whole or in part by any act, omission, or negligence of DISTRICT, its officers, agents, employees or engineers or by any act or omission for which DISTRICT, its officers, agents, employees or engineers are liable without fault.

DISTRICT shall indemnify, defend and hold CITY, its officers, agents, and employees, harmless from any expense, liability or claim for death, injury, loss, damage or expense to persons or property which may arise or is claimed to have arisen either (i) as a result of any acts performed by DISTRICT, its officers, agents, or employees, with respect to the IRWD FACILITIES construction; or (ii) following DISTRICT acceptance of the IRWD FACILITIES, with respect to maintenance and operation of the IRWD FACILITIES, save and except to the extent such expense, liability or claim is proximately caused in whole or in part by any negligence of CITY, its officers, agents, employees or engineers, or by any act or omission for which CITY, its officers, agents, employees or engineers are liable without fault.

SECTION 12. INSURANCE AND BONDING. CITY shall cause its contractor(s) to provide performance and payment bonds for the construction of the Project including the IRWD FACILITIES and to obtain insurance coverage sufficiently broad to insure the matters set forth in this Agreement and to include DISTRICT, its officers, agents, employees and engineers, as additional insureds on all insurance policies that CITY requires its contractor(s) to provide. As evidence of such insurance coverage, CITY shall, prior to commencement of construction of the IRWD FACILITIES, provide DISTRICT with certificates of insurance and insurance endorsements from CITY's contractor(s) in a form acceptable to DISTRICT.

SECTION 13. TERMINATION. DISTRICT shall have the right to terminate this Agreement at any time, subject to the provisions of this section, by providing five (5) business days' prior written notice to CITY, except as noted in Section 3. If at the request or direction of a party other than CITY, the construction of the IRWD FACILITIES is not accomplished or completed, DISTRICT shall remain obligated for the actual amount of the Costs incurred by CITY to the date of termination.

If CITY's Project is canceled or modified so as to eliminate the necessity of the construction of the IRWD FACILITIES, CITY shall have the right to terminate this Agreement and thereby terminate its obligation to construct the IRWD FACILITIES, by providing five (5) business days' prior written notice to DISTRICT. In such case, DISTRICT will not be obligated for any design or any other Costs incurred by CITY. If IRWD elects to construct the IRWD FACILITIES, DISTRICT may, but shall not be obligated to, acquire the design or other work from CITY by separate agreement.

SECTION 14. NOTICE. Any notice or other written instrument required or permitted by this Agreement to be given to either party shall be deemed received when personally served or twenty-four (24) hours after being deposited in the U.S. Mail, postage prepaid, registered or certified and addressed as follows:

DISTRICT: Irvine Ranch Water District
15600 Sand Canyon Avenue
P.O. Box 57000
Irvine, CA 92619-7000
Attn: General Manager

CITY: City of Irvine
Public Works Department
6427 Oak Canyon
Irvine, CA 92618
Attn: Steve Ollo, Senior Civil Engineer

SECTION 15. SUCCESSORS AND ASSIGNS; INTEGRATION; AMENDMENT. This Agreement shall be binding upon and inure to the benefit of the successor and assigns of CITY and DISTRICT. This Agreement constitutes the entire Agreement between CITY and DISTRICT and supersedes all prior understandings and agreements between the parties with respect to the subjects hereof. This Agreement may be modified only in writing signed by both parties hereto.

SECTION 16. LEGAL FEES. In the event of any declaratory or other legal or equitable action instituted between CITY and DISTRICT in connection with this Agreement, the prevailing party shall be entitled to recover from the losing party all of its costs and expenses, including court costs and reasonable attorneys' fees.

SECTION 17. DEEMED APPROVAL. Any approval required to be given by either party pursuant to this Agreement shall be deemed given if no response to the party's request for

such approval is received by the requesting party within fifteen (15) days following the written request for such approval.

SECTION 18. SEVERABILITY. If any term, provision, covenant or condition of this Agreement is held to be invalid, void or other unenforceable, to any extent, by any court of competent jurisdiction, the remainder of this Agreement shall not be affected thereby, and each term provision, covenant or condition of this Agreement shall be valid and enforceable to the fullest extent permitted by law.

SECTION 19. APPLICABLE LAW. This Agreement shall be construed and enforced in accordance with the laws of the State of California.

