Yucaipa Valley Water District

12770 Second Street, Yucaipa, California 92399 Phone: (909) 797-5117

Notice and Agenda of a Meeting of the Board of Directors

Tuesday, February 23, 2021 at 4:00 p.m.

Due to the spread of COVID-19 and in accordance with the Governor's Executive Order N-29-20 (a copy of which is attached to this agenda), the Yucaipa Valley Water District will be conducting this meeting by teleconference only. Public comments on matters listed on the agenda or on any matter within the District's jurisdiction will be received during Public Comments, Agenda Item No. III.

This meeting is available by calling (888) 475-4499
Meeting ID: 676-950-731#

Participate in the meeting online at
https://zoom.us/j/676950731
Passcode: 765589

There will be no public physical location for attending this meeting in person. The District's Board meeting room will be closed to the public until further notice.

If you are unable to participate by telephone, you may submit comments and/or questions in writing for the Board's consideration by sending them to inquiry@yvwd.us. Submit your written inquiry prior to the start of the meeting. All public comments received prior to the start of the meeting will be provided to the Board and may be read into the record or compiled as part of the record.

I. CALL TO ORDER

II. ROLL CALL

III. PUBLIC COMMENTS - At this time, members of the public may briefly address the Board of Directors on matters within its jurisdiction or on any matter listed on this agenda.

Any person who requires accommodation to participate in this meeting should contact the District office at (909) 797-5117, at least 48 hours prior to the meeting to request a disability-related modification or accommodation.

Materials that are provided to the Board of Directors after the meeting packet is compiled and distributed will be made available for public review during normal business hours at the District office located at 12770 Second Street, Yucaipa. Meeting materials are also available on the District's website at www.yvwd.dst.ca.us

IV. CONSENT CALENDAR - All consent calendar matters are routine and will be acted upon in one motion. There will be no discussion of these items unless board members, administrative staff, or members of the public request specific items to be discussed and/or removed prior to the vote for approval.

A. Minutes of Meetings

1. Board Meeting - February 16, 2021

B. Payment of Bills

1. Approve/Ratify Invoices for Board Awarded Contracts
2. Ratify General Expenses for January 2020

V. STAFF REPORT

VI. DISCUSSION ITEMS

A. Adoption of the 2021 Strategic Priorities, Goals and Objectives [Director Memorandum No. 21-029 - Page 20 of 106]

RECOMMENDED ACTION: That the Board, by minute order, adopt the 2021 strategic planning priorities.

B. Discussion Regarding the Preparation of a Request for Proposals to Provide Financial Advisory Services [Director Memorandum No. 21-030 - Page 25 of 106]

RECOMMENDED ACTION: That the Board, by minute order, directs the General Manager to prepare a Request for Proposals for Financial Advisory Services for funding sewer and recycled water Capital Improvement Projects.

C. Consideration of Injection Well Design, Construction Management, and Inspection Services from Geoscience Support Services [Director Memorandum No. 21-031 - Page 31 of 106]

RECOMMENDED ACTION: That the Board (1) authorizes the General Manager to issue a Notice to Proceed with Geoscience to perform professional hydrogeological services for the design, construction management, and inspection services for injection and monitoring wells for the Aquifer Storage and Recovery Project for a sum not to exceed $450,818, and (2) adopt Resolution No. 2021-11.

D. Consideration of Participating in the Preparation of a Salt and Nutrient Plan for the Bunker Hill Groundwater Basin [Director Memorandum No. 21-032 - Page 60 of 106]

RECOMMENDED ACTION: That the Board authorizes the participation in the Salt and Nutrient Plan for a sum not to exceed $23,654.

E. Consideration of Development Agreement No. 2021-01 for a Sewer Service at 32690 Yucaipa Boulevard, Yucaipa (Assessor Parcel Number 0299-321-84) [Director Memorandum No. 21-033 - Page 91 of 106]

RECOMMENDED ACTION: That the Board authorizes the Board President to execute Development Agreement No. 2021-01.

VII. BOARD REPORTS & DIRECTOR COMMENTS

VIII. ANNOUNCEMENTS

A. March 2, 2021 at 4:00 p.m. - Board Meeting - Teleconference Only
B. March 9, 2021 at 4:00 p.m. - Board Meeting - Teleconference Only
C. March 16, 2021 at 4:00 p.m. - Board Meeting - Teleconference Only
D. March 23, 2021 at 4:00 p.m. - Board Meeting - Teleconference Only
E. March 30, 2021 at 4:00 p.m. - Board Meeting - Teleconference Only
F. April 6, 2021 at 4:00 p.m. - Board Meeting - Teleconference Only
G. May 4, 2021 at 4:00 p.m. - Board Meeting - Teleconference Only

IX. ADJOURNMENT

EXECUTIVE ORDER N-29-20

WHEREAS on March 4, 2020, I proclaimed a State of Emergency to exist in California as a result of the threat of COVID-19; and

WHEREAS despite sustained efforts, the virus continues to spread and is impacting nearly all sectors of California; and

WHEREAS the threat of COVID-19 has resulted in serious and ongoing economic harms, in particular to some of the most vulnerable Californians; and

WHEREAS time bound eligibility redeterminations are required for Medi-Cal, CalFresh, CalWORKs, Cash Assistance Program for Immigrants, California Food Assistance Program, and In Home Supportive Services beneficiaries to continue their benefits, in accordance with processes established by the Department of Social Services, the Department of Health Care Services, and the Federal Government; and

WHEREAS social distancing recommendations or Orders as well as a statewide imperative for critical employees to focus on health needs may prevent Medi-Cal, CalFresh, CalWORKs, Cash Assistance Program for Immigrants, California Food Assistance Program, and In Home Supportive Services beneficiaries from obtaining in-person eligibility redeterminations; and

WHEREAS under the provisions of Government Code section 8571, I find that strict compliance with various statutes and regulations specified in this order would prevent, hinder, or delay appropriate actions to prevent and mitigate the effects of the COVID-19 pandemic.

NOW, THEREFORE, I, GAVIN NEWSOM, Governor of the State of California, in accordance with the authority vested in me by the State Constitution and statutes of the State of California, and in particular, Government Code sections 8567 and 8571, do hereby issue the following order to become effective immediately:

IT IS HEREBY ORDERED THAT:

1. As to individuals currently eligible for benefits under Medi-Cal, CalFresh, CalWORKs, the Cash Assistance Program for Immigrants, the California Food Assistance Program, or In Home Supportive Services benefits, and to the extent necessary to allow such individuals to maintain eligibility for such benefits, any state law, including but not limited to California Code of Regulations, Title 22, section 50189(a) and Welfare and Institutions Code sections 18940 and 11265, that would require redetermination of such benefits is suspended for a period of 90 days from the date of this Order. This Order shall be construed to be consistent with applicable federal laws, including but not limited to Code of Federal Regulations, Title 42, section 435.912, subdivision (e), as interpreted by the Centers for Medicare and Medicaid Services (in guidance issued on January 30, 2018) to permit the extension of

otherwise-applicable Medicaid time limits in emergency situations.

2. Through June 17, 2020, any month or partial month in which California Work Opportunity and Responsibility to Kids (CalWORKs) aid or services are received pursuant to Welfare and Institutions Code Section 11200 et seq. shall not be counted for purposes of the 48-month time limit set forth in Welfare an Institutions Code Section 11454. Any waiver of this time limit shall not be applied if it will exceed the federal time limits set forth in Code of Federal Regulations, Title 45, section 264.1.

3. Paragraph 11 of Executive Order N-25-20 (March 12, 2020) is withdrawn and superseded by the following text:

   Notwithstanding any other provision of state or local law (including, but not limited to, the Bagley-Keene Act or the Brown Act), and subject to the notice and accessibility requirements set forth below, a local legislative body or state body is authorized to hold public meetings via teleconferencing and to make public meetings accessible telephonically or otherwise electronically to all members of the public seeking to observe and to address the local legislative body or state body. All requirements in both the Bagley-Keene Act and the Brown Act expressly or impliedly requiring the physical presence of members, the clerk or other personnel of the body, or of the public as a condition of participation in or quorum for a public meeting are hereby waived.

   In particular, any otherwise-applicable requirements that

   (i) state and local bodies notice each teleconference location from which a member will be participating in a public meeting;

   (ii) each teleconference location be accessible to the public;

   (iii) members of the public may address the body at each teleconference conference location;

   (iv) state and local bodies post agendas at all teleconference locations;

   (v) at least one member of the state body be physically present at the location specified in the notice of the meeting; and

   (vi) during teleconference meetings, a least a quorum of the members of the local body participate from locations within the boundaries of the territory over which the local body exercises jurisdiction

   are hereby suspended.

   A local legislative body or state body that holds a meeting via teleconferencing and allows members of the public to observe and address the meeting telephonically or otherwise electronically, consistent with the notice and accessibility requirements set forth below, shall have satisfied any requirement that the body allow

members of the public to attend the meeting and offer public comment. Such a body need not make available any physical location from which members of the public may observe the meeting and offer public comment.

Accessibility Requirements: If a local legislative body or state body holds a meeting via teleconferencing and allows members of the public to observe and address the meeting telephonically or otherwise electronically, the body shall also:

(i) Implement a procedure for receiving and swiftly resolving requests for reasonable modification or accommodation from individuals with disabilities, consistent with the Americans with Disabilities Act and resolving any doubt whatsoever in favor of accessibility; and

(ii) Advertise that procedure each time notice is given of the means by which members of the public may observe the meeting and offer public comment, pursuant to subparagraph (ii) of the Notice Requirements below.

Notice Requirements: Except to the extent this Order expressly provides otherwise, each local legislative body and state body shall:

(i) Give advance notice of the time of, and post the agenda for, each public meeting according to the timeframes otherwise prescribed by the Bagley-Keene Act or the Brown Act, and using the means otherwise prescribed by the Bagley-Keene Act or the Brown Act, as applicable; and

(ii) In each instance in which notice of the time of the meeting is otherwise given or the agenda for the meeting is otherwise posted, also give notice of the means by which members of the public may observe the meeting and offer public comment. As to any instance in which there is a change in such means of public observation and comment, or any instance prior to the issuance of this Order in which the time of the meeting has been noticed or the agenda for the meeting has been posted without also including notice of such means, a body may satisfy this requirement by advertising such means using "the most rapid means of communication available at the time" within the meaning of Government Code, section 54954, subdivision (e); this shall include, but need not be limited to, posting such means on the body's Internet website.

All of the foregoing provisions concerning the conduct of public meetings shall apply only during the period in which state or local public health officials have imposed or recommended social distancing measures.

All state and local bodies are urged to use sound discretion and to make reasonable efforts to adhere as closely as reasonably possible to the provisions of the Bagley-Keene Act and the Brown Act, and other applicable local laws regulating the conduct of public meetings, in order to maximize transparency and provide the public access to their meetings.

IT IS FURTHER ORDERED that as soon as hereafter possible, this Order be filed in the Office of the Secretary of State and that widespread publicity and notice be given of this Order.

This Order is not intended to, and does not, create any rights or benefits, substantive or procedural, enforceable at law or in equity, against the State of California, its agencies, departments, entities, officers, employees, or any other person.

IN WITNESS WHEREOF I have hereunto set my hand and caused the Great Seal of the State of California to be affixed this 17th day of March 2020.

GAVIN NEWSOM
Governor of California

Consent Calendar

Yucaipa Valley Water District

MINUTES OF A BOARD MEETING - TELECONFERENCE

February 16, 2021 at 4:00 pm

Directors Present:
- Chris Mann, President
- Jay Bogh, Director
- Joyce McIntire, Director
- Dennis Miller, Director

Staff Present:
- Wade Allsup, Information Systems Specialist
- Madeline Blua, Water Resource Specialist
- Allison Edmisten, Chief Financial Officer
- Chelsie Fogus, Administrative Assistant I
- Ashley Gibson, Regulatory Compliance Manager
- Dustin Hochreiter, Senior Engineering Technician
- Mike Kostelecky, Operations Manager
- Tim Mackamul, Operations Manager
- Charles Thomas, Operations Manager
- John Wrobel, Operations Manager
- Joseph Zoba, General Manager

Directors Absent:
- Lonni Granlund, Vice President

Consulting Staff Present:
- David Wysocki, Legal Counsel

Registered Guests and Others Present:
- Logan Largent, Ortega Strategies Group
- Larry Smith, San Gorgonio Pass Water Agency

Due to the spread of COVID-19 and in accordance with the Governor's Executive Order N-29-20 (a copy of which was attached to the meeting agenda), the Yucaipa Valley Water District conducted this meeting by teleconference.

The meeting was available to the public by calling (888) 475-4499 using passcode 676-950-731 and live presentation material was available at https://zoom.us/j/676950731 using 765589.

CALL TO ORDER

The regular meeting of the Board of Directors of the Yucaipa Valley Water District was called to order by Chris Mann at 4:00 p.m.

ROLL CALL

The roll was called with Director Jay Bogh, Director Chris Mann, Director Joyce McIntire, and Director Dennis Miller present.

Director Lonni Granlund was absent.

PUBLIC COMMENTS

Director Larry Smith from the San Gorgonio Pass Water Agency complemented the presentation provided by Water Resource Manager Jennifer Ares at their Engineering Workshop on February 8, 2021.

CONSENT CALENDAR

Director Dennis Miller moved to approve the consent calendar and Director Jay Bogh seconded the motion.

A. Minutes of Meetings
   1. Board Meeting - February 9, 2021

The motion was approved by the following vote:
Director Jay Bogh - Yes
Director Lonni Granlund - Absent
Director Chris Mann - Yes
Director Joyce McIntire - Yes
Director Dennis Miller - Yes

STAFF REPORT

No report was provided.

DISCUSSION ITEMS:

DM 21-027

INSTALLATION OF AN ADDITIONAL CHEMICAL STORAGE TANK AT THE YUCAIPA VALLEY REGIONAL WATER FILTRATION FACILITY

Operations Manager Mike Kostelecky provided an overview of the costs for the installation of the additional chemical storage tank at the Yucaipa Valley Regional Water Filtration Facility.

Director Jay Bogh moved that the Board approve the installation of the secondary bulk chemical tank by Pascal & Ludwig for a sum not to exceed $62,450.

Director Dennis Miller seconded the motion.

The motion was approved by the following vote:
Director Jay Bogh - Yes
Director Lonni Granlund - Absent
Director Chris Mann - Yes
Director Joyce McIntire - Yes
Director Dennis Miller - Yes

DM 21-028

OVERVIEW OF SUGGESTED UPDATES TO THE 2019 YUCAIPA VALLEY WATER DISTRICT'S STANDARD DESIGN DRAWINGS AND SPECIFICATIONS

Senior Engineering Technician Dustin Hochreiter provided an overview of proposed updates to the District's standard design drawings. This item will be presented again at a future board meeting with all of the proposed changes for consideration by the Board of Directors.

BOARD REPORTS AND DIRECTOR COMMENTS	Director Joyce McIntire reported on the San Bernardino Valley Municipal Water District Policy Workshop held on February 11, 2021.
ANNOUNCEMENTS	Director Chris Mann called attention to the announcements listed on the agenda.
ADJOURNMENT	The meeting was adjourned at 4:10 p.m.

Respectfully submitted,

Joseph B. Zoba, Secretary (Seal)

Board Awarded Contracts
Consent Calendar Board Meeting - February 23, 2021

District Awarded Contracts	Director Memorandum	Job or GL #	Job Cost Breakdown	Awarded Contract Amount	Prior Payments to Date	Pending Invoice Amount	Total Contract Payments	Remaining Contract Amount	Percent Remaining
Law Office of David L. Wysocki - FY 2020-2021 Legal Services **(Operating)**	- -	*-5-06-54107	- -	- -	$19,727	$3,375	$23,102		
DDB Engineering **(R-Reserves)**	15-086	04-19771	- -	$35,900	$25,395	$0	$25,395	$10,505	29%
Application to DDW for the Recharge at Wilson Creek Basins									
Delta Partners $90,000 per year-Legislative Consult (exp 12/18) **W\S Oper**	13-079	*-5-06-54109	$90,000	$360,000	$240,000	$7,500	$247,500	$112,500	31%
Three Year Contract Extension (exp 12/2021)	19-052	*5-06-54109	$270,000						
Dudek **(S-Operating)**	20-038								
2020-Max Benefit Monitoring for San Timoteo/Yucaipa Mgmt. Zones		03-5-06-54109	- -	$52,338	$18,207	$1,123	$19,330	$33,009	63%
Dudek **(S-Operating)**	20-037	65-15339							
2020-Habitat Monitoring Program (HMP) in San Timoteo Creek		03-5-06-57030	- -	$52,660	$26,074	$3,133	$29,207	$23,454	45%
ECORP **(W/S Reserves)**	02-5-06-54109								
Prepare Study/Mitigated Negative Declaration/Oak Valley Recharge	18-157	77-32719	$47,520	$52,020	$25,974	$0	$25,974	$26,046	50%
DM 19-039 Ratification of original contract-addt'l sum not to exceed $4500.00	19-093		$4,500						
ECORP **(W/S Reserves)**	03-502-51003								
YVWD-Salinity and Groundwater Enhancement (Sage) Project W/S Reserves	19-022	88-23792		$9,645	$266	$0	$266	$9,379	97%
Geoscience									
Pilot Recharge Testing of the Beaumont Basin **(S-Reserves) $**326,956	18-140	03-5-06-54109	- -	$974,251	$818,925	$0	$818,925	$155,326	16%
Amendment #1 -DM 19-057 - $101,464	19-057								
Amendment #2 -DM 19-097 - $456,064	19-097								
Amendment #3 -DM 19-125 - $89,767	19-125								
Geoscience									
Tracer Study Analysis at Wilson Creek Spreading Basins ($34,560.00)	19-024	02-5-06-54109	- -	$42,490	$36,222	$0	$36,222	$6,268	15%
DM 20-008 Budget Amendment for the Tracer Study ($7,930.00)_	20-008								
Inland Potable Services									
Reservoir Cleaning and Inspection Services/expires 2021(Water & Recycled)	18-158	*5-01-51003	- -	$175,593	$157,126	$0	$157,126	$18,467	11%
2019- (15)Reservoirs-43,537.00- DM 19-038 Change Order to Increase 35,900.00	19-038								
2020- (16)Reservoirs 54,540.00									
2021- (17)Reservoirs-41,616.00									
One Stop Landscape Supply FY 20-21 Sludge Hauling\Reuse (**Oper)**	- -	03-5-02-57031	- -	- -	$151,406	$25,265	$176,671		
RMC Water & Environment/**Woodard & Curran**									
TO#26, SRF Mgmt. Svcs-Calimesa Regional Recycled Pipeline **(R-FCC)**	14-023	04-5-06-54109		$95,692	$69,361	$0	$69,361	$26,331	28%
Separation Processes, Inc. **(W-Reserves)**		55-19200							
Design & Construction Supports Servs for NF SCRAM	15-047	02-14500		$191,820	$170,980	$0	$170,980	$20,840	11%
Application to DDW for the Recharge at Wilson Creek Basins **(R-Resrvs)**	15-086	04-19771	- -	$42,860	$24,527	$0	$24,527	$18,333	43%
Feasibility Report for Wochholz SAGE Project ($67,575.00)	17-043	03-5-06-54109		$99,835	$98,311	$0	$98,311	$1,524	2%

Board Awarded Contracts
Consent Calendar Board Meeting - February 23, 2021

District Awarded Contracts	Director Memorandum	Job or GL #	Job Cost Breakdown	Awarded Contract Amount	Prior Payments to Date	Pending Invoice Amount	Total Contract Payments	Remaining Contract Amount	Percent Remaining
Preliminary Engineering Design Study-SAGE Project ($32,260.00)	19-106	03-5-06-54109							
WWTP Monitoring Operations & Reporting Enhancement (MORE) **(S-Oper)**	18-122	03-5-06-54109		$330,436	$265,048	$13,005	$278,053	$52,384	16%
WWTP -RCA - Foaming- Improve energy efficiency and treatment process	19-025	03-5-06-54109		$36,800	$34,621	$0	$34,621	$2,179	6%
WWTP -Secondary Treatment Process Improvement	20-073	03-5-06-54109		$158,753	$100,802	$5,233	$106,035	$52,718	33%
WWTP - Reverse Osmosis Pilot Study	20-099	03-5-06-54109		$192,860	$13,182	$2,571	$15,753	$177,107	92%
WWTP- Autostrainer Replacement (Sewer Reserves) Pascal Ludwig-$229,111.00 Forstra Filters -$152,208.00 Q-Versa- $28,800.00	20-132	03-13002		$487,000	$166,137	$243,762	$409,899	$77,101	
GRAND TOTALS				**$2,903,953**	**$2,296,154**	**$304,965**	**$2,601,119**	**$823,470**	- -

Check Register - January 2021

Date	Check #	Payee or Description		Amount
01/11/2021	38294	Atkinson, Andelson, Loya, Ruud & Romo	$	65.00
01/11/2021	38295	Risk Sciences	$	2,333.33
01/11/2021	38296	ADS, LLC	$	6,210.00
01/11/2021	38297	Alpine Springs	$	114.95
01/11/2021	38298	Ameripride Uniform Services	$	853.18
01/11/2021	38299	AT&T Mobility	$	1,960.22
01/11/2021	38300	Augusta Fiberglass Coatings, Inc	$	11,550.00
01/11/2021	38301	AutoZone Stores LLC	$	26.94
01/11/2021	38302	Backflow Prevention Device Inspections,	$	115.43
01/11/2021	38303	Bay Alarm Company	$	5,643.80
01/11/2021	38304	Best Home Center	$	19.37
01/11/2021	38305	BofA Credit Card	$	9,370.63
01/11/2021	38306	Borden Excavating, Inc.	$	31,659.68
01/11/2021	38307	Brenntag Pacific, Inc	$	16,228.72
01/11/2021	38308	BSK Associates	$	1,360.00
01/11/2021	38309	CA-EPA Dept Of Toxic Substances/DTSC	$	300.00
01/11/2021	38310	California Department of Fish and Wildli	$	7,172.50
01/11/2021	38311	California Water Environment Association	$	192.00
01/11/2021	38312	Caselle, Inc.	$	2,870.00
01/11/2021	38313	Clinical Laboratory of San Bernardino	$	9,987.00
01/11/2021	38314	Coverall North America, Inc.	$	1,331.00
01/11/2021	38315	Craig Chin	$	7,218.29
01/11/2021	38316	Doan and Hartwig Water Systems, Inc.	$	6,899.90
01/11/2021	38317	Donald Tellyer	$	40.98
01/11/2021	38318	Epic Pest Management	$	170.00
01/11/2021	38319	Evoqua Water Technologies LLC	$	303.05
01/11/2021	38320	Fedex	$	147.06
01/11/2021	38321	First American Data Tree, LLC	$	50.00
01/11/2021	38322	Freedom Mailing Services	$	7,864.35
01/11/2021	38323	Frontier Communications	$	216.80
01/11/2021	38324	G&G Environmental Compliance,Inc	$	3,887.50
01/11/2021	38325	Gerold Construction Inc.	$	2,890.00
01/11/2021	38326	GLS US	$	95.91
01/11/2021	38327	Grainger	$	209.69
01/11/2021	38328	Hasa, Inc.	$	7,560.16
01/11/2021	38329	JW D'Angelo Co.	$	18,056.03
01/11/2021	38330	Krieger & Stewart	$	95,057.30
01/11/2021	38331	Les Schwab Tire Center	$	72.80
01/11/2021	38332	Merit Oil Company	$	5,123.14
01/11/2021	38333	NCL Of Wisconsin Inc	$	112.60
01/11/2021	38334	NetComp Technologies,Inc.	$	150.00
01/11/2021	38335	Nexa	$	695.00
01/11/2021	38336	Pacific Coast Landscape & Design, Inc.	$	5,475.00
01/11/2021	38337	Pride Plumbing Services	$	329.63
01/11/2021	38338	Pro-Pipe & Supply, Inc.	$	144.03
01/11/2021	38339	Q Versa, LLC	$	8,476.63