SECTION 20. WAIVER. The waiver of any provision of this Agreement by either party shall not be deemed to be a waiver of any other provision or of any preceding or subsequent breach hereunder.

IN WITNESS WHEREOF, the parties to the Agreement have executed this Agreement on the date herein above written.

IRVINE RANCH WATER DISTRICT

By_____ Dated _____
Paul Cook, General Manager

ATTEST:

By_____ Dated _____
Secretary/Assistant Secretary

APPROVED AS TO FORM:

By_____ Dated _____
Legal Counsel, IRWD

CITY OF IRVINE
A Municipal Corporation

By_____ Dated _____
Grace Leung
Acting City Manager of the City of Irvine

By_____ Dated _____
Manuel Gomez
Director of Public Works

ATTEST:

By_____ Dated _____
Molly McLaughlin
City Clerk of the City of Irvine

APPROVED AS TO FORM:

By_____ Dated _____
Jeffrey Melching, RUTAN & TUCKER, LLP
City Attorney of the City of Irvine

EXHIBIT "A"

REIMBURSEMENT AGREEMENT BETWEEN IRVINE RANCH WATER DISTRICT (IRWD)
AND THE CITY OF IRVINE
FOR
CULVER DRIVE AND UNIVERSITY DRIVE INTERSECTION IMPROVEMENTS
CIP NO. 318030

ENGINEERS ESTIMATE

ITEM NO.	DESCRIPTION	QUANTITY	UNITS	UNIT COST	EXTENDED AMOUNT
76	REMOVE AND DISPOSE OF WATER METER	2	EA	$ 5,000.00	$ 10,000.00
77	REMOVE AND DISPOSE OF FIRE HYDRANT	1	EA	$ 7,500.00	$ 7,500.00
78	REMOVE AND DISPOSE OF BLOW-OFF	1	EA	$ 6,500.00	$ 6,500.00
79	ADJUST WATER METER TO GRADE	1	EA	$ 1,000.00	$ 1,000.00
80	REMOVE AND REPLACE ALL IRWD WATER VALVE CANS TO GRADE PER IRWD SRD W-22 (CANS TO BE SUPPLIED BY IRWD)	7	EA	$ 1,000.00	$ 7,000.00
81	ADJUST IRWD SEWER MANHOLE COVER TO GRADE	1	EA	$ 4,500.00	$ 4,500.00
82	ADJUST IRWD RECYCLED WATER MANHOLE TO GRADE	1	EA	$ 4,500.00	$ 4,500.00
83	REMOVE AND DISPOSE OF BACKFLOW ASSEMBLY PER IRWD STD W-2	1	EA	$ 7,000.00	$ 7,000.00
84	REMOVE AND DISPOSE OF IRWD VENTS	2	EA	$ 5,500.00	$ 11,000.00
85	FURNISH AND INSTALL FIRE HYDRANT ASSEMBLY PER IRWD STD W-8	1	EA	$18,500.00	$ 18,500.00
86	FURNISH AND INSTALL 2" REDUCE PRESSURE PRINCIPAL BACK FLOW ASSEMBLY PER IRWD STD W-7	1	EA	$18,500.00	$ 18,500.00
87	FURNISH AND INSTALL 2" SERVICE AND METER PER IRWD STD W-2	1	EA	$15,000.00	$ 15,000.00
88	FURNISH AND INSTALL 2" TWO WIRE CATHODIC PROTECTION TEST STATION PER IRWD STD CP-1	1	EA	$10,000.00	$ 10,000.00
89	FURNISH AND INSTALL VAULT VENT ASSEMBLY IRWD STD G-7	2	EA	$10,000.00	$ 20,000.00
90	FURNISH AND INSTALL 4" BLOWOFF/BOTTOM DRAIN ASSEMBLY PER IRWD STD W-14	1	EA	$14,000.00	$ 14,000.00
91	FURNISH AND INSTALL 12" PVC C 900 WITH COUPLING PER IRWD STD W-19	19	LF	$ 5,000.00	$ 95,000.00
92	FURNISH AND INSTALL 6" RESILIENT WEDGE GATE VALVE ASSEMBLY PER IRWD STD W-22	2	EA	$ 6,000.00	$ 12,000.00
				TOTAL CONSTRUCTION ESTIMATE	$ 262,000.00
				4% ADMINISTRATION FEE PER SECTION 5 OF AGREEMENT	$ 10,480.00
				TOTAL COSTS	$ 272,480.00