Check Register - January 2021

Date	Check #	Payee or Description		Amount
01/11/2021	38340	Quadient Leasing USA, Inc	$	353.07
01/11/2021	38341	Redline	$	19,572.86
01/11/2021	38342	Russell Anderson	$	74.97
01/11/2021	38343	San Bdno. Valley Muni. Water Dist.	$	-
01/11/2021	38344	San Bernardino County Dept of Public Wor	$	32,173.00
01/11/2021	38345	San Gorgonio Pass Water Agency	$	12,281.22
01/11/2021	38346	SCCI, Inc.	$	350.00
01/11/2021	38347	SCE Rosemead	$	188,109.45
01/11/2021	38348	Separation Processes, Inc.	$	5,988.75
01/11/2021	38349	South Coast A.Q.M.D.	$	557.42
01/11/2021	38350	Spectrum Business	$	2,649.00
01/11/2021	38351	State Water Resources Control Board	$	40,999.20
01/11/2021	38352	The Counseling Team International	$	600.00
01/11/2021	38353	The Gas Company	$	4,151.92
01/11/2021	38354	Time Warner Cable	$	-
01/11/2021	38355	TPX Communications	$	1,962.46
01/11/2021	38356	Underground Service Alert Of So. CA	$	278.95
01/11/2021	38357	United Rentals Inc.	$	471.65
01/11/2021	38358	US Bank	$	9,639.92
01/11/2021	38359	USA BlueBook	$	1,147.38
01/11/2021	38360	USDA Forest Service	$	131.88
01/11/2021	38361	Xylem Dewatering Solutions, Inc	$	2,392.64
01/11/2021	38362	Yucaipa Disposal, Inc.	$	1,998.86
01/11/2021	38363	Yucaipa Valley Water District	$	67,852.65
01/11/2021	38364	Berkshire Hathaway Homestate Companies	$	20,661.42
01/11/2021	38365	San Bdno. Valley Muni. Water Dist.	$	9,618.82
01/11/2021	38366	San Bdno. Valley Muni. Water Dist.	$	801,975.00
01/11/2021	38367	Time Warner Cable	$	1,834.00
01/11/2021	38368	Time Warner Cable	$	5,995.11
01/11/2021	38369	Texas Pride Trailers	$	12,772.59
01/19/2021	38370	David L. Wysocki	$	3,262.50
01/19/2021	38371	Delta Partners, LLC	$	7,500.00
01/19/2021	38372	Dudek & Associates, Inc	$	1,030.00
01/19/2021	38373	Geoscience Support Services, Inc.	$	9,368.50
01/19/2021	38374	One Stop Landscape Supply Inc	$	28,638.50
01/15/2021	38375	California State Disbursement Unit	$	628.14
01/15/2021	38376	WageWorks Inc	$	1,668.47
01/19/2021	38377	Aflac	$	2,861.60
01/19/2021	38378	Blue Shield of California	$	4,275.20
01/19/2021	38379	Nippon Life Insurance Co	$	2,872.43
01/19/2021	38380	Standard Dental Insurance Co	$	1,369.00
01/19/2021	38381	Standard Insurance Vision Plan	$	302.08
01/19/2021	38382	Western Dental Services Inc	$	241.04
01/19/2021	38383	Alpine Springs	$	92.45
01/19/2021	38384	Ameripride Uniform Services	$	830.16
01/19/2021	38385	AT&T Mobility	$	1,962.80

Check Register - January 2021

Date	Check #	Payee or Description		Amount
01/19/2021	38386	Auto Care Clinic	$	672.07
01/19/2021	38387	Best Home Center	$	87.93
01/19/2021	38388	BofA Credit Card	$	866.67
01/19/2021	38389	Brax Company, Inc	$	9,613.31
01/19/2021	38390	Brenntag Pacific, Inc	$	43,537.39
01/19/2021	38391	BSK Associates	$	1,005.00
01/19/2021	38392	Burgeson's Heating & Air Cond. Inc	$	735.00
01/19/2021	38393	California Water Environment Association	$	384.00
01/19/2021	38394	Center Electric Services, Inc.	$	7,545.62
01/19/2021	38395	Clark Pest Control	$	115.00
01/19/2021	38396	Corelogic, Inc.	$	330.00
01/19/2021	38397	Crown Ace Hardware - Yucaipa	$	164.23
01/19/2021	38398	Dan Nenstiel	$	255.69
01/19/2021	38399	Doug's Filter Service, Inc.	$	1,266.92
01/19/2021	38400	Empire Fire Equipment	$	2,272.50
01/19/2021	38401	Evoqua Water Technologies LLC	$	2,271.15
01/19/2021	38402	GLS US	$	30.48
01/19/2021	38403	Hasa, Inc.	$	4,118.34
01/19/2021	38404	Humboldt Mfg. Co.	$	930.00
01/19/2021	38405	J.L. Wingert Co.	$	6,018.62
01/19/2021	38406	JW D'Angelo Co.	$	3,628.01
01/19/2021	38407	Konica Minolta Business Solutions	$	424.68
01/19/2021	38408	Leach Microbial Consulting, LLC	$	2,350.00
01/19/2021	38409	Merit Oil Company	$	2,007.84
01/20/2021	38410	NAPA Genuine Parts Company	$	-
01/19/2021	38411	O'Conner Equipment	$	595.00
01/19/2021	38412	Pro-Pipe & Supply, Inc.	$	38.80
01/19/2021	38413	Ron Vanvoorthuysen	$	26.60
01/19/2021	38414	Schaner's WasteWater Prod., Inc	$	5,104.00
01/19/2021	38415	Spectrum Business	$	1,834.00
01/19/2021	38416	T.T. Technologies, Inc.	$	117.86
01/19/2021	38417	Tramfloc, Inc	$	1,902.00
01/19/2021	38418	Superior Automotive Warehouse, Inc	$	431.39
01/25/2021	38419	Alejandro Quiroga	$	83.47
01/25/2021	38420	Alexander's Meter Reading Solutions	$	793.00
01/25/2021	38421	Ameripride Uniform Services	$	820.09
01/25/2021	38422	Aquafix, Inc	$	11,268.56
01/25/2021	38423	Barnes & Thornburg LLP	$	5,000.00
01/25/2021	38424	Bay Alarm Company	$	38.36
01/25/2021	38425	Best Home Center	$	170.66
01/25/2021	38426	Brenntag Pacific, Inc	$	16,876.92
01/25/2021	38427	BSK Associates	$	2,090.00
01/25/2021	38428	Contron Scada Systems	$	4,453.06
01/25/2021	38429	Crown Ace Hardware - Yucaipa	$	92.01
01/25/2021	38430	Earnest Mancilla	$	73.53
01/25/2021	38431	Frontier Communications	$	46.25

Check Register - January 2021

Date	Check #	Payee or Description		Amount
01/25/2021	38432	GEI Consultants, Inc.	$	3,418.00
01/25/2021	38433	GLS US	$	28.31
01/25/2021	38434	Grainger	$	1,001.59
01/25/2021	38435	Home Depot U.S.A. Inc	$	585.54
01/25/2021	38436	Inland Water Works Supply Co.	$	564.83
01/25/2021	38437	Integrity Hose and Fittings	$	576.21
01/25/2021	38438	Joseph Ruiz	$	424.82
01/25/2021	38439	JW D'Angelo Co.	$	9,345.48
01/25/2021	38440	Matthew M. Barlow	$	7,070.00
01/25/2021	38441	Merit Oil Company	$	4,000.14
01/25/2021	38442	Moxtra, Inc	$	25,380.00
01/25/2021	38443	Nalco Company	$	11,311.72
01/25/2021	38444	NetComp Technologies,Inc.	$	3,315.13
01/25/2021	38445	Pro-Pipe & Supply, Inc.	$	120.55
01/25/2021	38446	Quadient Leasing USA, Inc	$	172.40
01/25/2021	38447	Safeguard Business Systems Inc	$	63.19
01/25/2021	38448	San Bdno. Valley Muni. Water Dist.	$	32,445.26
01/25/2021	38449	SB CNTY-Solid Waste Mgmt Div	$	29.11
01/25/2021	38450	SCE Rosemead	$	225,355.44
01/25/2021	38451	Southern CA Emergency Medicine, Inc.	$	150.00
01/25/2021	38452	Spectrum Business	$	2,649.00
01/25/2021	38453	Sulzer Elector-Mechanical Services Inc.	$	2,539.37
01/25/2021	38454	Superior Automotive Warehouse, Inc	$	512.83
01/25/2021	38455	Tom Robinette	$	12.10
01/25/2021	38456	UPS Store#1504/ Mail Boxes Etc.	$	88.29
01/25/2021	38457	US Bank	$	9,251.73
01/25/2021	38458	USA BlueBook	$	168.10
01/25/2021	38460	Atkinson, Andelson, Loya, Ruud & Romo	$	65.00
01/25/2021	38461	Meyers | Nave	$	45,494.18
01/29/2021	38462	California State Disbursement Unit	$	628.14
01/29/2021	38463	WageWorks Inc	$	1,668.47
01/29/2021	38464	Doug Earnest	$	685.14
01/29/2021	38465	Joe DeSalliers	$	603.35
01/29/2021	38466	Peggy Little	$	685.14
01/29/2021	38467	Robert Wall	$	799.13
			$	**2,127,800.36**
01/15/2021	electronic pmt	DIRECT DEPOSIT TOTAL	$	182,502.94
01/15/2021	electronic pmt	CalPERS 457 & Loan	$	28,753.77
01/15/2021	electronic pmt	CalPERS Retirement	$	33,713.75
01/15/2021	electronic pmt	EDD - State of California	$	10,978.08
01/15/2021	electronic pmt	IRS	$	68,697.41
01/15/2021	electronic pmt	VOYA 457 Retirement Plan	$	4,378.53
01/19/2021	electronic pmt	CalPERS Health Insurance	$	97,037.30
01/29/2021	electronic pmt	CalPERS 457 & Loan	$	27,449.94

Check Register - January 2021

Date	Check #	Payee or Description	Amount
01/29/2021	electronic pmt	CalPERS Retirement	$ 33,777.44
01/29/2021	electronic pmt	EDD - State of California	$ 10,787.73
01/29/2021	electronic pmt	IRS	$ 61,648.88
01/29/2021	electronic pmt	VOYA 457 Retirement Plan	$ 4,498.17
01/29/2021	electronic pmt	DIRECT DEPOSIT TOTAL	$ 151,729.99
01/29/2021	electronic pmt	HUTCHINSON, DANIEL G	$ 692.62
			$ 716,646.55

Staff Report

Yucaipa Valley Water District

Discussion Items

Yucaipa Valley Water District

Yucaipa Valley Water District

Director Memorandum 21-029

Date: February 23, 2021

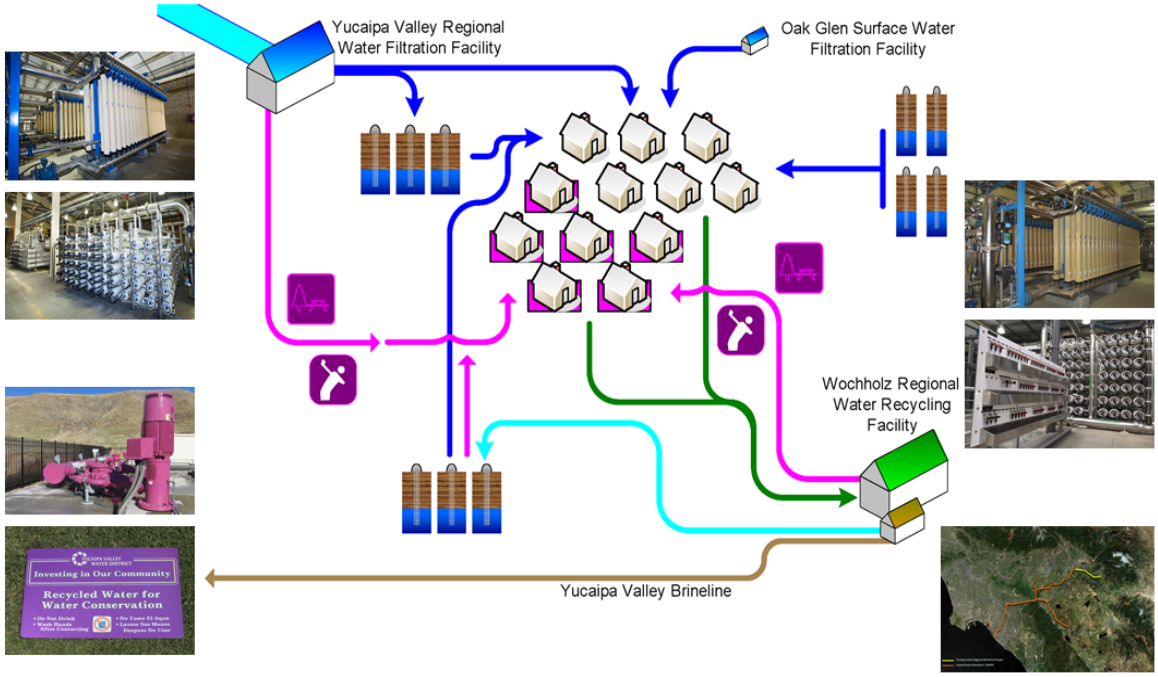
Prepared By: Joseph B. Zoba, General Manager

Subject: Adoption of the 2021 Strategic Priorities, Goals and Objectives

Recommendation: That the Board, by minute order, adopt the 2021 strategic planning priorities.

Over the past several decades, the Yucaipa Valley Water District has embarked on a series of capital improvement projects that have created integrated systems of drinking water, recycled water, sewer treatment, and brine disposal facilities. The integration of these facilities has set the Yucaipa Valley Water District on a path to provide exceptionally pure water resources for our community into the future.

Sustainable and Integrated Infrastructure Concepts



Each year the Board of Directors uses the strategic planning process to set priorities for capital improvement projects and related programs that result in additional supplies of high quality water for our community. The following document establishes the strategic planning priorities for this year.

Yucaipa Valley Water District

2021 Strategic Priorities, Goals, and Objectives

Adopted on February 23, 2021.

On August 28, 2009, the Board of Directors of the Yucaipa Valley Water District adopted A Strategic Plan for a Sustainable Future - The Integration and Preservation of Resources. The development of this document was made possible by the contribution of ideas and concepts by the Board of Directors, District staff, members of the public, and various stakeholders. The constructive suggestions and diverse perspectives allowed us as a community to begin our journey towards a sustainable future.

In summary, the steps taken by the District to protect and conserve our natural resources are based on the concepts that:

- Resources are not limitless and therefore need to be conserved, nurtured, and renewed; and

- Resources that are used to generate short-term gains result in an inefficient and inequitable consumption of resources that are not beneficial for a long-term strategy.

By embracing these foundational concepts, the District has been able to routinely make decisions that are conservative, thoughtful, and conscious of the role we play today to achieve the established goals of our long-term strategy.

The management of our water resources is extremely complex and multi-faceted. It is foolish the assume that a single solution exists to solve complex water resource management issues into the future. Instead, we must take small steps on paths that are not frequently traveled towards the desired outcome.

By constantly reviewing the strategic priorities of the District, we are able to make tremendous strides and progress towards a reliable and sustainable future for the community we serve. Therefore, this annual review of our strategic priorities represents the small steps that will lead to amazing achievements.

Yucaipa Valley Water District

2021 Strategic Priorities, Goals and Objectives

- **Monitoring Operations and Reporting Enhancements (MORE) Project** - In 2018, the Board of Directors authorized the initiation of the Monitoring Operations and Reporting Enhancement (MORE) Project. This project monitors and records the operational status of the advanced treated water produced from the Wochholz Regional Water Recycling Facility. The primary elements of the MORE project include:
    - The monitoring and removal of Contaminants of Emerging Concerns (CEC).
    - The publication of reverse osmosis chemical removal test results.
    - The continuous operation of microfiltration and reverse osmosis processes at the Wochholz Regional Water Recycling Facility to achieve drinking water compliance standards.
    - The initiation of additional microfiltration and reverse osmosis virus removal studies; and
    - The demonstration of reverse osmosis reliability through automated conductivity profiling.

- **Development of a Communication Portal for Dual Plumbed Customers** - The District's dual-plumbed service program requires a significant amount individual contact with customers to make sure the irrigation systems are well documented and operated. In 2021, the District staff will be implementing and activating an online portal that will facilitate communication and documentation between the District staff and our dual-plumbed customers.

- **Indirect Potable Reuse** - Plan and evaluate the opportunities and constraints related to implementation of indirect potable reuse to produce additional drinking water supplies in the future. This strategic goal will involve the recharge of recycled water at the Wilson Creek Spreading Basins.

- **Calimesa Aquifer Storage and Recovery (ASR) Facilities** - The Calimesa Aquifer Storage and Recovery Program will utilize the local groundwater basin for the additional storage and extraction of both recycled water and drinking water. This project will involve the construction of a lake and groundwater injection facilities in the Beaumont Basin to maximize the operational efficiency of groundwater resources within the Calimesa portion of the District's service area.

- **Public Relations and Outreach** - Plan and implement a program to gain and enhance the District's presence involving social media, creation of video clips about the District's operations, historical information, and regular press releases to inform the public about District projects.

- **Energy Efficiency Improvements** - Plan and evaluate opportunities and constraints related to implementation of solar, microturbines, biogas, and other technologies to stabilize future energy expenses. This strategic goal will involve the investigation of innovative technologies and programs to become more energy efficient.

- **Septic Tank Elimination Program** - The implementation of a Septic Tank Elimination Program will provide a mechanism for customers to eliminate their septic system to protect groundwater quality for the future. This strategic planning element will involve the installation of sewer infrastructure in areas that are currently served by septic system.

- **Advanced Metering Infrastructure** - The District staff will continue to complete the installation of Advanced Metering Infrastructure (AMI) throughout the District. This system will be expanded this year to include pressure monitoring throughout the distribution system.

Yucaipa Valley Water District

Director Memorandum 21-030

Date: February 23, 2021

Prepared By: Joseph B. Zoba, General Manager

Subject: Discussion Regarding the Preparation of a Request for Proposals to Provide Financial Advisory Services

Recommendation: That the Board, by minute order, directs the General Manager to prepare a Request for Proposals for Financial Advisory Services for funding sewer and recycled water Capital Improvement Projects.

The District typically uses a pay-as-you-go funding for most routine capital improvement projects. These projects require sufficient funds in reserve in order to proceed with the projects. Other large scale, multi-generational projects utilize debt financing to fairly spread the capital cost of the project to future customers.

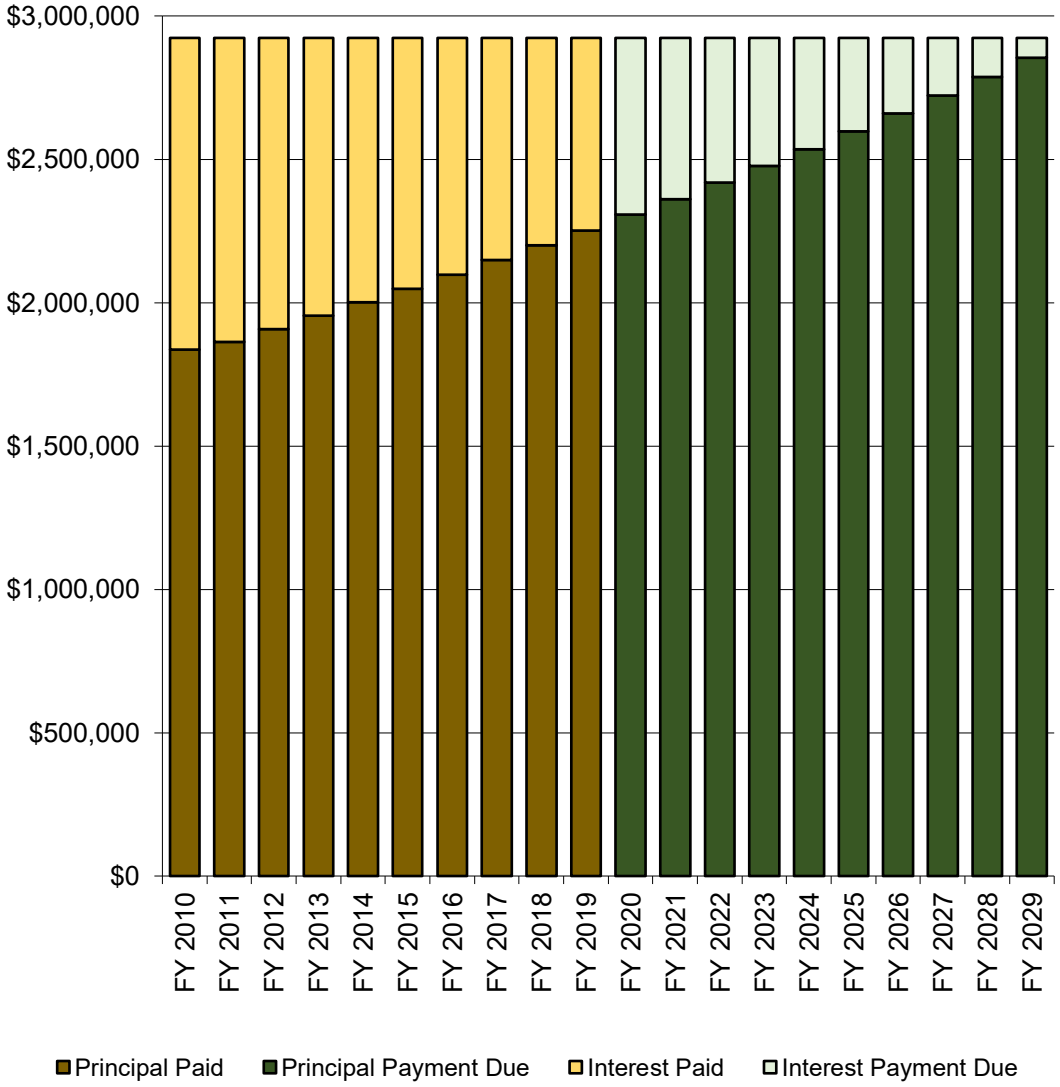
Yucaipa Valley Water District - Existing Debt

Due Date	Fund	Description	Balance as of 2/1/2021	Interest Rate	Term of Obligation	Amount
09/01/2020	Water	2015A Bond Payment - YVRWFF	$ 24,220,000.00	3%-5%	2015-2034	$ 2,292,612.50
09/10/2020	Sewer	SRF Payment - WRWRF	$ 21,052,776.66	2.40%	2009-2028	$ 2,923,668.75
12/31/2020	Sewer	SRF Payment - Yucaipa Regional Brineline	$ 6,580,155.83	2.70%	2013-2032	$ 649,273.50
03/31/2021	Sewer	SRF Payment - Recycled Reservoir R-10.3	$ 607,916.79	2.20%	2014-2033	$ 54,277.31
03/31/2021	Sewer	SRF Payment - Desalinization at WRWRF	$ 2,074,851.64	2.20%	2014-2033	$ 185,251.30
03/31/2021	Sewer	SRF Payment - Crow Street/Recycled Booster B-12.1	$ 237,704.80	2.20%	2016-2035	$ 21,223.27
			$ 54,773,405.72			**$ 6,126,306.63**

During this agenda item, the District staff will be discussing the use of a financial advisor to consolidate the existing sewer enterprise debt and to provide funding for the following capital improvement projects:

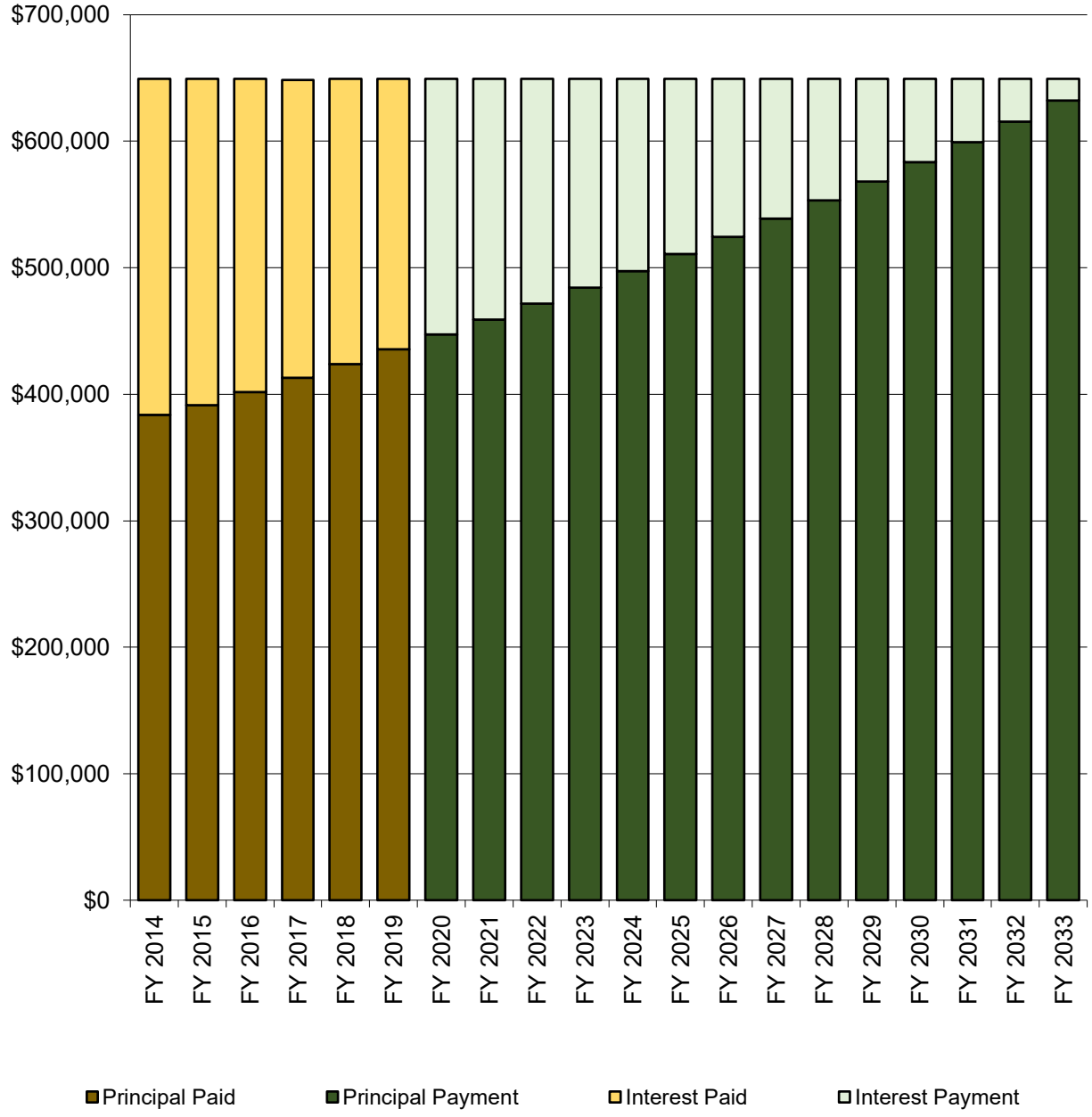
- Aquifer Storage and Recovery Project - Yucaipa and Calimesa
- Salinity and Groundwater Enhancement (SAGE) Project
- Calimesa Regional Recycled Water Pipeline Project
- Sewer Mainline Improvements to the Wochholz Regional Water Recycling Facility
- Natural Gas Pipeline for Power Resiliency Project

Wochholz Regional Water Recycling Facility Expansion - The Yucaipa Valley Water District has secured a $44,748,356 low interest loan (2.4% interest rate) for the expansion and upgrade of the Wochholz Regional Water Recycling Facility. The District received full disbursement of the loan fund in fiscal year 2009 and annual repayment of $2,923,669 started in fiscal year 2010 based on the following schedule:



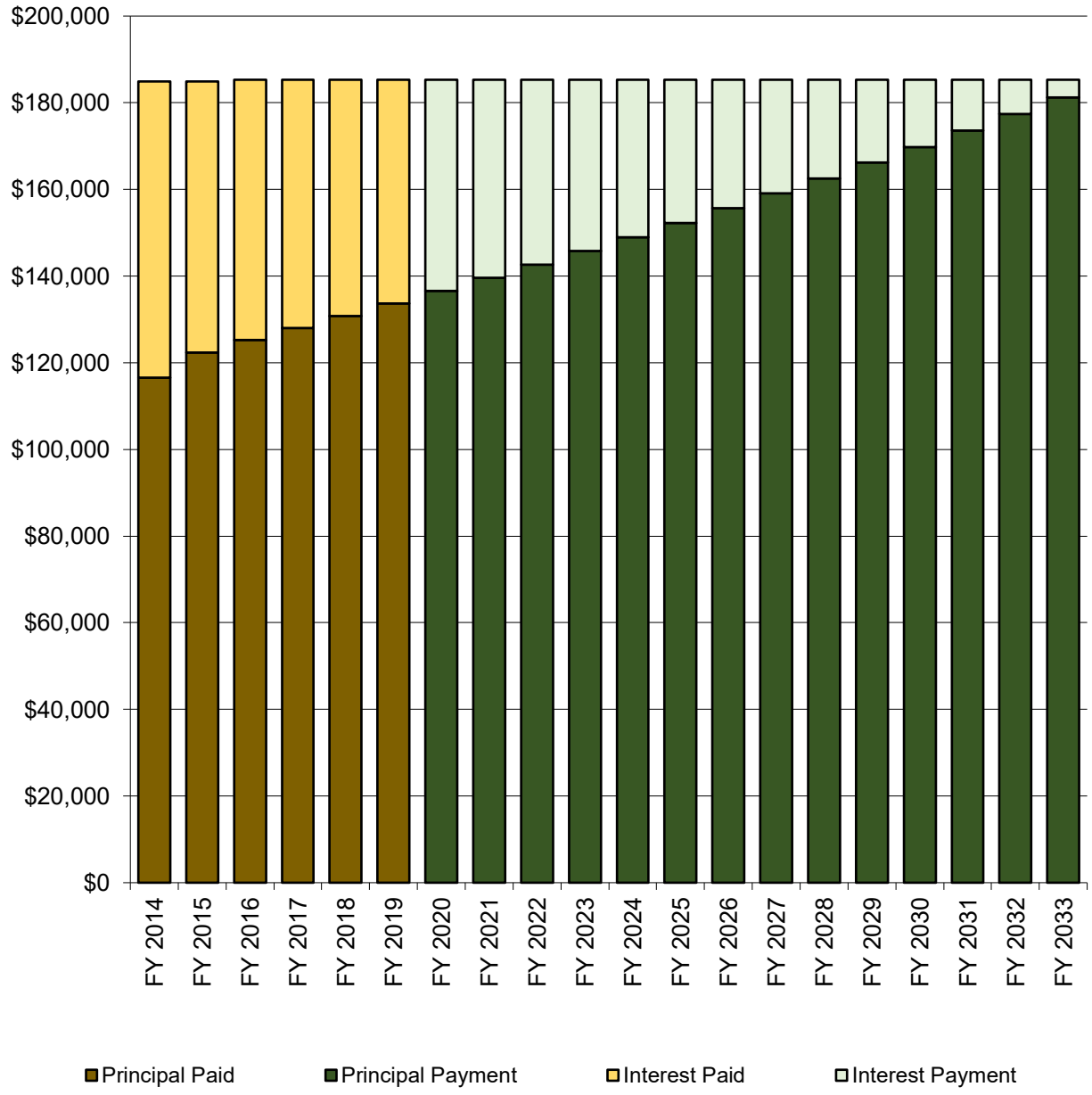
The annual loan payments are due on September 10th. The loan extends until September 10, 2028.

Yucaipa Valley Regional Brineline – The Yucaipa Valley Water District has secured a $9,752,100 low interest loan (2.7% interest rate) for the construction of the Yucaipa Valley Regional Brineline. The construction cost for this facility was $19,706,156 which was also funded by several grants and cash. The District received full disbursement of the loan fund in fiscal year 2013 and annual repayment of $649,274 started in fiscal year 2014 based on the following schedule:



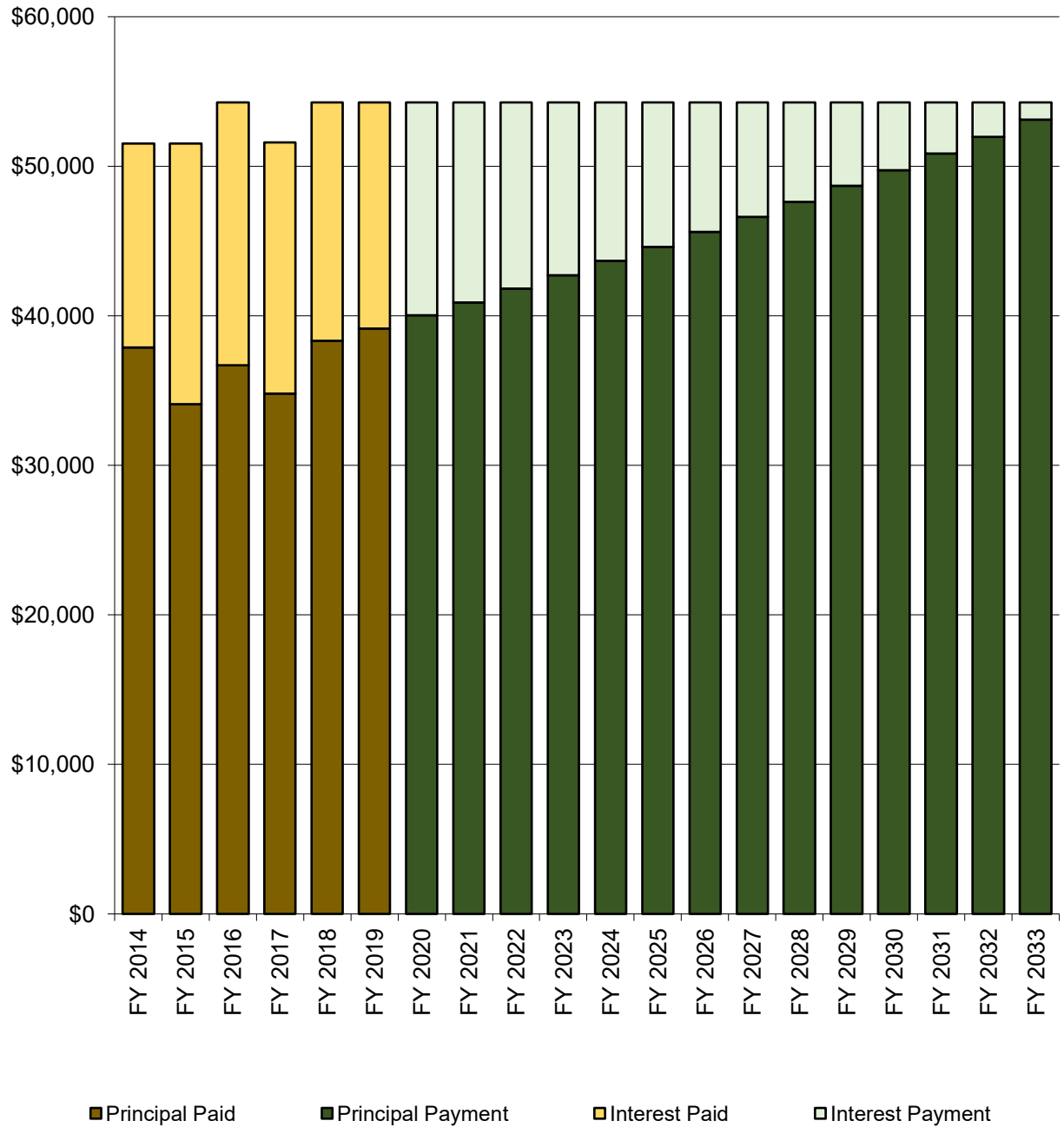
The annual loan payments are due on December 31st. The loan extends until December 31, 2032.

Wochholz Improved Salinity Effluent Project (W.I.S.E.) – The Yucaipa Valley Water District has secured a $2,988,095 low interest loan (2.2% interest rate) for the construction of the reverse osmosis equipment at the Wochholz Regional Water Recycling Facility to achieve compliance with the Regional Water Quality Control Board Basin Plan objectives. The construction cost for this facility was $5,003,170 which was also funded by grants and cash. The District received full disbursement of the loan fund in fiscal year 2015 and annual repayment of $185,251 started in fiscal year 2014 based on the following schedule:



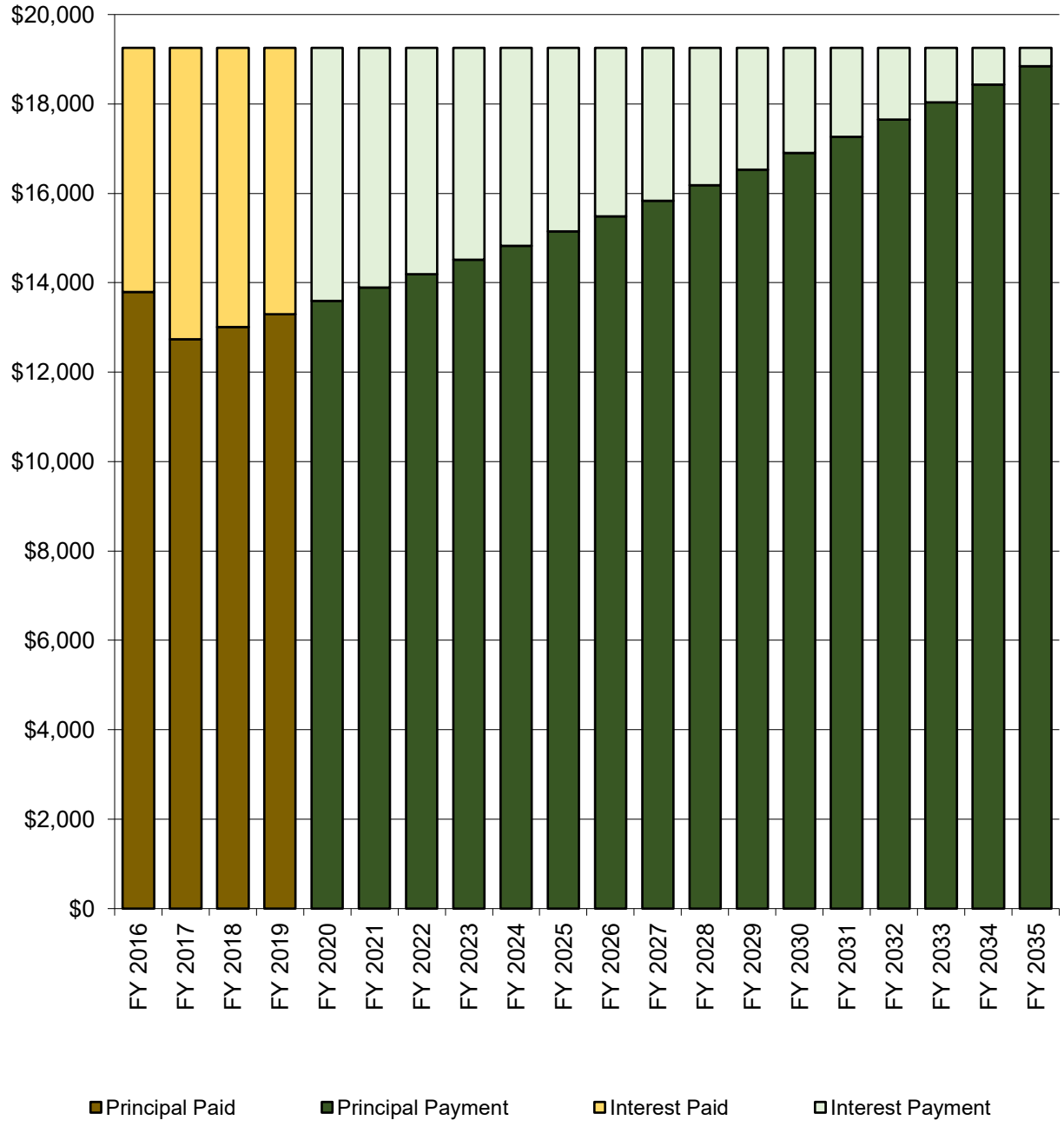
The annual loan payments are due on March 31st. The loan extends until March 31, 2033.

Recycled Water Reservoir R-10.3 – The Yucaipa Valley Water District has secured a $871,570 low interest loan (2.2% interest rate) for the construction of the Recycled Water Reservoir Complex R-10.3. The construction cost for this facility was $4,177,087 which was also funded by grants and cash. The District received full disbursement of the loan fund in fiscal year 2014 and annual repayment of $54,277 started in fiscal year 2014 based on the following schedule:



The annual loan payments are due on March 31st. The loan extends until March 31, 2033.

Crow Street Recycled Water Pipeline and Booster B-12.1 – The Yucaipa Valley Water District has secured a $310,179 low interest loan (2.2% interest rate) for the construction of the Crow Street Recycled Water Pipeline and Recycled Water Booster Station B-12.1. The construction cost for this facility was $2,972,167 which was also funded by grants and cash. The District received full disbursement of the loan fund in fiscal year 2015 and annual repayment of $19,254 started in fiscal year 2016 based on the following schedule:



The annual loan payments are due on March 31st. The loan extends until March 31, 2035.

Yucaipa Valley Water District

Director Memorandum 21-031

Date: February 23, 2021

Prepared By: Joseph B. Zoba, General Manager

Subject: Consideration of Injection Well Design, Construction Management, and Inspection Services from Geoscience Support Services

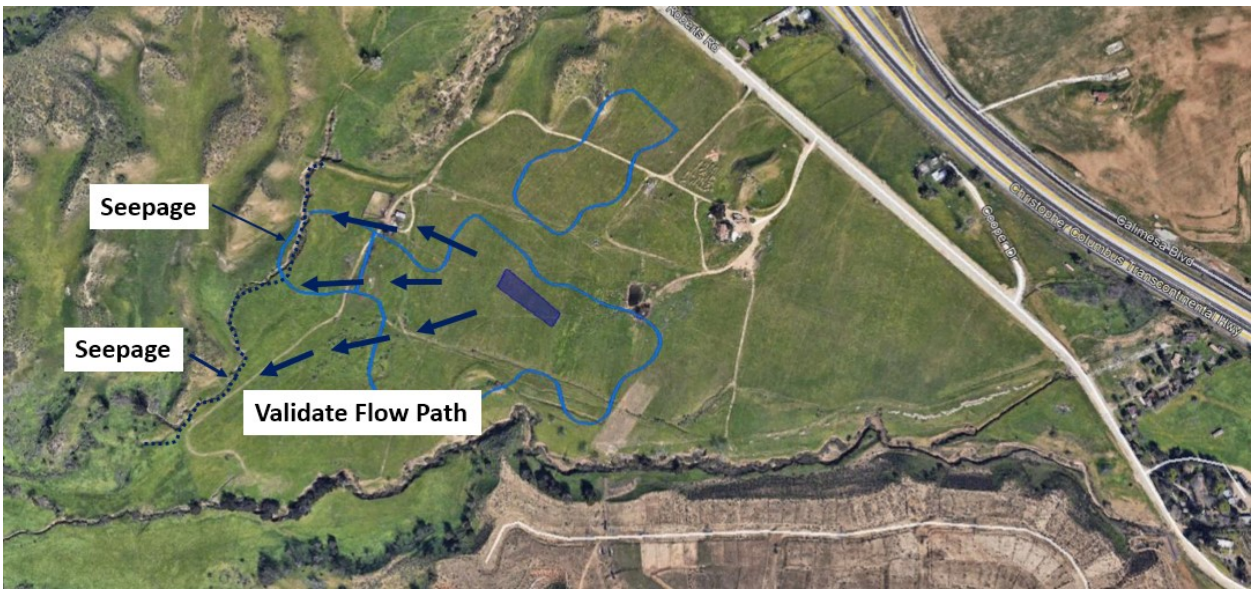
Recommendation: That the Board (1) authorizes the General Manager to issue a Notice to Proceed with Geoscience to perform professional hydrogeological services for the design, construction management, and inspection services for injection and monitoring wells for the Aquifer Storage and Recovery Project for a sum not to exceed $450,818, and (2) adopt Resolution No. 2021-11.

On November 6, 2018, the Board of Directors authorized the General Manager to execute a contract with Geoscience to investigate the long-term infiltration rates in the western portion of the Beaumont Basin.