July 17, 2018
Prepared by: J. Smyth/M. Cortez
Submitted by: K. Burton
Approved by: Paul A. Cook

ENGINEERING AND OPERATIONS COMMITTEE

TURTLE RIDGE PIPELINES CATHODIC PROTECTION CONSULTANT SELECTION

SUMMARY:

There have been corrosion-related leaks on the 10-inch ductile iron recycled water and 16-inch ductile iron domestic water mains in Turtle Ridge in 2014 and 2016, respectively, due to severely corrosive soil conditions. This project will design cathodic protection for the pipelines. Staff recommends that the Board authorize the General Manager to execute a Professional Services Agreement with V&A Engineering in the amount of $138,909 for the Turtle Ridge Pipelines Cathodic Protection.

BACKGROUND:

In August 2016, there was a corrosion leak on the 16-inch ductile iron domestic water main in Turtle Ridge. A similar corrosion-related leak was repaired on the parallel 10-inch ductile iron recycled water main in 2014. The cause of the corrosion was investigated by HDR and determined to be due to severely corrosive soil conditions.

Staff retained Psomas/V&A Engineering (V&A) to prepare a Preliminary Design Report (PDR) with conceptual designs for the rehabilitation, replacement, or cathodic protection of the 16-inch domestic and 10-inch recycled water pipes in Turtle Ridge Drive from Bonita Canyon Drive to Summit Park Drive. The PDR recommended installing cathodic protection on the pipelines.

Staff retained V&A to complete a PDR to determine cathodic protection current requirements, evaluate system options, test pipeline electrical continuity, and test isolation from other pipelines. The Final PDR was submitted in June and V&A is recommending installation of an impressed current cathodic protection system with one rectifier, insulating flanges, joint bonding, and test stations.

Consultant Selection:

At staff's request, V&A submitted a proposal in the amount of $138,909 to design the cathodic protection system and provide construction phase services during installation. Locating discontinuous joints for bonding and finding buried insulating flanges, which were not indicated on as-built documents, to confirm effectiveness is an iterative process requiring extensive investigation and potholing. Over one-third of the design cost, $55,000, is budgeted for these prerequisite items of work for the final design of the cathodic protection system.

Staff reviewed V&A's proposal, attached as Exhibit "A", and finds the costs to be fair and reasonable. Based on V&A's responsive performance and its background knowledge on the cathodic issues in Turtle Ridge gained through completing the PDR, staff recommends awarding a Professional Services Agreement to V&A to complete the final design.

FISCAL IMPACTS:

Projects 07888 and 07889 are included in the FY 2018-19 Capital Budget. The existing budgets are sufficient to fund the work.

ENVIRONMENTAL COMPLIANCE:

This project is exempt from the California Environmental Quality Act (CEQA) as authorized under the California Code of Regulations, Title 14, Chapter 3, Section 15301 which provides exemption for minor alterations of existing public or private structures, facilities, mechanical equipment, or topographical features, involving negligible or no expansion of use beyond that existing at the time of the lead agency's determination. A Notice of Exemption for the project was filed with the County of Orange on May 18, 2017.

RECOMMENDATION:

That the Board authorize the General Manager to execute a Professional Services Agreement with V&A Engineering in the amount of $138,909 for the Turtle Ridge Pipelines Cathodic Protection, Projects 07888 and 07889.

LIST OF EXHIBITS:

Exhibit "A" – V&A Engineering's Proposal

EXHIBIT "A"

V&A

11011 Via Frontera
Suite C
San Diego, CA 92127

858.578.0228 Tel
510.903.6601 Fax
vaengineering.com

V&A Project No. 17-0350B Rev02

July 10, 2018

Jeff Smyth, P.E.
Project Manager
Irvine Ranch Water District
3512 Michelson Drive
Irvine, CA 92612

Subject: Turtle Ridge Drive Cathodic Protection System Design and Construction Phase Services
Proposal for Corrosion Engineering Services

Dear Mr. Smyth:

Thank you for requesting a proposal from V&A Consulting Engineers, Inc. (V&A) for design and engineering services during the construction phase of a cathodic protection (CP) system to provide corrosion control to Irvine Ranch Water District's (IRWD) domestic waterline (DW) and recycled waterline (RW) installed along Turtle Ridge Drive located in Irvine, CA. The DW consists of 1,780-feet of 16-inch diameter ductile iron pipe (DIP) and the RW consists of 1,870-feet of 10-inch diameter DIP. Based on information provided by IRWD, both pipelines have short segments that are cement mortar lined and coated (CML&C) steel pipe (exact locations are unknown at this time). Both pipelines have experienced a blowout due to corrosion within the last 36 months.