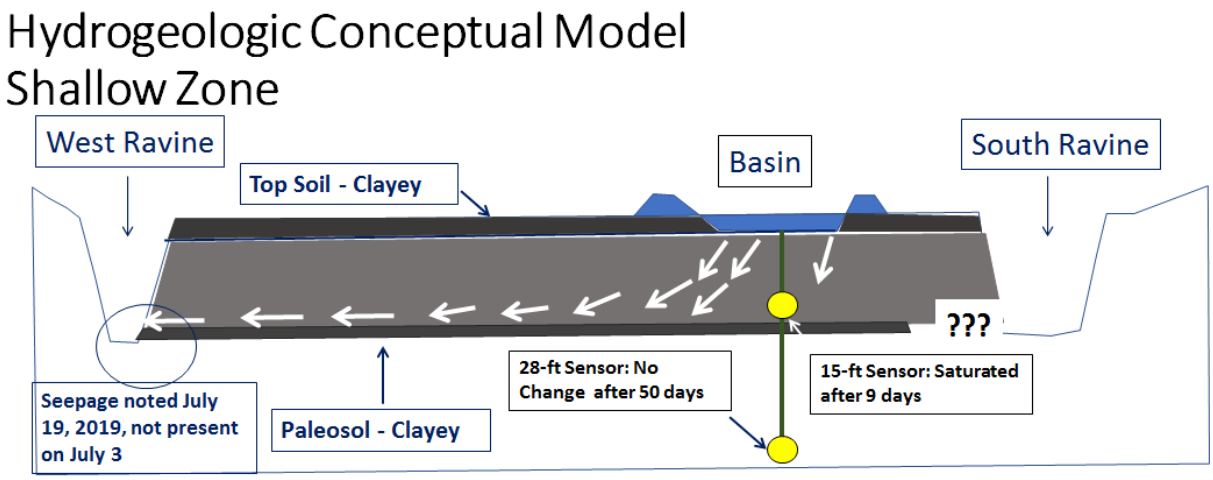
The District staff coordinated the construction of a 300 foot long and 75 feet wide recharge test basin. The testing utilized special instrumentation designed to measure changes of moisture and temperature at various depths at two separate locations to determine the rate of surface water infiltration into the groundwater basin.

On April 20, 2019, the initial test was stopped to re-evaluate the project due to slow infiltration from the ground surface to the groundwater table. The District staff drained the basin, tested the soils in the basin, and removed additional soil from the basin to reach a more permeable layer of soil. Following the modifications to the basin, the District staff and Geoscience restarted the infiltration investigation.

Based on the results of this phase of the study, the infiltration testing showed a westerly horizontal movement of the recharged water instead of traveling vertically to reach the groundwater basin.



The following illustration shows how it is possible for the recharge water to laterally instead of vertically to the groundwater basin.



As a result of the initial testing, the District staff requested a proposal from Geoscience to conduct additional geological testing in the easterly portion of the groundwater basin. On September 3, 2019, the Board of Directors authorized Geoscience to proceed with additional tasks to further evaluate the long-term infiltration rates in the westerly portion of the Beaumont Basin [Director Memorandum No. 19-097].

The additional scientific study was developed to: (1) conduct additional exploratory drilling and testing; (2) perform additional infiltration testing; (3) prepare a groundwater model that will be used to support the recharge of recycled water at this location.


GEOSCIENCE

The results of the additional geological evaluation wells provided a soil stratum that would likely facilitate direct injection of water instead of surface spreading. The operational plan for this Aquifer Storage and Recovery Project in Calimesa would involve a put-and-take operation whereby the same quantity of water injected would also be extracted in the same 12-month period. This reduces the quantity of losses that can occur in the groundwater basin if the water was stored for future use.

At this time, the most probable scenario for operating this facility would involve the direct injection of 2,890 acre feet of highly purified recycled water each year into the deep area of the groundwater basin. Drinking water extraction wells located westerly of the injection wells will extract 2,490 acre feet of drinking water each year for use in Yucaipa and Calimesa. Additionally, the recycled water injection wells will be reversed during the summer months to extract 400 acre feet of recycled water to meet the peak summer demands for recycled water.

The proposed operational plan and location of the proposed wells have been studied by Geoscience to determine the viability of this proposed system. The purpose of this agenda item is to start with the design of the initial injection well so we can test the injection capabilities of the basin.

Resolution 2021-11 is attached to provide funding for this phase of the project. The District staff intends to prepare a reimbursement resolution for the next board meeting that would allow the costs of the well drilling to be recovered from alternative funding proceeds in the future (see Director Memorandum No. 21-030).

RESOLUTION NO. 2021-11

RESOLUTION OF THE YUCAIPA VALLEY WATER DISTRICT TRANSFERRING FUNDS WITHIN THE WATER FUND AS TRANSFER NO. 16 FOR FISCAL YEAR 2021

WHEREAS, the Yucaipa Valley Water District recognizes the importance of funding projects and programs within the District with funds set aside for this purpose, and

WHEREAS, the Board of Directors has authorized Geoscience to perform professional hydrogeological services for the design, construction management, and inspection services for injection and monitoring wells for the Aquifer Storage and Recovery Project [Director Memorandum No. 21-031].

NOW, THEREFORE, the Board of Directors of the Yucaipa Valley Water District hereby RESOLVE, DETERMINE, and ORDER as follows:

Section 1: Fund Transfer No. 16 in the amount of $450,818 from the Sewer Fund Infrastructure Reserves (03-000-10311) to fund the professional hydrogeological services for the Aquifer Storage and Recovery Project.

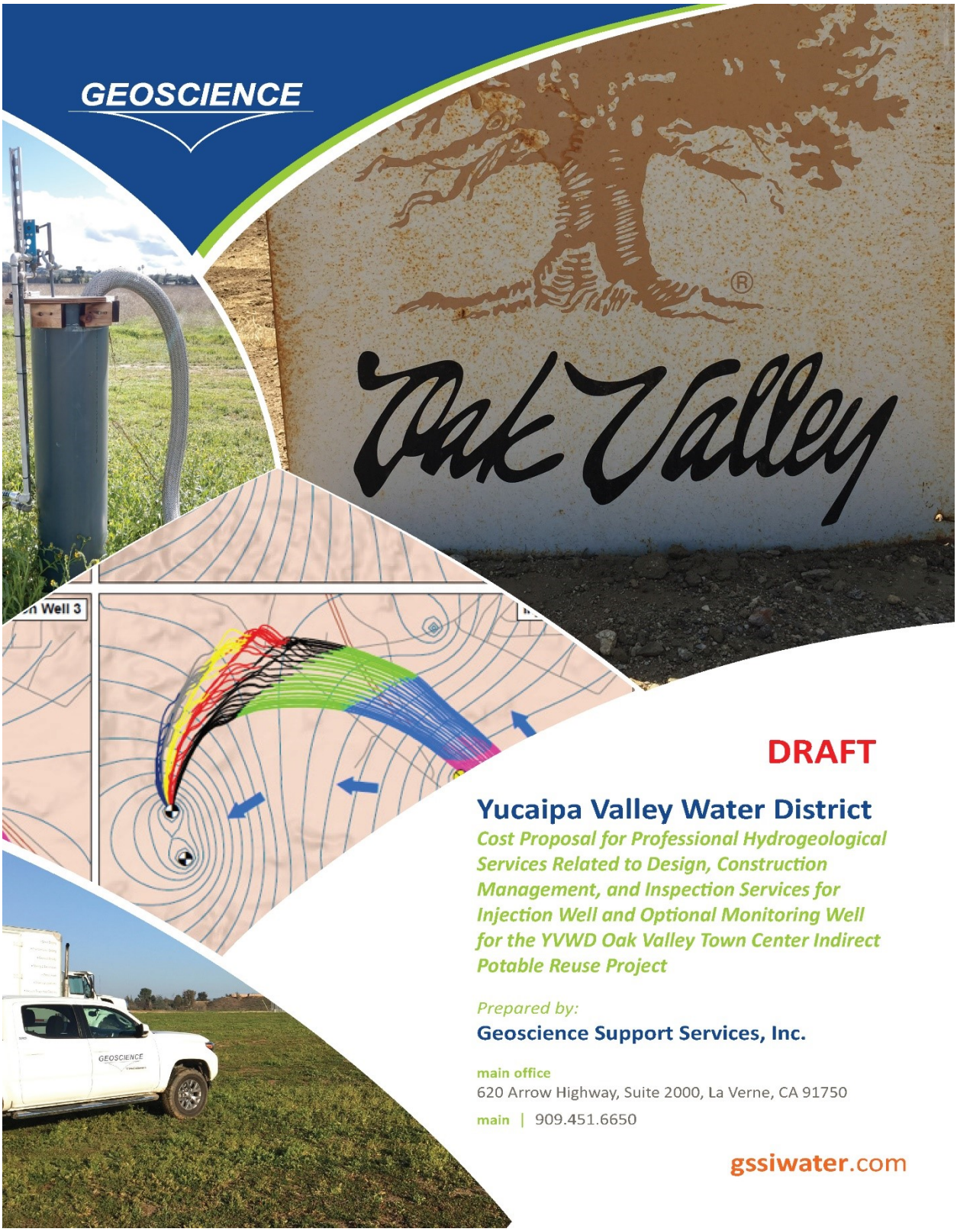
PASSED, APPROVED and ADOPTED this 23rd day of February 2021.

YUCAIPA VALLEY WATER DISTRICT

Chris Mann, President Board of Directors

ATTEST:

Joseph B. Zoba, General Manager


GEOSCIENCE
Oak Valley
DRAFT
Yucaipa Valley Water District
Cost Proposal for Professional Hydrogeological Services Related to Design, Construction Management, and Inspection Services for Injection Well and Optional Monitoring Well for the YVWD Oak Valley Town Center Indirect Potable Reuse Project
Prepared by:
Geoscience Support Services, Inc.
main office
620 Arrow Highway, Suite 2000, La Verne, CA 91750
main | 909.451.6650
gssiwater.com

PROJECT OVERVIEW

The proposed next phase of the Yucaipa Valley Water District Oak Valley Town Center Indirect Potable Reuse Project is to construct one injection well (IW-1) and one (optional) monitoring well (MW-1) for the purpose of acquiring objective aquifer data and to determine site-specific groundwater level effects from proposed future recycled water injection. The data collected during pumping and injection tests would be used to refine current groundwater model parameters and to determine baseline basin groundwater quality in the zones where future injection wells are planned to be constructed. One optional monitoring well could be placed at a targeted location to better refine estimates of aquifer characteristics, mounding effects, and travel times. Results from this study, along with feedback from Yucaipa Valley Water District (YVWD) and Oak Valley Partners, would be used to select the optimal placement of the remaining three proposed injection wells and two recovery wells.

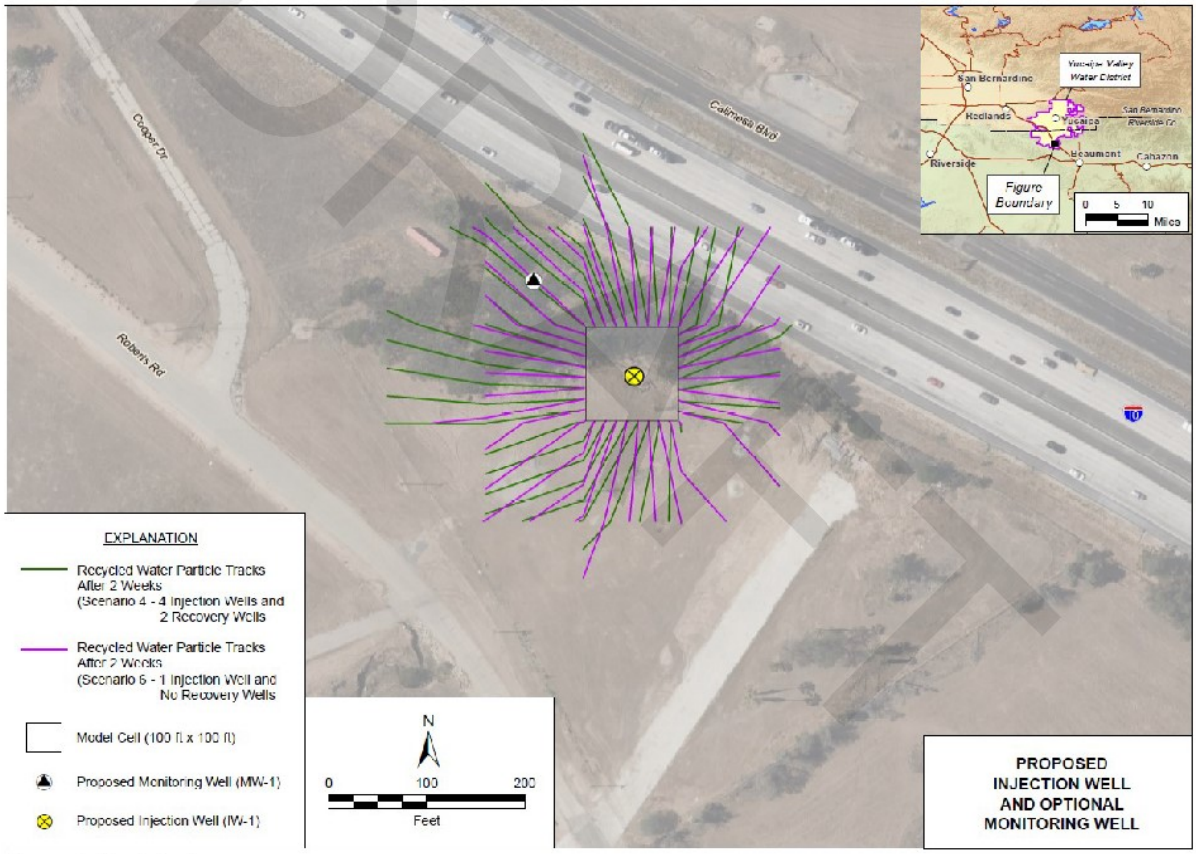


Figure 1: Project site.

As a part of the proposed work, we recommend, as an optional task a geochemical analysis of the potential effects of recycled water injectate into the future Oak Valley Town Center site. The purpose of this study would be to evaluate any potential adverse effects from recycled water injection based on injection water and site-specific aquifer water chemistries and lithologic data. If YVWD would like to pursue this investigation, Dr. Scott Fendorf (Stanford University), an expert in soil science and geochemistry, can provide scope and cost for these analyses. Dr. Fendorf has experience in injection and

recovery projects and will be able to offer procedural recommendations for addressing potential water quality issues.

SCOPE OF WORK

1.0 KICK-OFF MEETING AND PERMITTING

1.1 Project Kick-Off Meeting, Status Update Meetings, and Conference Calls

The primary objective of the project kick-off meeting will be to meet virtually with key project individuals from our team, Oak Valley Partners, and Yucaipa Valley Water District personnel to make sure that everyone understands the intent, objectives, tasks, budgets, schedules, milestones, and deliverables of this project. This meeting provides a forum for discussion of critical path tasks, such as data collection, so those tasks can be efficiently expedited.

Geoscience will review current modeling flow path scenario results and lithologic information and assess existing conditions and data requirements prior to attending the kick-off meeting. Other objectives of the kick-off meeting include (but are not necessarily limited to):

- Clarification of key issues for the project
- Clarification and refinement of the scope of work based on the key issues
- Clarification of the data needs to address the scope of work
- Discussion of the project schedule

Throughout the course of the project, Geoscience will prepare for and participate in up to three (3) update meetings to discuss key milestones and update the project schedule with the Oak Valley Partners and Yucaipa Valley Water District personnel. In addition, Geoscience will participate in conference calls, as necessary. Meeting agendas will be prepared by Geoscience for all project meetings and meeting minutes will be provided, as necessary. In addition, Geoscience will prepare and provide weekly email updates throughout the course of the project.

1.2 Permitting Compliance Assistance

It is assumed that the work shall be performed under Yucaipa Valley Water District's existing National Pollutant Discharge Elimination System (NPDES) permit and that the contractor will be held responsible for NPDES compliance during construction. However, Geoscience is prepared to assist YVWD with completion of any notice of intent (NOI) documents and submit them to the appropriate regulatory agency at the start of work. In addition, Geoscience personnel will provide on-site inspection to ensure that contractor activities are meeting NPDES and Best Management Practices (BMP) requirements. This will include coordination with the contractor regarding monitoring requirements, inspection during monitoring and sampling of discharges during construction, tabulation of field monitored data, and reporting to the selected water quality analytical laboratory. Geoscience is also prepared to coordinate with any other regulatory agency, including, but not limited to, City of Calimesa, County of Riverside Department of Environmental Health, and Riverside County Flood Control and Water Conservation District.

Assumptions:

- YVWD will complete any necessary CEQA documentation.
- Work will be performed under YVWD's existing NPDES permit and the contractor will be held responsible for NPDES compliance.
- Discharges will be to local drainage. The conceptual discharge alignment will be determined in the PDR document.

2.0 PRELIMINARY DESIGN AND TECHNICAL PLANS AND SPECIFICATIONS

2.1 Data Collection

Geoscience has completed recent subsurface investigations and groundwater modeling for this project. The purpose of this data collection effort is to update existing lithologic, water level and water quality records with any new information that becomes available to better define localized hydrogeology. Sources of information will include, but not be limited to:

- Existing borehole logs
- Well construction details of near-by wells
- Groundwater elevation data
- Groundwater quality data from wells in the area
- Pumping records from local wells

Geoscience personnel shall conduct site visits and document all observed existing conditions that may affect the feasibility of a well construction project at each location. Conditions may include site access, proximity to overhead powerlines, discharge location, water source, cuttings disposal, and general constructability. The data collected in this task will serve as a basis for the preliminary design report and technical plans and specifications described below.

2.2 Prepare Preliminary Design Report

Geoscience will prepare a Preliminary Design Report (PDR) for the injection well and optional monitoring well which will address all components of the well drilling and construction process. All relevant geohydrologic data and other available background information regarding the chosen sites obtained in **Task 2.1** will be reviewed and incorporated into the PDR. Additional data will be obtained from online State of California databases and resources. This data will include, but not necessarily be limited to:

- Construction details of all existing wells in the vicinity of the production well
- Lithologic and geophysical logs from existing wells and any other exploratory boreholes that have been drilled in the area of the well site
- Existing hydrogeologic cross-sections
- All relevant pumping and aquifer test data, including nearby well performance characteristics
- Historical groundwater elevation data
- Groundwater production history
- Groundwater quality information (depth-specific, if available)
- Locations of utilities such as water transmission lines and hydrants, gas transmission lines, sewer lines and manholes, and storm drains

The PDR will summarize the data collected in **Task 2.1** and will include expected groundwater quality, groundwater levels, potential well production, potential well interference, construction logistics and conflicts, environmental issues, and appropriate Division of Drinking Water (DDW) separation distances from existing utilities infrastructure. The report will also include a preliminary design for the injection and monitoring well, a basis of design, preliminary design drawings, estimated construction costs, and a preliminary construction schedule. At a minimum, the PDR will include the following construction details:

- Expected geohydrologic conditions and impact on drilling
- Recommended well drilling method(s)
- Expected depth and diameter of the well
- Recommended casing materials and dimensions
- Depth of screened intervals
- Filter pack gradation
- Well appurtenance (i.e., sounding and gravel feed tube design)
- Site construction layout and access considerations
- Discharge and injection considerations
- Sequence of drilling operation
- Noise abatement measures to be taken during drilling

Geoscience will submit a pre-design DRAFT at 30% PDR stage in electronic format (i.e., PDF), and three (3) bound hard copies for review and comment. Geoscience will also attend one (1) preliminary design review meeting with Oak Valley Partners and Yucaipa Valley Water District personnel. Following review, comments to the DRAFT will be incorporated and Geoscience will submit three (3) bound hard copies of the FINAL PDR in addition to the report in electronic (i.e., PDF) format. The FINAL PDR will be stamped and signed by a certified professional geologist and a certified hydrogeologist with the State of California. Design drawings will be prepared with AutoCAD 2017 and will conform to Yucaipa Valley Water District standard drawing size, border, title block, and formats.

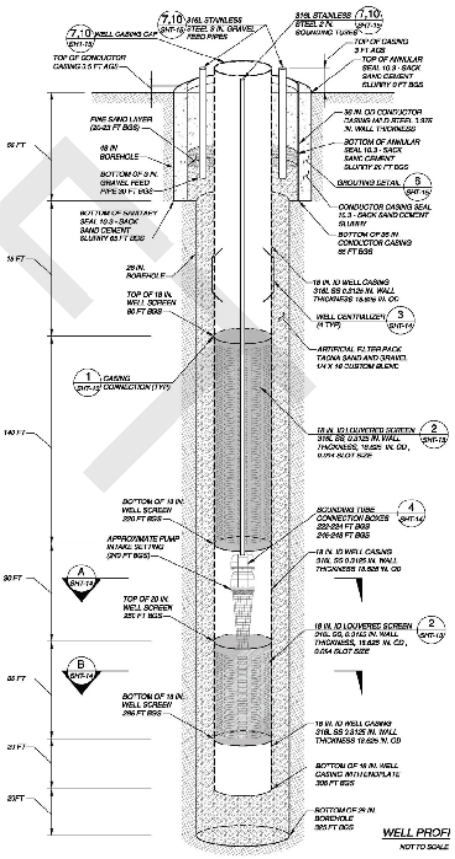


Figure 2: Example of a technical drawing of a well.

2.3 Prepare Technical Plans and Specifications

Geoscience will prepare detailed technical plans and specifications for the drilling and construction of the new injection well (IW-1), and the optional monitoring well. Items to be addressed in the technical specifications will include the following:

- Well location, depths, dimensions, and materials
- Expected geohydrologic conditions

- Permits to be acquired by the contractor
- Compliance with NPDES discharge requirements, as necessary
- Job conditions (e.g., noise suppression, drilling waste, runoff management, power, lighting, water, security, sanitation and work damage)
- Mobilization, demobilization, and site cleanup
- Recommended methods of well drilling
- Equipment, materials, and records to be furnished by the contractor
- Records to be kept by the contractor
- Well drilling, zone testing, and construction procedures, including:
    - Drilling, installation, and cementing of conductor casing
    - Pilot-borehole drilling
    - Geophysical borehole logging (i.e., short- and long-normal resistivity logs, guard or lateral logs, spontaneous-potential log, gamma ray, and sonic)
    - Isolated aquifer zone testing
    - Final borehole drilling (reaming pass)
    - Alignment, plumbness, borehole integrity, and drilling speed
    - Well casing and screen installation
    - Gravel access and sampling tube installation
    - Filter pack material selection and approved placement method
    - Annular cement seal installation
- Well development procedures, including:
    - Initial airlift development between packers
    - Development by wireline swabbing and bailing (if necessary)
    - Development by pumping
- Aquifer pumping and recovery tests, and spinner (flowmeter) survey
- Aquifer injection and recovery tests
- Downhole video camera and gyroscopic alignment surveys
- Well disinfection, well cover, and final inspection

Geoscience will submit the technical plans, specifications, and engineer's estimates, and contractor bid sheets for review and comment, to the District at the 60% and 90%, DRAFT stages in electronic format (i.e., PDF) and three (3) bound hard copies, and at 100% FINAL in electronic format (i.e., PDF) with the three (3) bound hard copies. Geoscience will also attend review meetings, as necessary, with Yucaipa Valley Water District personnel following submittal of each DRAFT. The technical plans will be prepared with AutoCAD 2017 and will conform to YVWD's standard drawing size, border, title block, and formats. All submitted DRAFT and FINAL technical plans, specifications and cost estimates shall be submitted in the correct format, size, and amounts as specified by YVWD.

3.0 CONTRACTOR BID SUPPORT

3.1 Assist with Final Bid Documents

Geoscience will assist the District with the finalizing of contractor bid documents. This will include review of YVWD front-end documents and incorporation with the technical plans and specifications. Geoscience will provide a contractor bid sheet to be utilized for the bidding process. Geoscience will also provide an engineer's estimate for planning and use in bid evaluations. Prior to issuing bid requests

Geoscience can discuss with the District whether one or two drilling contractor contracts are desired for the injection well and optional monitoring well.