V&A performed a corrosion investigation of the pipelines in March 2018. The investigation consisted of performing soil corrosivity testing, current requirement testing, electrical isolation testing, and electrical continuity testing. During the field investigation, it was determined that the pipelines are electrically isolated between Bonita Canyon Drive and Station 15+00.00. The location of the discontinuities must be determined and the discontinuities repaired prior to the installation of an effective cathodic protection system.

It is V&A's understanding that the pipelines change material from CML&C steel pipe to ductile iron pipe south of Bonita Canyon Drive; the pipe materials are intended to be electrically isolated at the connection point via an insulating flange kit. V&A will review available documents pertaining to the installation of the insulating flange kits in preparation to performing potholing in order to determine the location of the insulating flange kits. At the completion of the additional field investigations, V&A is prepared to design a CP system for the project pipelines and provide engineering services during the construction phase of the project.

Per your request, the following is our proposal and detailed scope of work for the subject services:

Scope of Work

Task | Description

1. **Project Management:** The objective of this task is to track and execute the project in accordance with the schedule, budget, and quality expectations that are established. This task includes the following project management work activities:
    a. Monitor project progress, including work completed, work remaining, budget expended, schedule, estimated cost of work remaining, and estimated cost at completion; manage activities within total project budget.

b. Monitor project activities for potential changes and anticipate changes whenever possible; with approval, modify project tasks, task budgets, and approach to keep the overall project within budget and on schedule.

c. Manage the quality of all work activities and project deliverables.

d. Attend one (1) kickoff meeting.

2. **Insulating Flange Kit and Discontinuity Investigation:** Identify locations of all discontinuities for future repair. Review available IRWD documents (including as-built drawings, pipe lay drawings, and contractor daily work logs) pertaining to the location of the insulating flange kits and transition of pipe materials south of Bonita Canyon Drive. Submit a potholing plan to IRWD for approval. A maximum of 20 potholes will be performed over a four-day period to determine the location of the insulating flange kits and other discontinuities for future repair. Potholing will be performed by Cardno; a representative from V&A will be on-site during the potholing to observe the work. The project Preliminary Design Report will be revised to include the results of the document review and potholing.

3. **CP System Drawings, Specifications, Project Manual and Engineering Opinion of Probable Cost:** Prepare drawings, technical specification Section 16640 "Cathodic Protection," project manual, and an engineering opinion of probable cost for the CP system. Plans will be prepared in AutoCAD and will include civil details for the installation of isolation flanges. Plans, specifications and cost estimates will be prepared for the 70%, 90%, and 100% submittals. Five (5) copies of 24-inch x 36-inch bonded hard copies will be provided at each submittal and one (1) copy of 24-inch x 36-inch mylar drawings will be provided at the final submittal. One round of comments will be addressed at each submittal (70%, 90%, and 100%). V&A will attend a workshop following each submittal to review District comments. If more submittals are requested, submittals will be invoiced on a time and materials basis at the rates shown on the attached Resource Allocation Estimate.

   Prepare a Project Manual in standard IRWD format. A set of bidding documents will be provided in 8.5-inch x 11-inch format. Computer files of the Project Manual shall be submitted to IRWD in the latest version of Microsoft Word. The Project Manual shall also be submitted to IRWD as a single PDF file.

   The bid package will be prepared by V&A and advertised by IRWD.

4. **Construction Phase Services:** Attend up to four project meetings of one hour each and conduct five site visits of two hours each during the construction phase of the project. Meeting minutes for the conference calls shall be submitted. The construction window for the installation of CP system components shall be reviewed with IRWD Systems Operations and Construction Services staff to discuss the procedures for installation.

   Review and respond to up to 10 contractor submittals (including re-submittals) and three RFIs for the CP system. The review of additional contractor submittals and RFIs will be invoiced on a time and materials basis at the rates shown on the attached Resource Allocation Estimate.