3.2 Bidding Assistance, Pre-bid Meeting, and Pre-Construction Meeting

Geoscience will attend a pre-bid meeting with interested contractors, Oak Valley Partners, and Yucaipa Valley Water District personnel at the beginning of the bidding process to answer key issues in the technical specifications, and to answer all questions regarding site conditions, preliminary well design, schedule and other hydrogeologic or contractual matters.

During the bidding process, Geoscience will assist YVWD by responding to bidder's questions and preparing bid addenda, as necessary. Once the bidding process is complete, Geoscience will review and evaluate all bids received and will provide recommendations regarding award of the construction contract.

Geoscience will attend a pre-construction meeting with the selected contractor and Yucaipa Valley Water District personnel to review key issues within the contract documents and technical specifications. In addition, questions will be addressed regarding hydrogeologic and logistical matters. Items to be discussed at the meeting will include (but not be limited to) required submittals and inspections, permitting, work schedule, invoicing, and communication protocols. Additionally, at the time of the pre-construction meeting, the prospective contractor will have the opportunity to visit the well site to satisfy themselves regarding conditions that may affect equipment set up. At the time of the meeting, the contractor will have the opportunity to point out any issues that he may have regarding preparation of the site for the work.

4.0 CONSTRUCTION MANAGEMENT, FIELD INSPECTION, AND FINAL DESIGN - INJECTION WELL 1

4.1 Construction Management

Geoscience will provide construction management services during the well construction process to ensure that the geohydrologic aspects of the project are carried out in a proper and efficient manner. Construction management activities will include review of contractor submittals, weekly email updates, review of contractor invoices to ensure accuracy and completeness, review of and response to contractor Requests for Information (RFIs) and change order requests for legitimacy, preparation of a final "punch list", and filing of essential paperwork, correspondence, field notes, etc. Geoscience will coordinate contractor activities prior to mobilization. This will include verifying that the contractor has provided all submittals required by the technical specifications and that equipment delivered to the site meets the requirements of the specifications.

4.2 Conductor Installation

Full-time on-site field inspection will be provided during drilling and logging of the conductor borehole, and installation of the conductor casings and sanitary cement seals, to ensure that all materials are furnished and installed in accordance with the technical specifications and regulatory requirements.

4.3 Pilot Borehole Drilling and Geophysical Logging

Field inspection will be provided on a full-time basis during pilot borehole drilling. Formation samples will be collected at 10 ft intervals (or more frequently depending on the stratigraphy encountered). Samples will be identified as to material type and production potential by visually logging them in the field using the Unified Soil Classification System (USCS). Upon completion of the pilot borehole drilling, Geoscience personnel will provide full-time onsite inspection of the geophysical borehole logging (i.e., short- and long-normal resistivity, guard or lateral, self potential, gamma-ray, and sonic logs). For cost estimating purposes, it is assumed that the pilot borehole will be approximately 1,000 ft in depth.

4.4 Evaluate Geophysical Logs and Select Zone for Isolated Aquifer Zone Testing

Permeable and non-permeable formation material will be identified from the geophysical borehole logs and from the samples collected during drilling. Based on this information, as well as information collected during the drilling process, recommendations will be made for the selection of zones (i.e., depth intervals) for isolated aquifer zone testing. The purpose of isolated aquifer zone testing is to determine both yield and water quality from the potential completion interval(s) before determining the final well design. Based on an anticipated static water level of 130 ft and a total borehole depth of 1,000 ft, it is expected that five (5) zones for each well will be tested within the pilot borehole. Recommendations for isolated aquifer zone testing will be provided to YVWD in letterform within 24 hours of the completion of geophysical logging.

4.5 Isolated Aquifer Zone Testing

Once the depth interval for aquifer zone has been identified for selective zone testing, construction of the zone by the contractor will begin. Geoscience will provide full-time inspection during construction and testing of the zone. Geoscience always recommends that zone testing be performed at discharge rates exceeding 200 gallons per minute (gpm) to ensure that representative sampling of the aquifer is taking place and that the aquifer is being sufficiently stressed to provide the best available field data. Whenever possible, turbidity measurements taken from the discharge water should be less than 10 nephelometric turbidity units (NTUs) for at least two hours before collecting water quality samples from any given zone.

After the zone has been appropriately developed, water samples will be collected by Geoscience personnel and delivered to a California-certified water quality testing laboratory for general mineral and physical properties analysis (or any other analyses specific to the well site as may be required). For cost estimating purposes, it is assumed that the drilling contractor will be responsible for the water quality laboratory fees and will contract directly with the laboratory. Field measurements will also be collected during each zone test to determine field parameters such as pH, temperature, and electrical conductivity. Additionally, the discharge rate, and static and pumping water levels, will be measured frequently during pumping of each zone such that each zone's productivity can be determined (including pressure head and specific capacity).

The zone selection and recommended water quality analytical suite will be presented to Yucaipa Valley Water District for approval prior to implementation in the field. It is recommended that the groundwater quality samples collected from the zone testing be analyzed on a 72-hour turn-around time (i.e., rush) as the results of these analyses are integral for determining the screen interval(s) for the final well design.

4.6 Mechanical Grading Analysis

Using the visual and geophysical logs collected from the pilot borehole, up to ten (10) formation samples will be selected for mechanical grain size (i.e., sieve) analysis to assess permeability, sand migration potential, and uniformity coefficients. These analyses will be used as a basis for preparing the custom filter pack and well screen design for the well.

4.7 Preparation of Final Well Design

Although the anticipated lengths and dimensions of the well casing and screen and the materials used to manufacture them will be identified during the preliminary design phase, ultimately these details will be determined based on the results of the borehole lithology, geophysical logs, zone testing, and the desired production rate.

Use of a properly designed and installed filter pack will control sand production from the well when pumping or cleaning by backflushing. Selection of filter pack material will be determined from mechanical grading analysis, and will be designed based on industry standards regarding pack-to-aquifer ratios. The size of the screen openings will be designed to allow a minimal but acceptable amount of filter pack material to move through the screen. This controlled movement of filter pack material will permit the proper development of the filter pack and near-well zone.

Based on results from the mechanical grading analyses from **Task 4.6**, Geoscience will design the filter pack with a pack to aquifer ratio of between 4 and 20, as well as using Terzaghi's criteria for the movement of fines through the filter pack, and for the permeability of the aquifer and filter pack. Based on geophysical logs, mechanical grain size analysis, and isolated aquifer zone testing, targeted aquifers will be identified. The final well design will include recommended depth intervals and diameters for the well casing and screens, recommended borehole diameter(s), and the proper screen opening size to complement the filter pack designs. Recommended depths for the well appurtenances and deep annular seals will also be provided, as necessary. Geoscience will submit the DRAFT design recommendation letter in electronic format. Geoscience will attend one (1) design review meeting for each well prior to implementation of the FINAL design in the field. The FINAL design will incorporate comments from the design meeting and will be submitted in electronic format.

4.8 Borehole Reaming

During reaming (enlargement) of the pilot borehole to the final design diameter(s) and depth(s), part-time field inspection will be provided to ensure that the work is performed correctly, and that drilling fluid properties are maintained within the parameters defined by the technical specifications.

4.9 Installation of Casing, Screen, Filter Pack, and Annular Seal

Full-time (i.e., 24 hour) inspection will be provided during installation of the casing, screen, appurtenances, filter pack, and annular seals to ensure that all materials are furnished and placed in accordance with the recommended design and technical specifications. Prior to installation, Geoscience personnel will inspect the filter pack material and the well casing and screen for compliance with the specified well design. As the filter pack and cement seal are being installed, Geoscience personnel will

track the volume placed against the volume calculated from the caliper log to ensure that there are no voids or bridges forming within the annular space.

4.10 Initial Well Development by Airlifting and Swabbing

Initial well development by airlifting and swabbing is an extremely important component of the well completion and development process. Geoscience will provide part-time inspection during the airlift development process and will closely monitor discharge water turbidity and sand content to track the development progress of the well. For cost estimating purposes, it is assumed that the perforated interval for each well may be up to 740 ft.

4.11 Final Well Development by Pumping and Surging

Geoscience will monitor final development by pumping and surging on a full-time basis. Tests for sand content and specific capacity will be performed frequently to measure the advancement of the development process and to ensure that the well is fully developed before beginning the aquifer pumping tests.

4.12 Aquifer Pumping Tests

Once the well development process is considered complete, aquifer pumping tests will be performed to determine well and aquifer characteristics. Whenever possible, nearby wells will be monitored in order to provide interference data and enable more accurate estimation of aquifer parameters. It is recommended that nearby high-capacity wells, such as YVWD Well 48, not be pumped during the pumping or injection tests if possible, to minimize pumping interference. The following aquifer pumping tests will be performed:

- Step Drawdown Pumping Test (8 hours): Time drawdown measurements will be made to determine specific capacity and well efficiency relationships which are necessary to calculate the optimal production rate and pump setting. Typically, three to four rates are selected for pumping, beginning with the lowest rate and progressing to the highest.
- Constant Rate Pumping and Recovery Test (24 hours): Time drawdown and recovery measurements will be made to estimate aquifer parameters. If possible, nearby wells will also be monitored to obtain interference groundwater levels during the test.

Toward the end of the constant rate test, Geoscience personnel will collect groundwater quality samples and deliver them to a laboratory California-certified for analysis of water quality constituents required by the State of California's Title 22 Rule and UCMR 4 regulations. For cost estimating purposes, it is assumed that the drilling contractor will be responsible for the water quality laboratory fees and will contract directly with the laboratory. Geoscience will also provide full-time inspection of flowmeter (spinner) survey typically conducted during the latter portion of the constant rate testing and following water sample collection.

Assumptions:

- Discharge pipelines and any traffic control equipment to be provided and installed by YVWD.

4.13 Aquifer Injection Tests

Geoscience will provide full-time inspection during all aquifer injection testing to ensure that injection rates are properly maintained and adjusted, and that quality data is being collected. The following aquifer injection tests will be performed for each well:

- 6-Hour Step Injection Head Test: Time injection head measurements will be made to determine specific injection relationships that are necessary to calculate the optimal injection rate and ground water mounding characteristics. Three rates will be selected for injection, beginning with the lowest rate and progressing to the highest.
- 24-Hour Constant Rate Injection Head and Water Level Decay Test: Time injection head and water level decay measurements will be made to estimate short- and long-term injection head dynamics at the anticipated design injection rate. Nearby wells will also be monitored to obtain interference ground water levels during the testing.

Assumptions:

- YVWD will be able to supply water with adequate pressure to maintain a minimum continuous rate of 600 gpm for injection testing.
- Supply water and discharge pipelines, and any traffic control equipment to be provided and installed by YVWD.
- Additional engineering and drafting time may be required if YVWD is unable to provide a minimum flow rate of 600 gpm.

4.14 Video Survey, Plumbness and Alignment Surveys, and Final Disinfection

Following removal of the test pumping equipment and bailing of the bottom of the well, Geoscience will provide full-time inspection of final downhole video survey to document the post-construction condition of the well. Geoscience will also provide inspection of plumbness and alignment surveys, the purpose of which is to measure well verticality and alignment. Inspection of the final chlorination of the well will be provided to ensure that approved disinfection materials, concentrations, and methods are utilized by the contractor.

4.15 Wellhead Completion and Post-Construction Site Condition

Geoscience will provide inspection of the final wellhead completion to ensure that the well casing and appurtenances are finished as described by the technical specifications and/or well designs. The post-construction condition of the well site will also be inspected to ensure that all equipment, materials, and trash have been removed and that the site has been restored as closely as possible to its original condition.

4.16 Pumping and Injection test Analysis and Recommended Injection Rate

Geoscience will analyze the injection head data and provide supplemental operational parameters, including design injection rates, short- and long-term injection head characteristics, and recommended injection valve settings. It is anticipated that analysis and recommendations for both aquifer pumping and injection testing will be included within one recommendation letter for each well.

5.0 INSPECTION SUPPORT SERVICES AND FINAL WELL DESIGN FOR OPTIONAL MONITORING WELL 1

An optional monitoring well could be placed at a targeted location to better refine estimates of aquifer parameters, mounding effects, and travel times. Monitoring well screen intervals will be selected based on nearby IW-1 spinner survey findings and a lithologic comparison to select zones with the highest transmissivity within the Live Oak Formation (shortest estimated travel times). The valuable information collected from this study along with feedback from YVWD and Oak Valley Partners would be used to select the optimal placement of the remaining three proposed injection wells and two recovery wells. Following pumping and injection tests refinements of aquifer hydraulic conductivity, transmissivity, and storativity values could be incorporated into the existing groundwater model to better determine injection water travel times and flow paths. Soil samples collected during construction of the optional monitoring well would provide additional site-specific lithologic information near where future injection wells will be constructed. Water quality samples collected from the monitoring well would help establish a baseline prior to the start of injection operations.

5.1 Assist with Final Bid Documents

Geoscience will assist the District with the finalizing of contractor bid documents. This will include review of District front-end documents and incorporation with the technical plans and specifications. Geoscience will provide a contractor bid sheet to be utilized for the bidding process. Geoscience will also provide an engineer's estimate for planning and use in bid evaluations.

5.2 Bidding Assistance, Pre-bid Meeting, and Pre-Construction Meeting

Geoscience will attend a pre-bid meeting with interested contractors, Oak Valley Partners, and Yucaipa Valley Water District personnel at the beginning of the bidding process to answer key issues in the technical specifications, and to answer all questions regarding site conditions, preliminary well design, schedule and other hydrogeologic or contractual matters.

During the bidding process, Geoscience will assist YVWD by responding to bidder's questions and preparing bid addenda, as necessary. Once the bidding process is complete, Geoscience will review and evaluate all bids received and will provide recommendations regarding award of the construction contract.

Geoscience will attend a pre-construction meeting with the selected contractor and Yucaipa Valley Water District personnel to review key issues within the contract documents and technical specifications. In addition, questions will be addressed regarding hydrogeologic and logistical matters. Items to be discussed at the meeting will include (but not be limited to) required submittals and inspections, permitting, work schedule, invoicing, and communication protocols. Additionally, at the

time of the pre-construction meeting, the prospective contractor will have the opportunity to visit the well site to satisfy themselves regarding conditions that may affect equipment set up. At the time of the meeting, the contractor will have the opportunity to point out any issues that he may have regarding preparation of the site for the work.

Figure 3: Example of a drill site.

5.3 Conductor Installation

Full-time on-site field inspection will be provided during drilling and logging of the conductor borehole, and installation of the conductor casing and sanitary cement seal, to ensure that all materials are furnished and installed in accordance with the technical specifications and regulatory requirements. It is anticipated that depth of the conductor borehole and casing will be approximately 20 ft bgs. Borehole cuttings will be collected at 10 ft intervals and logged using the USCS soils classification method.

5.4 Borehole Drilling

Field inspection will be provided on a full-time basis during pilot borehole drilling to ensure that the contract documents are adhered to. Formation samples will be collected at 10 ft intervals (or more frequently depending on the stratigraphy encountered) and identified as to material type and production potential by visually logging them in the field using the USCS soils classification method. Drilling fluid properties (i.e., fluid weight, viscosity, sand content, fluid loss, wall cake thickness, and pH) will be checked at specified time intervals, and the cleaning of cuttings from the fluid reservoir will be ensured. Geoscience personnel will ensure that drift surveys are conducted accurately, with the proper equipment, and at the correct depth intervals to verify acceptable borehole drift. The contractor's pipe measurements will be witnessed, and the pipe tally checked at each connection to ensure there is an accurate accounting of drilling depth at all times.

It is assumed that the pilot borehole for the monitoring well will be drilled in two passes and may require reaming. Nevertheless, Geoscience will provide full-time inspection during any wiper or reaming passes to ensure that the work is performed correctly, and that drilling fluid is properly maintained within the parameters defined by the technical specifications.

5.5 Geophysical Logging

Upon completion of pilot borehole drilling, Geoscience personnel will provide full-time onsite inspection of the geophysical borehole logging (i.e., short- and long-normal resistivity, guard or lateral, spontaneous potential, gamma-ray, and borehole deviation survey). Geoscience will serve as witness to the logs and will collect the required number of copies per the technical specifications.

5.6 Provide Final Monitoring Well Design Recommendations

Critical to this project's success is proper and effective monitoring well design such that the desired aquifers are identified and screened for monitoring. Geoscience will provide final monitoring well design recommendations based on lithology, drilling observations, and geophysical boreholes logs. For cost estimating purposes it is assumed that there will be one design meeting per well to be held with Yucaipa Valley Water District Personnel.

5.7 Monitoring Well Construction

Full-time inspection will be provided during installation of the casing, screen, and annular materials to ensure that they are furnished and placed in accordance with the final design and technical specifications. Prior to installation, Geoscience personnel will inspect the well casing and screen for compliance with the well design. During installation, Geoscience will ensure that each joint of casing and screen is properly and accurately measured and tallied, and that casing centralizers are installed properly and at the specified intervals. As the filter pack and annular cement seals are being installed, Geoscience personnel will track the volume placed against the volume calculated from the caliper log to ensure that there are no voids or bridges forming within the annular space. An accurate tremie tally will be ensured such that the end of the tremie pipe remains within the minimum specified distance, or within, the material being placed. It is critical that the depth of the backfill material be frequently tagged to ensure proper depth of placement. Should cement be installed, and should multiple lifts be required, Geoscience will collect cement samples and place them within a bucket of drilling fluid to ensure that the cement properly cures. Delivery tickets will be collected for all material deliveries. All field changes will be recorded in the field in both written and graphical formats to facilitate preparation of accurate record drawings.

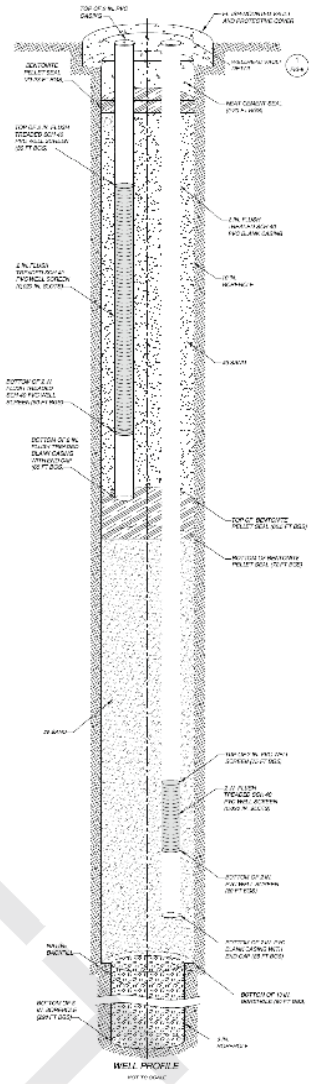


Figure 4: Example of a monitoring well design drawing.

5.8 Initial Well Development by Airlifting and Swabbing

Geoscience will provide full-time inspection during the well development process and will closely monitor field water quality and turbidity to track the development progress of the completed monitoring well. For cost estimating purposes it is assumed that well development will consist of up to 48 hours of airlifting and swabbing. Water quality parameters, including turbidity, pH, TDS, EC, temperature, and settleable solids will be measured and recorded frequently in order to track development progress.

5.9 Final Well Development by Pumping and Surging and Groundwater Sampling

Geoscience will monitor final development by pumping and surging on a full-time basis to measure the advancement of the development process and to ensure that each completion is fully developed before

the collection of ground water quality samples. Development will continue until water pumped from the well has a turbidity of less than 5 nephelometric turbidity units (NTUs) and field water quality parameters have stabilized. It is anticipated that the completed monitoring well will require approximately 40 hours of final development by pumping to produce clear water that is free of suspended sediment and considered representative of groundwater.

Geoscience will collect groundwater samples immediately following development of the monitoring well. These samples will be collected in laboratory-prepared containers and submitted under chain-of-custody protocol, to a State of California certified laboratory for analysis. Since these ground water quality analyses will provide baseline water quality signatures for the aquifer(s), it is anticipated that at a minimum, a full Title 22 water quality suite will be required. For cost estimating purposes, it is assumed that cost of analysis will be borne by the selected contractor; therefore, analysis fees are not included in this proposal. Geoscience will coordinate with the selected laboratory, acquire bottles, and deliver the samples.

5.10 Site Cleanup and Wellhead Completion

Geoscience will provide full-time inspection of the permanent wellhead completion for the new monitoring well. The post-construction condition of the well site will also be inspected to ensure that all equipment, materials, and trash have been removed and that the site has been restored as closely as possible to its original condition and in compliance with YVWD's requirements. Geoscience will inspect the completed well installation and equipping contract work and prepare a "punch list" identifying outstanding work to be completed.

6.0 COMPREHENSIVE WELL COMPLETION SUMMARY REPORT

6.1 Prepare Comprehensive Well Summary Report for New Injection and Monitoring Wells

At the conclusion of well construction activities, Geoscience will prepare a detailed final report for the well that summarizes the details of drilling, construction, development, and testing. The well completion summary report, at a minimum, will include the following:

- Chronology of activities
- Lithologic log based on the drill cuttings
- Mechanical grading analyses
- Geophysical and video survey logs
- As-built diagram of the completed well
- Analyses and results of aquifer pumping tests
- Zone test, Title 22, and UCMR 4 water quality data
- Recommended pump setting, injection rate, short- and long-term injection head characteristics
- California DWR well completion report
- Field inspection and testing reports
- An electronic photographic log
- Other pertinent data and analytical results

Geoscience will submit an electronic copy (i.e., PDF) of the 100% DRAFT report. Following review, Geoscience will incorporate comments by the District, then submit an electronic copy (i.e., PDF), three (3) bound hard copies, and three (3) DVD versions of the 100% FINAL report.

Final stamped and signed as-built drawings to be submitted as an electronic copy (i.e., PDF), one (1) full-size print, and an AutoCAD 2017 version using Yucaipa Valley Water District standard drawing size, border, title block, and formats.

7.0 GROUNDWATER MODEL UPDATES

7.1 Model Refinement after Injection Well Construction

Following the construction, development, and testing of the injection well and optional monitoring well, data summarized in the Well Summary Report discussed in **Task 6.0** will be used to refine the existing groundwater model. Specifically, the groundwater model will be refined and re-calibrated by changing local aquifer properties, such as hydraulic conductivities, transmissivities and storativities, within the Project Area based on the results from **Task 6.0**. This will allow the groundwater model to better estimate the water level changes and travel times under the project operation conditions. It is assumed that up to three (3) model runs, one (1) baseline model run and two (2) scenario model runs, will be performed and analyzed.

7.2 Model Refinement after 30-Day Long-Term Injection Test

The groundwater model will be further refined again after the Long-Term Injection Test (**Task 8.0**) to capture the confirmed injection capacity and aquifer responses to the injection identified during the 30-Day Injection Test. This will allow the groundwater model to better estimate the water level changes and travel times under the project operation conditions. It is assumed that up to two (2) model runs, one (1) baseline model run, and one (1) scenario model run, will be performed and analyzed to confirm the project impact on the groundwater aquifer.

7.3 Draft and Final Modeling Technical Memorandum

Geoscience will prepare a Draft Modeling Technical Memorandum to summarize the results from **Tasks 7.1** and **7.2**, and submit it to YVWD for review. Comments will be captured and incorporated into a Final Modeling Technical Memorandum.

8.0 INSPECTION SUPPORT SERVICES FOR 30-DAY CONSTANT RATE INJECTION HEAD TEST FOR LOCAL/REGIONAL AQUIFER ASSESSMENT

Based on the data collected from the short-term duration aquifer test and the model update (**Tasks 4.13 and 7.1**), a monitoring network will be selected to be used as observation wells for a long-term injection test. The monitoring network wells will be selected to represent the upper and lower portions of the aquifer. Observation Wells will be equipped with transducers to continuously monitor groundwater levels. The purpose of the long-term test is to assess the impact of the injection well operation on local groundwater levels. The data collected will be used to further refine the groundwater model which will

be used to refine the prediction of travel times of recycled water. The total duration of the test will be evaluated based on the data collected from the pumping test and short-term injection test. The actual duration will be adjusted based on observation well responses. For budgeting purposes, we assume the District will purchase the required number of transducers when the monitoring network is confirmed.

Assumptions:

- Temporary injection equipment will remain in place following the short-term injection test and will be used to complete the approximately 30-day injection test. Injection equipment rental cost vs. ownership cost will be evaluated in the PDR document.
- If the District elects to install and optional monitoring well, water quality samples could be collected following the injection testing at an additional cost.

9.0 OPTIONAL GEOCHEMICAL ANALYSIS

Water quality results from samples collected from the injection well, optional monitoring well, and recycled water injectate along with lithologic information are proposed to be analyzed by Dr. Scott Fendorf (Stanford University) to determine if there is potential for any temporary deleterious effects on the aquifer due to geochemical interactions. Dr. Fendorf has experience with injection water projects and has offered guidance on other large-scale injection and recovery projects including Orange County Water District's Groundwater Replenishment System. He will be able to provide operational recommendations if potential geochemical issues are found. If a project investigation by Dr. Fendorf is desired by YVWD, he can provide a proposal with scope of the analyses to be performed along with his resume at a later date.

10.0 PROJECT MANAGEMENT AND ADMINISTRATION

Effective control of a project's scope, schedule, and budget is fundamental to achieving a quality project. Our Project Team knows that understanding and managing the interrelationship of these three elements largely determines the project's success with respect to budget. Scope creep increases cost and produces delay. Delays increase costs and cause critical milestones to be missed. Geoscience understands these issues and has demonstrated ability to organize tasks, manage level of effort, develop and monitor critical-path schedules, and compare actual costs to planned costs at key milestones. By using these organizational techniques as well as good communication and coordination, a quality, on-time, and on-schedule project is ensured.

Geoscience will provide project management services throughout the entire injection and monitoring well construction (optional) project to ensure that all aspects of the project are carried out in a proper and efficient manner. Project management activities will include (but not necessarily be limited to) coordination and correspondence with the project team and YVWD personnel, project schedule updates, project budget monitoring, and quality control and assurance. This task will also include availability to assist with any unforeseen issues which may arise throughout the course of the project.

Anticipated Future Costs Based on Current Rates and Proposal Design Details

Contractor and Material Costs – One Injection Well
$1,600,000
Contractor and Material Costs – One Optional Monitoring Well
$260,000
Permanent Baski Valve for Injection Well
$75,000

Cost Proposal for Professional Hydrogeological Services Related to Design, Construction Management, and Inspection Services
For Injection Well and Optional Monitoring Well for the YVWD Oak Valley Town Center Indirect Potable Reuse Project

		Task Description	GEOSCIENCE SUPPORT SERVICES, INC. Principal Modeler	Principal Hydrologist	Project Modeler	Senior Geohydrologist	Project Geohydrologist	Modeler III	Staff Geohydrologist	Technical Illustrator	Clerical	Labor	Reimbursable Expenses[1]	Total Cost
		Hourly Rate:	$286	$271	$237	$233	$207	$204	$165	$150	$106			
1.0		**KICK-OFF MEETING and PERMITTING**												
	1.1	Prepare for and Attend Kick-Off Meeting, Status Update Meetings, and Conference Calls (assumes one [1] kick-off meeting, three [3] status update meetings, and weekly Conference Calls with Key Project Personnel)		6		18	24					$ 10,788	$ -	$ 10,788
	1.2	Provide Assist with Preparation of Permitting. Preparation of NOI (assumes contractor will operate under YVWD statewide NPDES permit), preparation of Flood Control temporary accesss easement, traffic control plan, and County Health drilling permit. Assumes all filng and permit fees will be paid by others.		4		8	24		12	24		$ 13,496	$ -	$ 13,496
		Subtotal	*0*	*10*	*0*	*26*	*48*	*0*	*12*	*24*	*0*	*$ 24,284*	*$ -*	*$ 24,284*
2.0		**PRELIMINARY WELL DESIGN and TECHNICAL SPECIFICATIONS**												
	2.1	Data Collection and Review of Proposed Injection Well Sites; Well Site Reconnaissance to Evaluate Existing Facilities and Potential Construction Impacts for Preliminary Design Evaluation.		2		6	12		24			$ 8,384	$ -	$ 8,384
	2.2	Prepare Preliminary Well Design Report (assumes electronic submittal of 30% DRAFT and three [3] bound hard copies, attendance at one design review meeting, and electronic submittal and three [3] bound hard copies of 100% Final Version)		10		12	24		40	20	4	$ 20,498	$ 200	$ 20,698
	2.3	Prepare Detailed Technical Plans, Drawings, and Specifications for Construction (assumes electronic Submittal of 60% and 90% DRAFT; electronic submittal and three [3] bound hard copies of 100% FINAL Versions, and attend one [1] technical specification review meeting)		16	20	10	36		24	60	4	$ 32,242	$ 200	$ 32,442
		Subtotal	*0*	*28*	*20*	*28*	*72*	*0*	*88*	*80*	*8*	*$ 61,124*	*$ 400*	*$ 61,524*
3.0		**BID SUPPORT and PRE-BID MEETING**												
	3.1	Assist with Final Bid Documents - assumes YVWD will assemble final bid package using existing front end documents.		2		8						$ 2,406	$ -	$ 2,406
	3.2	Provide Assistance During Bidding Process; Prepare for and Attend Pre-Bid Meeting (Includes Response to Bidder Questions, Prepare Bid Addenda, Clarifications, Evaluation of Bids and Revision of Drawings and Contract Documents, As Necessary)		6		4	20					$ 6,698	$ -	$ 6,698
		Subtotal	*0*	*8*	*0*	*12*	*20*	*0*	*0*	*0*	*0*	*$ 9,104*	*$ -*	*$ 9,104*

Yucaipa Valley Water District
Oak Valley Town Center Indirect Potable Reuse Project

Task Description			GEOSCIENCE SUPPORT SERVICES, INC.											
			Principal Modeler	Principal Hydrologist	Project Modeler	Senior Geohydrologist	Project Geohydrologist	Modeler III	Staff Geohydrologist	Technical Illustrator	Clerical	Labor	Reimbursable Expenses[1]	Total Cost
		Hourly Rate:	$286	$271	$237	$233	$207	$204	$165	$150	$106			
4.0	**INSPECTION SUPPORT SERVICES and FINAL WELL DESIGN for INJECTION WELL 1[3]**													
	4.1	Provide Construction Management (Includes QA/QC, Contractor Submittal Review, Response to RFI's, Construction Updates, Invoice Review, and Change Order Review) and Prepare and Attend Pre-Construction Meeting		8		8	24					$ 9,000	$ -	$ 9,000
	4.2	Inspect Conductor Borehole Drilling, Casing Installation, and Sanitary Seal (full-time inspection)				1	2		20			$ 3,947	$ 290	$ 4,237
	4.3	Inspect Pilot Borehole Drilling, Sampling of Cuttings, and Geophysical Borehole Logging (full-time inspection)		6		4	16		80			$ 19,070	$ 1,250	$ 20,320
	4.4	Evaluate Geophysical Borehole Logs and Select Zone for Isolated Aquifer Zone Testing (assumes five [5] zones)		1		2	8		6	2		$ 3,683	$ -	$ 3,683
	4.5	Inspect Isolated Aquifer Zone Testing for Yield and Water Quality[2] (assumes part-time Inspection of five [5] zones)		5		5	20		110			$ 24,810	$ 3,000	$ 27,810
	4.6	Perform Mechanical Grading Analyses (assumes ten [10] samples)		1		1	1		12			$ 2,691	$ -	$ 2,691
	4.7	Prepare Final Design of Casing, Screen, Filter Pack, and Annular Seal, Design review meeting		2		3	20		12	4		$ 7,961	$ -	$ 7,961
	4.8	Inspect Reaming (Enlargement) of Pilot Borehole and Caliper Survey (assumes part-time inspection)		1		2	5		40			$ 8,372	$ 1,250	$ 9,622
	4.9	Inspect Installation of Casing, Screen, Filter Pack, and Annular Seal (assumes full-time inspection)		2		2	6		66			$ 13,140	$ 1,250	$ 14,390
	4.10	Inspect Initial Development By Swabbing and Airlifting (assumes 740 ft of perforated interval; part-time inspection)		2		4	10		74			$ 15,754	$ 1,450	$ 17,204
	4.11	Inspect Final Development By Pumping and Surging (assumes as neeeded inspection)		1		2	5		40			$ 8,372	$ 1,250	$ 9,622
	4.12	Inspect Aquifer Pumping Tests, Spinner Survey, Collect Title 22 and Water Quality Samples[2], and Deliver to Lab (assumes full-time inspection of step test, and part-time inspection of 24-Hour constant rate test and recovery measurements)[4]		1		2	4		38			$ 7,835	$ 750	$ 8,585
	4.13	Inspection of 6-Hr Injection Head Step Test, 24-Hour Continuous Injection Head Test, and Recovery/Equilibration Test (assumes full-time inspection of step test, and part-time inspection of 24-Hour injection test and recovery measurements)[4]		1		2	4		38			$ 7,835	$ 750	$ 8,585
	4.14	Inspect Downhole Video Survey and Plumbness/Alignment Surveys; Inspect Final Disinfection (assumes full-time inspection)				1	2		20			$ 3,947	$ 500	$ 4,447
	4.15	Inspect Wellhead Completion, Post-Construction Site Condition, and Prepare Final Punch-List to Contractor				2	8					$ 2,122	$ 145	$ 2,267
	4.16	Analyze Aquifer Pumping and Injection Tests and Prepare Letter Presenting Recommendations for Injection Head Characteristics		1		6	12		20	2	1	$ 7,859	$ -	$ 7,859
		Subtotal	*0*	*32*	*0*	*47*	*147*	*0*	*576*	*8*	*1*	*$ 146,398*	*$ 11,885*	$ 158,283

Yucaipa Valley Water District
Oak Valley Town Center Indirect Potable Reuse Project

Task Description			GEOSCIENCE SUPPORT SERVICES, INC.											
			Principal Modeler	Principal Hydrologist	Project Modeler	Senior Geohydrologist	Project Geohydrologist	Modeler III	Staff Geohydrologist	Technical Illustrator	Clerical	Labor	Reimbursable Expenses[1]	Total Cost
		Hourly Rate:	$286	$271	$237	$233	$207	$204	$165	$150	$106			
5.0	**INSPECTION SUPPORT SERVICES and FINAL WELL DESIGN for OPTIONAL MONITORING WELL 1[3]**													
	5.1	Technical Specification and Bid Documents for Monitoring Well		2			4		12			$ 3,350	$ -	*$ 3,350*
	5.2	Bid Support for Monitoring Well		2		4	8		40			$ 9,730	$ -	*$ 9,730*
	5.3	Inspect Conductor Borehole Drilling, Casing Installation, and Sanitary Seal (Full-Time Inspection)		2			4		12			$ 3,350	$ 145	*$ 3,495*
	5.4	Inspect Borehole Drilling including Sampling of Cuttings (Full-Time Inspection)		2		4	8		40			$ 9,730	$ 1,250	*$ 10,980*
	5.5	Inspection During Geophysical Borehole Logs				1	2		10			$ 2,297	$ -	*$ 2,297*
	5.6	Prepare Final Design of Monitoring Well Design. Assumes Draft and Final Submittal. Includes Design review Conference Call		2		4	8		8	4	2	$ 5,262	$ -	*$ 5,262*
	5.7	Inspect Installation of Casing, Screen, Filter Pack, and Annular Seal (Full-Time Inspection)		2		2	8		16			$ 5,304	$ 145	*$ 5,449*
	5.8	Inspect Development By Airlifting, Swabbing (assumes part-time Inspection)				2	4		30			$ 6,244	$ 580	*$ 6,824*
	5.9	Inspect Final Development By Pumping and Surging, Collect Title 22 and Water Quality Samples[2], and Deliver to Lab (assumes part-time inspection)				2	4		32			$ 6,574	$ 1,000	*$ 7,574*
	5.10	Inspection During Site Cleanup, Wellhead Completion, and Post-Construction Site Condition and Final Punch-List Items				2	8		3			$ 2,617	$ 145	*$ 2,762*
		Subtotal	*0*	*12*	*0*	*21*	*58*	*0*	*203*	*4*	*2*	*$ 54,458*	$ 3,265	*$ 57,723*
6.0	**COMPREHENSIVE WELL COMPLETION SUMMARY REPORT and RECORD DRAWINGS**													
	6.1	Prepare Comprehensive Well Summary Report Which Includes Project Overview of Construction Project (assumes one report for all Injection wells and monitoring wells; 100% DRAFT submittal in electronic, 100% FINAL submittals in electronic and three (3) bound hardcopies)		8		20	32		40	32	4	$ 25,276	$ -	$ 25,276
		Subtotal	*0*	*8*	*0*	*20*	*32*	*0*	*40*	*32*	*4*	*$ 25,276*	$ -	$ 25,276
7.0	**GROUNDWATER MODEL UPDATES**													
	7.1	Update existing groundwater model with new data from the Well Completion Summary Report [Task 6.0] (up to three [3] model runs, one [1] baseline model run, and two [2] scenario model runs).	5		38			78				$ 26,348	$ -	$ 26,348
	7.2	Update existing groundwater model with new data from the 30-Day Long-Term Injection Test [Task 8.0] (up to two [2] model runs, one [1] baseline model run, and one [1] scenario model run).	5		20			38				$ 13,922	$ -	$ 13,922
	7.3	Prepare a DRAFT and FINAL Modeling Technical Memorandum to summarize results from Tasks 7.1 and 7.2 (assumes 100% DRAFT submittal in electronic, 100% FINAL submittals in electronic and three (3) bound hardcopies).	5		30			50		24	4	$ 22,764	$ -	$ 22,764
		Subtotal	*15*	*0*	*88*	*0*	*0*	*166*	*0*	*24*	*4*	*$ 63,034*	$ -	$ 63,034
8.0	**INSPECTION SUPPORT SERVICES FOR 30-DAY CONSTANT RATE INJECTION HEAD TEST FOR LOCAL/REGIONAL AQUIFER ASSESSMENT**													
	8.1	Inspection of 30-Day Continuous Injection Head Test and Recovery/Equilibration Test (assumes part-time inspection of 30-Day constant injection test and recovery measurements)[2,4,5]		7		15	50		105			$ 33,067	$3,805	$ 36,872
		Subtotal	*0*	*7*	*0*	*15*	*50*	*0*	*105*	*0*	*0*	*$ 33,067*	*$ 3,805*	$ 36,872

Yucaipa Valley Water District
Oak Valley Town Center Indirect Potable Reuse Project

Task Description			GEOSCIENCE SUPPORT SERVICES, INC.											
			Principal Modeler	Principal Hydrologist	Project Modeler	Senior Geohydrologist	Project Geohydrologist	Modeler III	Staff Geohydrologist	Technical Illustrator	Clerical	Labor	Reimbursable Expenses[1]	Total Cost
		Hourly Rate:	$286	$271	$237	$233	$207	$204	$165	$150	$106			
9.0	**OPTIONAL GEOCHEMICAL ANALYSIS**													
	9.1	Geochemical analysis report by Dr. Scott Fendorf to determine any potential temporary deleterious effects on the aquifer due to geochemical interactions.										$ -	$ -	TBD
		Subtotal	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*$ -*	*$ -*	$ -
		TOTAL HOURS and COST (OPTIONAL ITEM 9):	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**TBD**
10.0	**PROJECT MANAGEMENT and ADMINISTRATION**													
	10.1	Project Management and Administration		10		16	40					$ 14,718	$ -	$ 14,718
		Subtotal	*0*	*10*	*0*	*16*	*40*	*0*	*0*	*0*	*0*	*$ 14,718*	*$ -*	$ 14,718
		TOTAL HOURS and COST (TASKS 1 - 4, 6 - 8, and 10):	**15**	**103**	**108**	**164**	**409**	**166**	**821**	**168**	**17**	**377,005**	**16,090**	**$ 393,095**
		TOTAL HOURS and COST (TASKS 1 - 4, 6 - 8, 10 and OPTIONAL TASK 5):	**15**	**115**	**108**	**185**	**467**	**166**	**1,024**	**172**	**19**	**431,463**	**19,355**	**$ 450,818**

Notes:

[1] Reimbursable expenses include mileage, field per diem at $145/day and $250/day for tasks requiring overnight stay, and report reproduction costs.

[2] Laboratory costs for ground water quality analyses are not included.

[3] All well construction supervision costs assume a total borehole depth of approximately 1,000 and 600 ft below ground surface for IW-1 and MW-1 respectively. Additional inspection beyond that outlined in this cost proposal can be provided, as necessary, on a time and materials basis.

[4] Water level monitoring equipment (data loggers, cables, and accessory equipment) costs are not included.

[5] Includes flowmeter, pressure gage, and telemetry skid rental rate at $75/day.

It should be noted that additional costs, which cannot be foreseen at this time, are sometimes incurred due to equipment breakdowns on the part of the drilling contractor, and/or problems in material procurement or construction. Additional inspection hours for such field-related problems are not included in the above costs.

GEOSCIENCE is aware of the requirements of California Labor Code Sections 1720 et seq. and 1770 et seq., which require the payment of prevailing wage rates and the performance of other requirements on certain "public works" and "maintenance" projects. the work GEOSCIENCE performs does not fall under prevailing wage rate categories.

GEOSCIENCE

The First Name in Groundwater

gssiwater.com

Yucaipa Valley Water District

Director Memorandum 21-032

Date: February 23, 2021

Prepared By: Joseph B. Zoba, General Manager

Subject: Consideration of Participating in the Preparation of a Salt and Nutrient Plan for the Bunker Hill Groundwater Basin

Recommendation: That the Board authorizes the participation in the Salt and Nutrient Plan for a sum not to exceed $23,654.

On January 19, 2021, the San Bernardino Valley Municipal Water District Board of Directors approved the preparation of the Salt and Nutrient Management Plan for the Upper Santa Ana River Watershed Groundwater Basins in the amount of $473,073. The consultants include Water System Consulting, Geoscience Support Services, LeClaire & Associates, and Woodard & Curran. Because this is a regional planning effort that will have watershed-wide benefits, Valley District's cost-share is 50% of the project cost ($236,537).

The Salt and Nutrient Management Plan will use a collaborative, phased approach as summarized below:

- Phase 1 will perform a water quality analysis of the groundwater management zones to compute historical and existing TDS and nitrate concentrations using data from 1990 to 2018, characterize any significant trends, and compute the current, available assimilative capacity, if any, for TDS and nitrate.

- Phase 2 will utilize the Integrated Santa Ana River Water Quality Model to evaluate the groundwater management zones with the proposed stormwater capture projects, anticipated SWP imports and recycled water projects. Phase 2 will also evaluate localized water quality impacts to specific drinking water wells, if any. If the Phase 2 analysis indicates that an increase in water quality objectives is possible, the Stakeholders would then obtain a proposal for Phase 3 to develop a formal SNMP for submission to the Regional Board.

- Phase 3 (optional) will develop a Salt and Nutrient Management Plan that would provide a detailed description of the proposed projects along with the proposed water quality monitoring program and any other commitments required by the RWQCB. The Salt and Nutrient Management Plan would then be used as backup for a request that the objectives be raised by the RWQCB. This type of process has occurred in other areas, including the Yucaipa Basin, and has often been referred to as a "maximum benefit" analysis because of the need to demonstrate that the findings maintain high quality of waters in California and deliver maximum benefit to the people of the State.

Upper Santa Ana River Watershed Salt and Nutrient Management Plan

Water Systems Consulting Proposal

Total Proposal Cost - WSC		**$473,073**
Project Management:	$	123,693
Phase 1 Total (Tasks 1-5):	$	156,372
Phase 2 Total (Tasks 6-10):	$	193,008
SBVMWD 50% of Regional Planning Effort:	$	(236,537)
Balance of Project to Participates:	$	236,536
Revised Total Cost per Phase:		
Project Management:	$	61,847
Phase 1 Total (Tasks 1-5):	$	78,186
Phase 2 Total (Tasks 6-10):	$	96,504
	$	236,537

COST SHARING BY AGENCY

	Agency	Project Management	Phase 1	Phase 2	TOTAL PROPOSAL
1	Western Municipal Water District	$ 6,185	$ 7,819	$ 9,650	$ 23,654
2	City of Colton	$ 6,185	$ 7,819	$ 9,650	$ 23,654
3	City of Redlands	$ 6,185	$ 7,819	$ 9,650	$ 23,654
4	City of Rialto	$ 6,185	$ 7,819	$ 9,650	$ 23,654
5	City of Riverside Public Utilities	$ 6,185	$ 7,819	$ 9,650	$ 23,654
6	East Valley Water District	$ 6,185	$ 7,819	$ 9,650	$ 23,654
7	San Bernardino Municipal Water Department	$ 6,185	$ 7,819	$ 9,650	$ 23,654
8	San Bernardino Valley Water Conservation District	$ 6,185	$ 7,819	$ 9,650	$ 23,654
9	San Gorgonio Pass Water Agency	$ 6,185	$ 7,819	$ 9,650	$ 23,654
10	Yucaipa Valley Water District	$ 6,185	$ 7,819	$ 9,650	$ 23,654
		$ 61,847	$ 78,186	$ 96,504	$ 236,537

Actual Cost	$ -
Under Budget	$ (236,537)

SEPTEMBER 14, 2020

PROPOSAL FOR **SAN BERNARDINO VALLEY MUNICIPAL WATER DISTRICT**

SAN BERNARDINO Valley MUNICIPAL WATER DISTRICT

Preparation of a Salt & Nutrient Management Plan

for the **UPPER SANTA ANA RIVER WATERSHED GROUNDWATER BASINS**

WSC
WATER SYSTEMS CONSULTING, INC.

Mr. Matt Howard
Water Resources
Senior Project Manager

San Bernardino Valley
Municipal Water District

380 East Vanderbilt Way
San Bernardino, CA 92408

(909) 387-9230
MattH@sbvmwd.com

Water Systems Consulting (WSC)

LOCAL OFFICE

9375 Archibald Ave.
Suite 200

Rancho Cucamonga,
CA 91730

P: (909) 483-3200

F: (909) 354-3482

Project Manager
Michael Cruikshank PG, CHG

(949) 528-0960, ext 601

mcruikshank@wsc-inc.com

F: (909) 354-3482

Principal in Charge
Jeff Szytel PE, MS, MBA

(805) 457-8833, ext. 101

jszytel@wsc-inc.com

PROPOSAL FOR PREPARATION OF A SALT AND NUTRIENT MANAGEMENT PLAN FOR THE UPPER SANTA ANA RIVER WATERSHED GROUNDWATER BASINS

Mr. Matt Howard

San Bernardino Valley Municipal Water District (Valley District) is seeking assistance in preparing a Salt and Nutrient Management Plan (SNMP) for the Santa Ana River Watershed Groundwater Basins.