   Prepare base maps in AutoCAD using the CAD base maps provided by IRWD to show existing piping, pertinent above grade features identified during the field testing, pertinent below grade features identified during the potholing, and the recommended locations of CP system components. The Engineer shall provide up to 30 hours to perform minor plan revisions to the construction drawings.

   Apply for and obtain encroachment permits from the related jurisdictional agencies for the installation of the CP system and its associated components. This includes attending up to two conference calls with the agencies as needed to resolve items throughout the permit approval process. V&A will prepare the Traffic Control Plans that are deemed necessary by the requirements of the Permit for inclusion into the Drawings and Specifications of the Project. V&A will pay for permit application fees; the cost of the permits will be paid directly by IRWD to the permitting agency.

Prepare record drawings on 24-inch by 36-inch mylars at the completion of construction using the Contractor's and District Inspector's red-lines. Final record drawing mylars, AutoCAD electronic files, and a single-color PDF of the Final as-built mylars shall be submitted to IRWD at the completion of construction. Certificates of integrity and functionality of test stations, insulators, and the CP system shall be submitted upon completion of construction. The certificate shall include a list of all verified test stations, insulators, and cathodic protection systems.

V&A proposes to complete this work on a time and materials basis at a total cost not to exceed **$138,909** with terms of net 60 days. This fee is valid for 90 days from the date of this proposal. The scope of work was developed as a result of our discussions and represents our mutual understanding.

Estimated costs for the above project scope are itemized in the attached Resource Allocation Estimate. These costs represent our best estimate at this time and may change subject to future developments during the project. It is possible that some of the estimated manpower requirements for specific task items may increase while others may not require the entire anticipated effort. This provides us a greater degree of confidence in the overall project estimate, rather than in any given particular task.

If unforeseen circumstances should arise which indicate that more time is required, V&A will provide a written estimate of additional required time and cost. V&A will not proceed with work beyond the not-to-exceed figure without a written authorization from your office. Charges to this project will be made for actual time spent on the project and will be charged as per the attached Resource Allocation Estimate. We request that you carefully review this proposal to assure full understanding of the scope of the work. Our Fee Schedule is adjusted annually in January. Fees will be adjusted at that time and a new Fee Schedule will be sent. Charges on the remainder of the project will be based on the new schedule.

We are prepared to begin work on your project upon receiving written approval, a notice to proceed (NTP), or a purchase order from your office.

On behalf of our staff and myself, I would like to thank you for the opportunity to be of service to you and Irvine Ranch Water District. We look forward to working with you.

Sincerely,
V&A Consulting Engineers, Inc.

Debra Kaye, P.E.
President

Accepted: _____ Date: _____
Irvine Ranch Water District

V&A

11011 Via Frontera
Suite C
San Diego, CA 92127

858.578.0228 Tel
510.903.6601 Fax
vaengineering.com

RESOURCE ALLOCATION ESTIMATE

JOB NO: 17-0350B Rev02 Date: 7/10/2018

CLIENT: Irvine Ranch Water District

JOB TITLE: Turtle Ridge Drive Design and Construction Phase Services

Task	Description	Principal-In-Charge	Sr. Project Manager	Project Manager	Associate Engineer	CADD Designer	Engineering Assistant	Project Admin/ Clerical	Total
1	Project Management	2	6	24	2			20	54
2	Insulating Flange Kit Investigation	4	4	16	56		68		148
3	CP System Drawings, Specifications, Project Manual and Engineering Opinion of Probable Cost	4	4	40	60	40			148
4	Construction Phase Services	8	8	56	80	30	84		266
	Subtotal	18	22	136	198	70	152	20	616
	Hourly	$297	$259	$232	$173	$141	$130	$86	
	Total Direct Labor	$5,346	$5,698	$31,552	$34,254	$9,870	$19,760	$1,720	$108,200
	Other Direct Costs							Amount	
	Truck		$85	per Day		17	Days	$1,445	
	Mileage		$0.535	per Mile		2,550	Miles	$1,364	
	Potholing		$24,000	At Cost + 10%				$26,400	
	Office Expenses/Printing/Reproduction							$1,500	
	Subtotal Other Direct Costs								$30,709
	GRAND TOTAL ESTIMATED COST								**$138,909**