Water Systems Consulting, Inc. (WSC), has partnered with LeClaire & Associates (L&A), Geoscience Support Services (Geoscience), and Woodard & Curran (W&C) for this project. Each member of our team brings expertise to the Valley District, its stakeholders, and the previous technical work that will be analyzed for this project. Together, we have unparalleled insight into the Santa Ana River Watershed groundwater basins and the experience to complete a project that achieves the Valley District's goals and exceeds your expectations.

The WSC team is poised to deliver:

A Quick Start. Through our work on the Ambient Water Quality Recomputation and Integrated Santa Ana River Model (Integrated SAR Model), we have and understand the data and model required to complete this project. This enables us to immediately begin work on this project and means that we do not need time to familiarize ourselves with the relevant studies, data, and tools. This will increase the value and effectiveness of the project through our unmatched insight into and familiarity with the prior work.

Stakeholder Buy-in. The WSC team has a long, productive history with the Valley District and its stakeholder agencies. Our strong, trusted relationships throughout the region will allow our team to effectively work together with the project's stakeholders to build consensus on key decision points. We have built those relationships by delivering valuable solutions for the stakeholder agencies. Two directly relevant examples are WSC's work developing the Ambient Water Quality Recomputation project, which will supply much of the data required for this project, and Geoscience's work developing the Integrated SAR Model, which will be used to evaluate projects.

Regional Board Acceptance. This project is vital for the permitting of several important projects in the region, including the Sterling National Resources Center. The WSC team has successfully completed numerous projects that required Regional Board acceptance. We understand their requirements, have strong relationships with their staff, and will provide the information they need to make this critical project a success. The Regional Board's approval is a core pillar of our approach.

WSC is in significant agreement with the Consulting Services Agreement provided in the RFP. WSC has existing contracts with the Valley District and we are confident that we can quickly and efficiently come to mutually agreed upon terms.

Members of our team live and work in watershed and recognize the stewardship of our resources by the Valley District and all of the stakeholders in the basin. We are proud to have contributed to the sustainable management of our groundwater supplies in the past and we hope to continue that work with this project.

Thank you for this opportunity to submit our proposal. We look forward to partnering with the Valley District on this important endeavor. Please do not hesitate to contact WSC's proposed Project Manager, Michael Cruikshank, or our proposed Principal in Charge, Jeff Szytel, if you have any questions.

Sincerely,
Water Systems Consulting, Inc.

Michael Cruikshank PG, CHG, MS
Project Manager

Jeff Szytel PE, MS, MBA
Principal in Charge / WSC President

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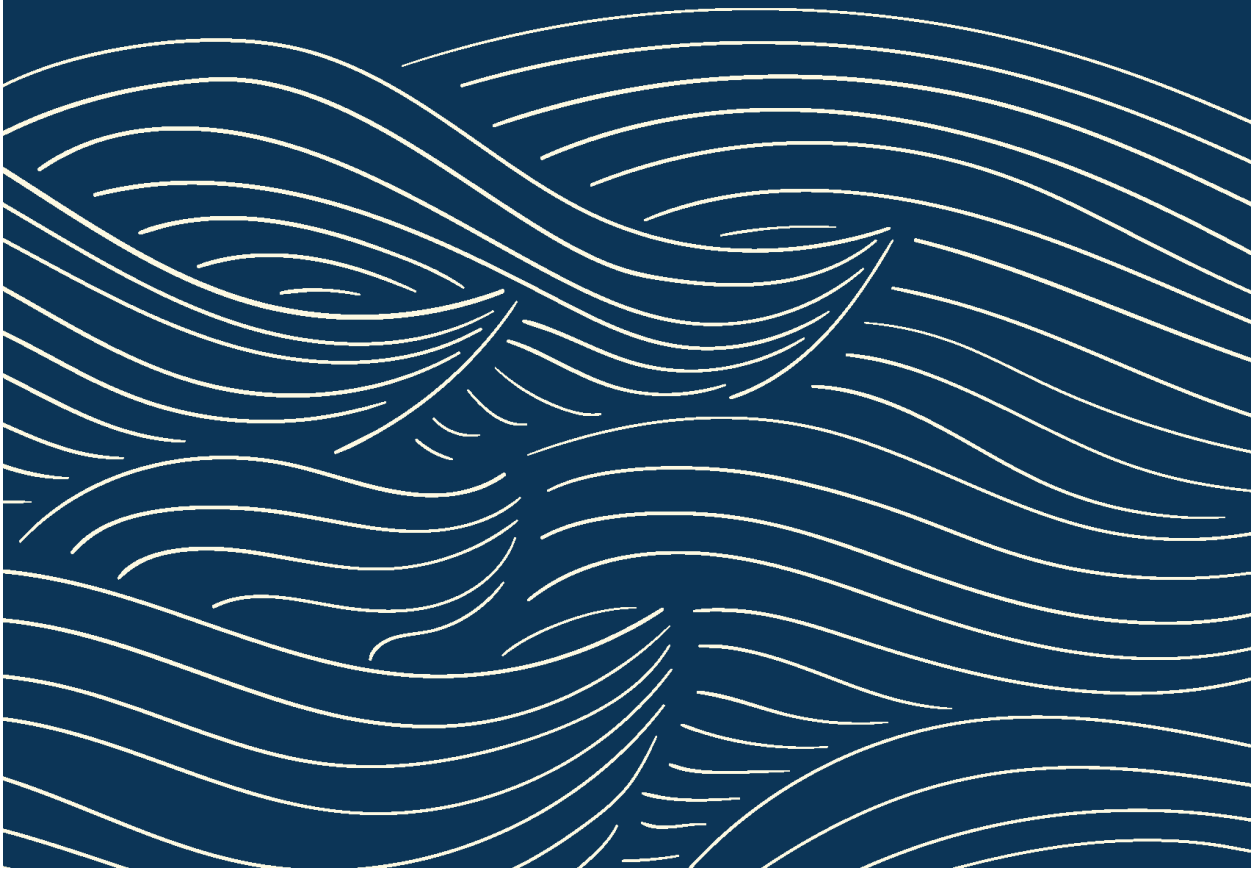


PROJECT UNDERSTANDING

Unmatched Local Knowledge

WSC and our partners LeClaire & Associates, Geoscience Support Services, and Woodard & Curran, are the premier groundwater experts in the Santa Ana River Watershed.

- Relationships First
- Tailored Innovation
- Holistic Solutions
- Unrelenting Performance

The San Bernardino Valley Municipal Water District (Valley District), on behalf of the Upper Santa Ana River Watershed Stakeholders and in cooperation with the Santa Ana Regional Water Quality Control Board, is developing a Salt and Nutrient Management Plan (SNMP) required to scientifically evaluate, permit and implement various water resource management projects in the San Bernardino Basin Area (SBBA). The overall objective is to develop a scientific framework where various projects and management strategies can be objectively evaluated for inclusion in the SNMP as viable projects that could enhance the water supply reliability in the region. The SNMP will evaluate the projects on an individual groundwater management zone basis (eg. Bunker Hill-A, Bunker Hill-B, Lytle, etc..) and a combined SBBA groundwater management zone.

Stakeholders in the region have invested in the development of Integrated Santa Ana River Model (Integrated SAR Model) for the Upper Santa Ana Valley Groundwater Basin and continue to improve and add functionality to the model. The model was built to support groundwater management in the Upper Santa Ana River and evaluate projects like the SNMP.

The SBBA Stakeholders include:

- Western Municipal Water District
- San Bernardino Valley Water Conservation District
- San Gorgonio Pass Water Agency
- City of San Bernardino Municipal Water Department
- Yucaipa Valley Water District
- East Valley Water District
- City of Riverside Public Utilities
- City of Redlands
- City of Rialto
- City of Colton
- County of San Bernardino Public Works
- Elsinore Valley Municipal Water District

The SNMP Stakeholders Must Achieve:

A Quick Start

The Integrated SAR Model that will be used for this project has been in development for more than two years and is sophisticated. Valley District needs a consultant that is confident using the model and interpreting the results. WSC's team includes Geoscience who is developing the model, which enables us to efficiently use the model.

Stakeholder Buy-In

This project presents an opportunity for the SBBA stakeholders to work together for the benefit of the entire region. Our understanding of their drivers and relationships with their staff enables this project to proceed smoothly and with buy-in from each party. WSC's team has a long history working in the region and bringing together this stakeholder group.

Regional Board Acceptance

Several projects are already underway that depend on this project being accepted by the Regional Board. Members of WSC's team have successfully worked with the Regional Board for more than 30 years and we have built strong relationships and understanding of their requirements.

A Successful SNMP Enhances Water Supply Reliability

1 The Santa Ana River Watershed comprises portions of San Bernardino, Riverside, Los Angeles, and Orange Counties, has an area of 2,840 square miles, and is home to over 6 million residents. The Santa Ana River is the major stream draining the watershed—96 miles in length from its headwaters near Big Bear to its discharge location in Huntington Beach. Figure 1 shows the upper portion of Santa Ana River Watershed, along with the Santa Ana River and its major tributaries. The figure also depicts the Santa Ana River GMZs within sub watersheds, and the total dissolved solids (TDS) and nitrate objectives associated with each GMZ that had sufficient data to make that determination. Locations of wastewater treatment plants (WWTPs) are shown in Figure 1.

2 The San Bernardino Basin Area (SBBA)

California Department Water Resources (DWR) Bulletin 118 delineates the following basins/subbasins in the Upper Santa Ana River Watershed: 8-2.03 Upper Santa Ana Valley – Riverside-Arlington; 8-2.04 Upper Santa Ana Valley – Rialto-Colton; 8-2.06 Upper Santa Ana Valley – Bunker Hill; 8-2.07 Upper Santa Ana Valley – Yucaipa. These subbasins are described in some detail in Bulletin 118 and are shown in Figure 1. The SBBA is an important supply of high-quality groundwater and is a critical component of the portfolios of several agencies overlying the SBBA or those that appropriate water from the SBBA per agreements. Total storage in the SBBA is almost 6 million acre feet and a safe field of 232,100 acre-feet per year.

3 Water Supply Strategies

Almost every groundwater resource agency in Southern California manages their water on a basin-wide scale in some form. In light of potential climate changes – prolonged droughts; decreases in frequency of precipitation events with an increased variability in intensity; and water demands from population increases – water supply agencies must act proactively to develop strategies to increase drought resilience, limit dependence on imported water, increase in stormwater capture and recharge, and increase the use of recycled water for landscape irrigation, and for recharge into groundwater basins.

FIGURE 1: UPPER SANTA ANA RIVER WATERSHED

WSC develops accurate, informative, and well designed maps for the reports we create, such as the one below. These maps effectively convey important information in way that is easy to understand and use.

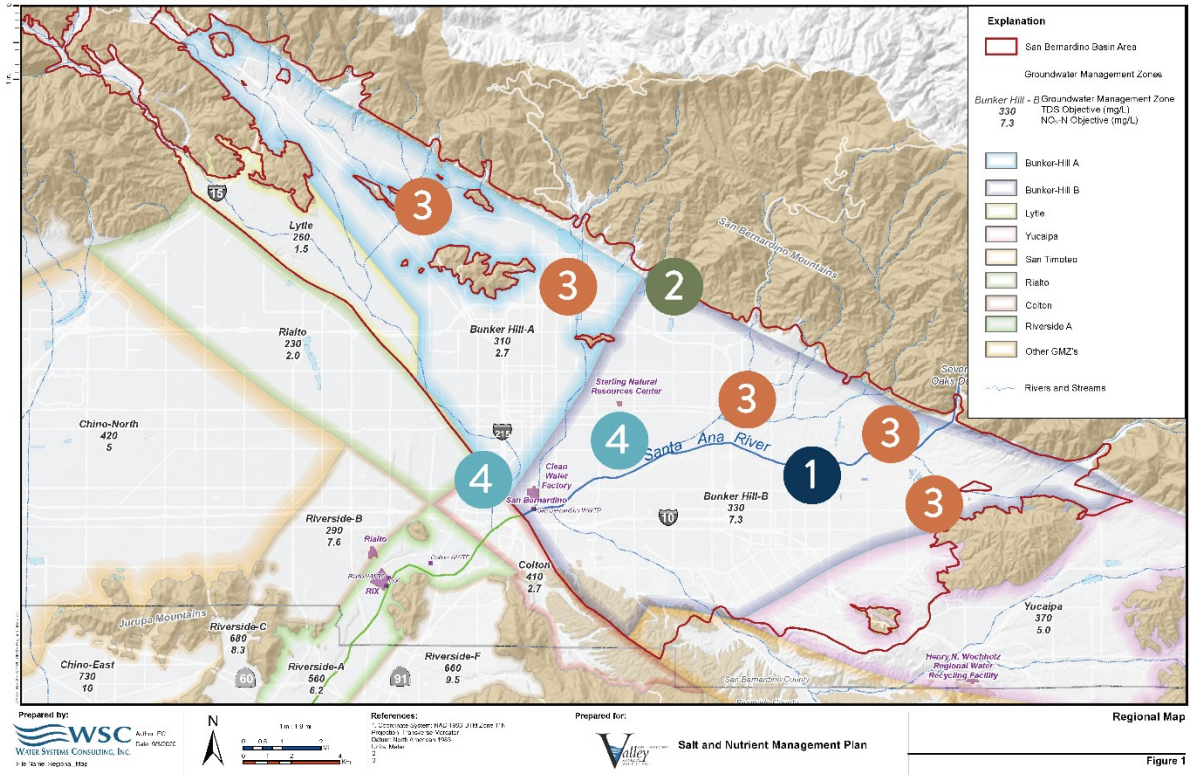


Figure 1

4 Recycled Water Policy

"The use of recycled water in California is part of an integrated water management approach that includes water conservation, capture and use of stormwater, aquifer storage and recovery, and other strategies to achieve a sustainable and reliable long-term water supply.[1]" Salt and nutrient management plans are required as part of the Recycled Water Policy (RWP) to streamline the potential for recycled water use; to understand potential impacts to groundwater quality; and to provide basin-wide management of salts and nutrients in groundwater.

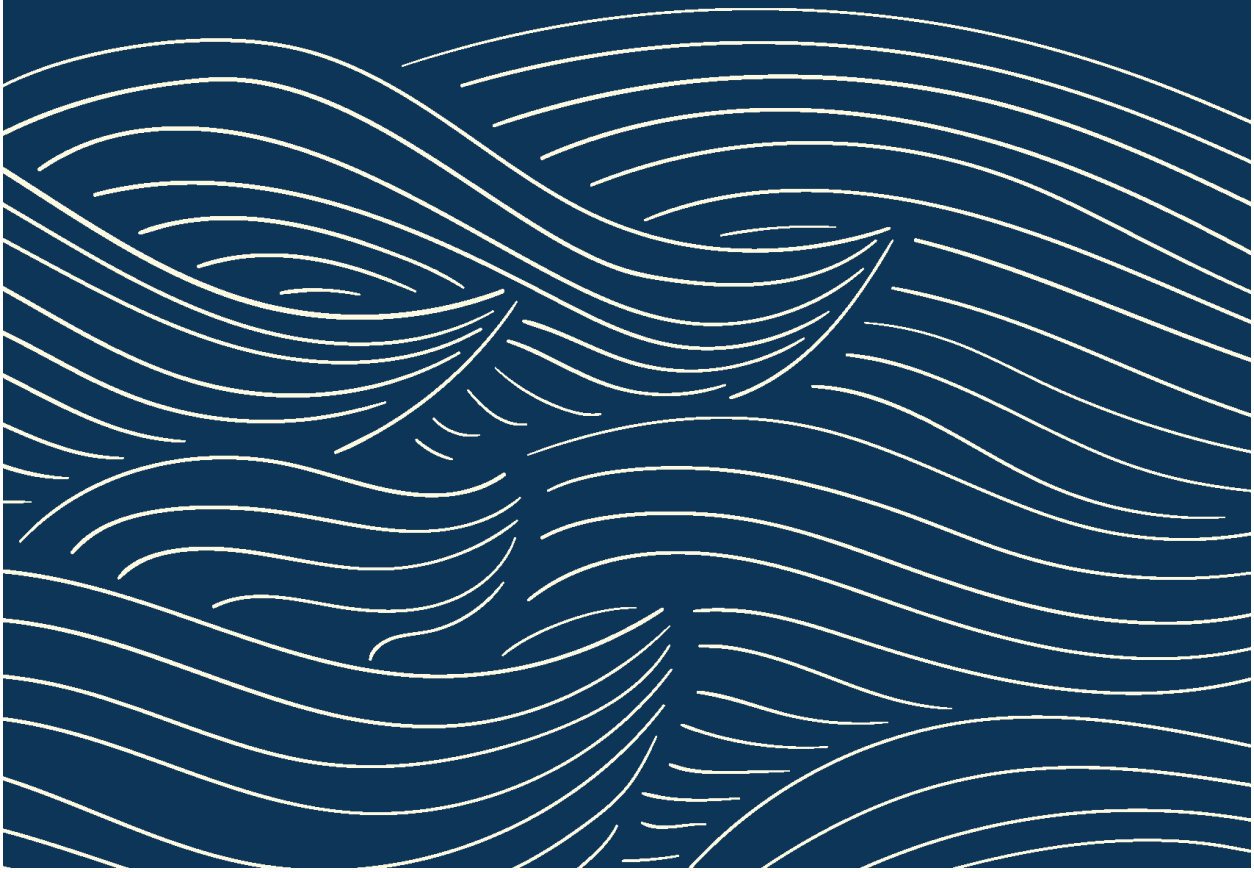
Salt and Nutrient Management Plans

Valley District, on behalf of the Upper Santa Ana River Watershed Stakeholders, is seeking an experienced water resource firm (or team of firms) to assist in the development of an SNMP for the SBBA. It is anticipated that the SNMP will provide the scientific framework necessary to gain regulatory support for objectively assessing the potential benefits and adverse effects on water quality.

[1] 2018 Recycled Water Policy Staff Report

[2] Salt and nutrient management planning is included in the Recycled Water Policy to help address the potential for recycled water use to impact groundwater quality and to promote basin-wide management of salts and nutrients in groundwater.

2 PROJECT APPROACH



PROJECT APPROACH

Expert Leadership & An Effective Approach

Our approach is designed to achieve stakeholder buy-in, Regional Board acceptance, and a get the project of to a fast start.

The WSC Team has the expertise to produce the technical information necessary to develop a Salt and Nutrient Management Plan for the SBBA. Our approach will create a quick start, stakeholder buy-in, and ultimately Regional Board Acceptance. These three pillars of our team's approach are summarized below and described in more detail within our proposal.

Our understanding is that the Valley District, and other stakeholders, would like to combine the following groundwater management zones (or portions of these GMZs) into a single SBBA groundwater management zone following Bulletin 118 basin boundaries. The thought process is that a larger SBBA GMZ would afford water resource managers more water management flexibility.

- Lytle GMZ
- Bunker Hill-A GMZ
- Bunker Hill-B GMZ
- A portion of the Yucaipa GMZ
- A portion of the San Timoteo GMZ

While not proposed to be included in the SBBA, the Rialto GMZ, the Colton GMZ and the Riverside-A GMZs will be included in the evaluation and analyses.

WSC's Approach Will Achieve:

A Quick Start

Our recent participation and leadership in the underlying technical work that will be used in Phases 1 and 2 of this project enables our team to immediately begin providing value to the Valley District and its stakeholders. WSC's team members have worked together on many projects in the past decade and are able to effectively collaborate and deliver.

Stakeholder Buy-In

Our approach considers the Valley District and its stakeholders' regional aspirations as well as their budget realities. We will draw upon our experience with each stakeholder — including our work with the Basin Monitoring Task Force — and our deep knowledge of the Santa Ana River Watershed to lead a collaborative process.

Regional Board Acceptance

We have built strong relationships with the Regional Board through our work on critical projects within the region — such as the Ambient Water Quality Recomputation, Nitrogen Loss Coefficient studies, and others. We will facilitate the iterative process with the Regional Board that gives the project a high likelihood of being approved.

The Integrated Santa Ana River Model is Integral to the Development of the SNMP

WSC Team member, Geoscience Support Services (Geoscience) was previously tasked by Valley District with constructing a groundwater flow model for the Upper Santa Ana Valley Groundwater Basin by integrating existing groundwater and surface water models. This model, known as the Integrated SAR Model, shown in Figure 2, was used as a management tool to determine what factors contribute to reduced streamflow in the SAR and to evaluate potential effects from proposed projects on streamflow and groundwater levels across the basin, including Upper SAR Habitat Conservation Plan (HCP) "Covered Activities". The flow model has been completed, and we are currently in the process of adding a solute transport model to simulate TDS and nitrate fate and transport.

The development of the SNMP includes compiling and analyzing historical observed storm water and imported water recharge data from 1978 through 2019. Since the Integrated SAR Model was calibrated monthly from January 1966 through December 2016, Geoscience has already obtained and is familiar with most of the required data. In addition, some of the projects from the SNMP project list have been included in the existing Model during our previous modeling efforts (e.g., simulation of HCP activities). These will allow us to execute the data analysis tasks efficiently.

Our Team proposes to utilize the Integrated SAR Model in Phase 2 of the SNMP development to:

- Estimate the probable effects of various planned recharge projects on ambient groundwater quality
- Evaluate localized water quality impacts on any drinking water supply wells and any potential effects on an affected agencies' ability to maintain compliance with the effluent limitations in their own discharge permits.
- Identify the advantages or disadvantages of potentially merging portions of all or some of the 8 GMZs (i.e., Bunker Hill-A, Bunker Hill-B, Lytle, Colton, Rialto, San Timoteo, Yucaipa, and Riverside-A) into a large single GMZ with boundaries that match those that DWR has established for the SBBA.

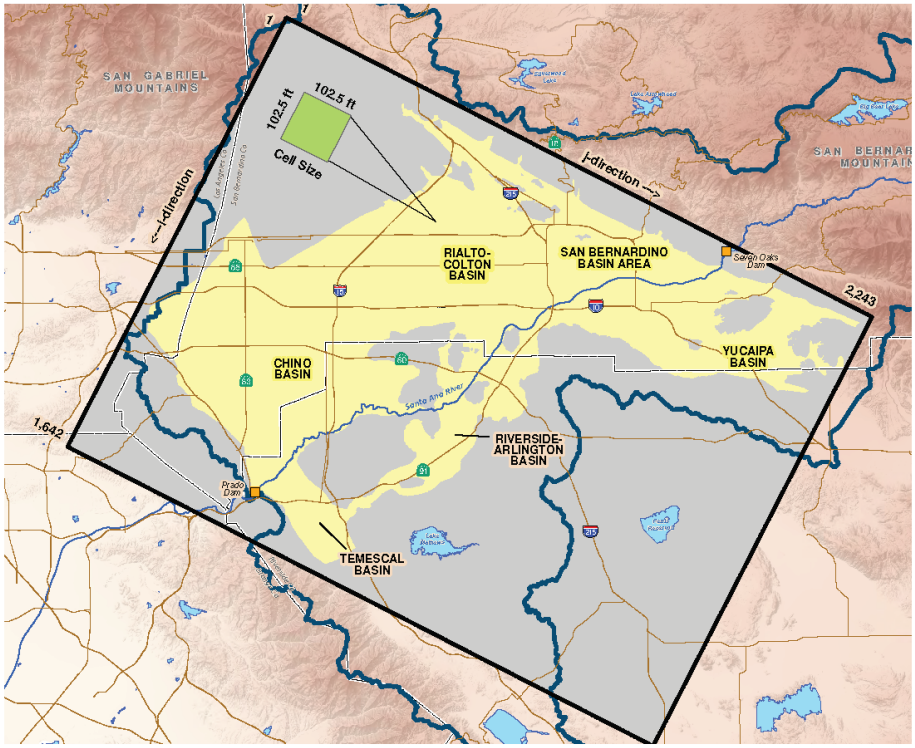


FIGURE 2: Integrated SAR Model Domain

Geoscience developed the Integrated SAR Model to be a management tool that can be used for projects like the Upper SAR HCP and the SNMP.

The Project Will Be Delivered in Three Phases

PHASE 1

The Phase 1 project approach will be to combine GMZs or portions of GMZs discussed above into a single GMZ. The estimate of current ambient water quality and ambient water quality in the historical or objective-setting period would be accomplished using the same methodology used in the original Phase 2A Total Inorganic Nitrogen/Total Dissolved Solids Study Task Order 1998-W-020 -1616-03.

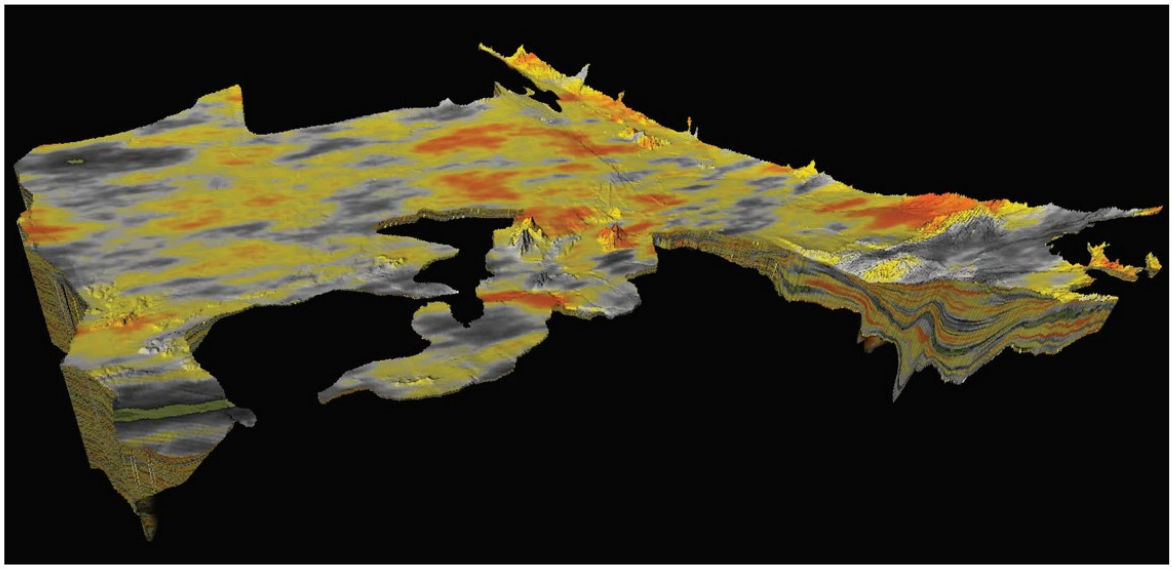
As noted above, the objective of this project is to determine if the combined SBBA would result in added regulatory options for increasing groundwater in storage through water reuse and stormwater capture projects.

PHASE 2

Geoscience has developed an integrated groundwater surface water model, the Integrated SAR Model, designed to evaluate projects in the region. Currently, Geoscience is adding a solute transport model which will be used to evaluate the water quality impacts to the underlying groundwater basins described in this RFP. This intimate knowledge of the model will allow our team to efficiently evaluate the projects identified during Phase 2.

FIGURE 2: INTEGRATED WATER QUALITY MODEL

As part of the model development, Geoscience developed a state of the art 3D lithogic model to accurately represent the complex geology of the Upper Santa Ana Watershed groundwater basins.



PHASE 3

Phase 3 will involve the development of a draft and final SNMP that, after review and concurrence from the stakeholders, will be submitted to the Regional Board for consideration of adoption. The components a state-approved SNMP must be included in the document submitted to the Regional Board including a programmatic California Environmental Quality Act (CEQA) review, a detailed description of the proposed projects, a surveillance and monitoring program, and any salt offsets or other mitigation commitments.

Scope of Work

TASK 0: PROJECT ADMINISTRATION

Our proposed Project Manager (PM), Michael Cruikshank, will be the point-of-contact for any work executed under this contract. The PM will be responsible for all project management services for the study including resource allocation and scheduling, cost controls, monthly invoice preparation and review, and the preparation of monthly status reports, including any anticipated changes to the schedule or budget. The PM will be solely responsible for the technical execution of the project, the quality of all deliverables, and the adherence to schedule and budget.

Task 0. Deliverables

- Monthly Invoices and Status Reports
- Updated Project Schedule
- Powerpoint Presentations

Phase 1: Water Quality Characterization

TASK 1: DEVELOP PROVISIONAL WATER QUALITY OBJECTIVES FOR THE SBBA GMZ

This project is intended to determine if merging certain GMZs into a single GMZ (the SBBA) and using the boundaries established in DWR Bulletin 118 would provide greater flexibility in managing the water resources in the SBBA and expanding the range of regulatory options. The RWP allows for the streamlining of permitting certain projects that will put more high quality in the basin through stormwater capture and the planned recharge of recycled water. Increasing groundwater storage in the SBBA will provide more resiliency and help to drought proof this portion of the watershed.

In order to make valid comparisons of current (1999 through 2018) ambient water quality (TDS and nitrate) with water quality in the historical or objective-setting period, a redetermination of water quality in the 1954 to 1973 period will be required, along with the current ambient water quality for the SBBA. The WSC team will use the new SBBA basin boundaries to delimit the project area. All of the requisite data should have been submitted to Santa Ana Watershed Project Authority (SAWPA) as part of the deliverables for each recomputation. The recomputation will use the rigorous methods and procedures developed in the Basin Monitoring Program Task Force and the Basin Plan. Note that all of the work to develop the water quality concentrations, groundwater levels and aquifer properties for the centroid of each 400 meter by 400-meter grid will be used verbatim in this project. The "raw" contours will be carefully examined to determine if any of the internal GMZs had contours depicting groundwater elevation, TDS concentrations or nitrate concentrations that were truncated at the internal GMZ boundaries. In cases where that is an issue, the WSC team will bring the required maps to the appropriate stakeholder meeting to discuss the implications of potentially recontouring.

Task 1.1: Data Inventory and Evaluation of Historical Data

WSC recently completed the 1999 – 2018 Ambient Water Quality Recomputation and is familiar with the datasets that have been developed over the past two decades. WSC reviewed the historical data included in the RFP and have identified the following steps to confirm and organize the datasets to complete Tasks 1-4:

- Take Inventory on all available data and identify which datasets will need to be converted from an old ESRI format
- Convert old ESRI format datasets to modern ESRI format datasets
- Organize data for Task 1.2, Task 1.3, and Task 2 to streamline workflow for each task

Before proceeding to Task 1.2, the WSC Team will prepare a proof of concept calculation using the 2018 AWQ data to determine the ambient water quality for both TDS and Nitrate for a combined Bunker-Hill A and B Management Zones. The determination is expected to show lower concentrations than if separated and most likely will be representative of the objective-setting period. Task 1.2 will perform the calculation over the SBBA boundary area for the objective setting period.

Task 1.2: Create Grid Extracts for SBBA GMZ from Historical Data

An initial review of the historical data revealed that the some of the data required to complete the Tasks is missing. Specifically, the grid extract data and TDS, Nitrate, and water level rasters from the 1954–1973 AWQ are missing. The Stakeholders should request this information from the Basin Monitoring Program Task Force. If the data request is unsuccessful, the data used to generate these files is included in the data set and can be used to generate the rasters and grid extract files from the historical data for the SBBA. For the purpose of this proposal, we have assumed that we would generate the information required to create the grid extract files and associated ambient water quality calculations.

The WSC Team will also incorporate the updated aquifer geometry and specific yield used in the Integrated Model in to the new SBBA GMZ grid extract data.

Task 1.3: Estimate Ambient Water Quality for 1954 to 1973 for the SBBA GMZ

The updated grid that will be created in Task 1.2 will be used to estimate the ambient water quality for the 1954 to 1973 time period for the volume-weighted TDS and Nitrate using the methods and procedures specified in the Basin Plan for the SBBA GMZ area.

Task 1. Deliverables

- Requisite tables, figures, maps, ArcGIS files/geodatabase
- Letter memorandum describing the work accomplished and the technical assessment of the work

TASK 2: ESTIMATE AMBIENT WATER QUALITY IN THE SBBA GMZ

Using the same methodology as in Task 1, 1954 to 1973: historical or the objective-setting period, the WSC team will conduct an analysis of TDS and nitrate ambient water quality for each of the assessment periods, listed below for the new SBBA GMZ:

- 1990 to 2009
- 1993 to 2012
- 1996 to 2015
- 1999 to 2018

The calculations must be performed using the same data, assumptions, contour map and grid cells that were previously accepted and approved by the Regional Board. Note that the historical TDS and Nitrate concentrations have already been computed and reported for each of the individual GMZs by the Basin Monitoring Program Task Force. This task is intended to perform similar computations for the larger SBBA GMZ (by merging portions of all or some of the small GMZs in the existing Basin Plan).

Task 2. Deliverables

- Requisite tables, figures, maps, ArcGIS files/ geodatabase
- Powerpoint presentation

TASK 3: EVALUATE TRENDS IN WATER QUALITY AND QUANTIFY AVAILABLE ASSIMILATIVE CAPACITY

WSC will develop estimates of assimilative capacity in the SBBA GMZ by comparing the water quality objective with the computed current water quality for each of the periods outlined in Task 2. This is similar to work accomplished in the 2018 Ambient Water Quality Recomputation by WSC.

WSC will create time-series charts for current ambient TDS concentrations, current ambient nitrate concentrations, and groundwater in storage. We will also look up projected long-term trends in the data.

Task 3. Deliverables

- Requisite tables, figures, maps, MS Excel files
- Powerpoint presentation

TASK 4: IDENTIFY POTENTIAL AREAS OF SIGNIFICANT WATER QUALITY IMPAIRMENT FOR TDS & NITRATE

WSC will review the most recent 20-year assessment period (1999-2018) and will identify grid cells or drinking water supply wells that are close to or are exceeding thresholds shown in the table below:

Where Nitrate Concentrations:	Where TDS Concentrations:
exceed 10 mg/L	exceed or threaten to exceed 1,000
exceed 8 mg/L, but are less than 10 mg/L	exceed 750 mg/L, but are less than 1,000 mg/L
exceed 5 mg/L, but are less than 8 mg/L.	exceed 500 mg/L, but are less than 750 mg/L

WSC will prepare a draft technical memorandum that summarizes the methods and results from Tasks 1 through 4. The technical memorandum will include all of the necessary tables, graphs and maps to document Tasks 1 through 4. The stakeholder group will provide comments during a 14-day period after submission of the draft technical memorandum. During the comment period, the WSC team will be available for any questions or clarifications. Once the comments have been received, they will be compiled into a table, along with the response of the WSC team – this table will be included in the final technical memorandum as an appendix.

Task 4. Deliverables

- Requisite tables, figures, maps, Microsoft Excel files
- Technical memorandum describing the work accomplished and the technical assessment of the work for Tasks 1-4.

TASK 5: DEVELOP SITE-SPECIFIC NITROGEN-LOSS COEFFICIENTS FOR THE SBBA

Water resource agencies in the Santa Ana watershed signed an Agreement to form a Task Force to conduct a watershed total inorganic nitrogen (TIN)/TDS resources study: ***Monitoring Program for Nitrogen and Total Dissolved Solids in the Santa Ana River Watershed***. Task 1 of the Phase 2A Study (November 1998) authorized the Task Force to retain consultants to conduct the total inorganic nitrogen/TDS study task order: to develop surface water translator for meeting groundwater objectives account for nitrogen losses during percolation (Nitrogen-Loss Coefficient). It is well documented that losses of TIN occur through soil aquifer treatment (SAT) in anoxic systems. Much of the nitrogen loss occurs in the schmutzdecke, a naturally-developed biological layer formed on the surface of slow sand filters and recharge basins. The schmutzdecke is the layer that provides the majority of the water purification in potable water treatment.

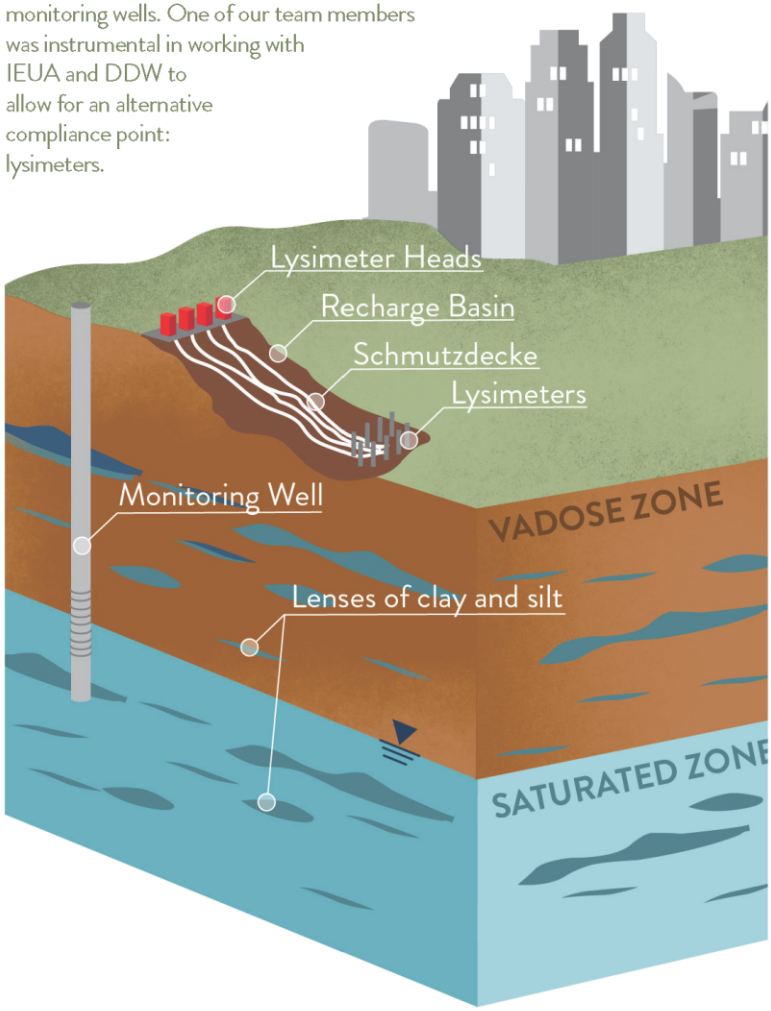
Four studies were proposed for the Phase 2A Nitrogen Loss Coefficient study: Anaheim Lake, Hidden Valley Wetlands Enhancement Program, Rapid Infiltration/Extraction (RIX); and the Redlands discharge ponds (deferred from, but the subsequent study was performed outside of the Task Force processes.) "The City of Riverside also presented data to the Task Force regarding nitrogen transformation and losses associated with wetlands. These data support a nitrogen loss coefficient of 50%, rather than 25%, for the lower portions of Reach 3 of the Santa Ana River that overlie the Chino South groundwater management zone. In fact, the data indicate that nitrogen losses from wetlands in this part of Reach 3 can be greater than 90%. However, given the limited database, the Task Force again recommended a conservative approach, i.e., 50% in this area, with confirmatory monitoring."

"Eastern Municipal Water District also presented data that support a 60% nitrogen loss coefficient in the San Jacinto Basin [Ref 10F]. This 60% nitrogen loss is only applicable to discharges to the following management zones that overlie the San Jacinto Basin: Perris North, Perris South, San Jacinto Lower Pressure, San Jacinto Upper Pressure, Lakeview-Hemet North, Menifee, Canyon and Hemet South."

IEUA has conducted N-Loss Studies in the Chino Basin Chino Basin Recycled Water Groundwater Recharge Program – About 10 basins with Alternate Monitoring Programs. Lysimeter testing/monitoring was first approved for use during the initial startup program and negotiations with Division of Drinking Water (DDW) participated in by one of the WSC team members, Joseph LeClaire. This team member is also currently working on the Declez Basin First Year Operations Report (FYOR) for IEUA and the current (2020) RIX N-Loss Study for the City of San Bernardino Municipal Water Department. The Redlands discharge basin report, written by a WSC team member, will be located and will satisfy the requirement for assessing N-Loss Coefficients at the Redlands Ponds.

FIGURE 3: MONITORING ESTIMATING NITROGEN LOSS COEFFICIENTS IN RECHARGE BASINS

Lysimeters are an innovative technique for sampling percolating recharge water in the vadose zone. Lysimeters are typically installed add at 5, 10, 15, 25 feet below the bottom of the recharge basin. There is a 100% certainty that the water that is being collected from the lysimeter is recharging water from the basins, with the exception of imported water and diverted stormwater. There is far less certainty when attempting to install a monitoring well in a groundwater mound somewhere near the vicinity of the recharge basin. Especially given the tortuous path of recycled water from the basin to the water table especially when the depth to water is a few to several 100 feet. In addition, the drilling and insulation of lysimeters is far less expensive than dedicated monitoring wells. One of our team members was instrumental in working with IEUA and DDW to allow for an alternative compliance point: lysimeters.



Following are potential sites from the RFP:

1. Reach 4 of the Santa Ana River below the RIX and Rialto outfalls
2. San Timoteo Creek below the Yucaipa Valley Water District and City of Beaumont outfalls
3. San Bernardino Water Conservation District's recharge basins adjacent to Reach 5 of the Santa Ana River The City of Redlands recharge basins adjacent to Reach 5 of the Santa Ana River
4. The streambed(s) downgradient of the Sterling Natural Resource Center's (SNRC) outfall and the losses expected to occur if the SNRC effluent were discharged to Redlands existing percolation ponds
5. Reach 3 of the Santa Ana River below the 60 Freeway

The WSC team will determine the efficacy of estimating N-Loss Coefficient given various site conditions at the proposed study sites, including proximity to a source of recycled water, historical and current monitoring programs (RIX is using existing data as a surrogate for nitrogen losses in the River); and concerns about vandalism/site security.

Task 5. Deliverables

- Workplan
- Requisite tables, figures, maps, Microsoft Excel files
- Powerpoint presentation

Task 5.1 Develop a Workplan for Approval by Regional Board

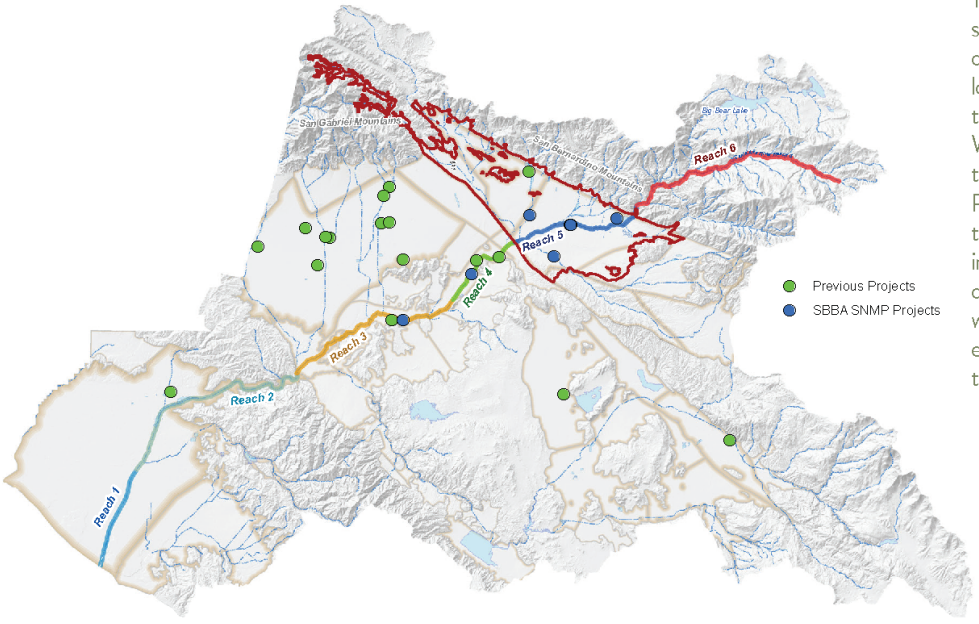
In Task 5.1; the WSC team will develop a work plan that describes the unique conditions at each of the proposed sites and answers the following questions: (i) Can existing data be used for any of the proposed sites? (ii) Similar to IEUA and RIX? (iii) Can existing reports be cited?

Studies of the estimation of N-Loss will follow the priorities:

- The availability of existing reports.
- The availability of existing data.
- Current monitoring program: collection of samples from the study areas (currently, no recycled water recharge program).
- No current monitoring program: collection of samples from the study areas (currently, recycled water recharge program).

The work plan will include a cost estimate and a schedule. The workplan would be proposed to be implemented in parallel with Phase 2. Task 5 does not include any field studies to collect nitrogen loss data in this phase. The data collection phase will occur after the workplan has been approved by the stakeholders and the Regional Board.

FIGURE 4: Location of Previous Nitrogen Loss Studies Completed in the Santa Ana Watershed



The map to the left shows the location of previous nitrogen loss studies within the Santa Ana River Watershed in relation to the Santa Ana River and SBBA and the projects identified in Task 5. Members of the WSC Team were involved in the evaluation in many of the previous studies.

Phase 2: Project Planning and Impact Analysis

TASK 6: SUMMARIZE THE VOLUME AND QUALITY OF IMPORTED WATER RECHARGED IN THE SBBA

As discussed previously, one of the WSC team members, Geoscience, has developed the Integrated SAR Model for the stakeholders in the upper portion of the Santa Ana River Watershed. The model domain covers the study area in its entirety, as well as groundwater basins downgradient of the SBBA Area. Metropolitan Water District has tables that provide monthly information on the general mineral and physical analysis of Metropolitan's water supplies (Table D)[3]. Metropolitan's Table D includes water quality data for source waters[4], and treatment plant effluents[5].

Based on Table D data, the WSC team will estimate the volume-weighted annualized average concentrations for TDS and nitrate for the period 1978 through 2019. These calculations will be associated with the appropriate source water or water treatment plant effluent. Volume-weighted TDS and nitrate will also be calculated as the moving 5-year, 10-year, and 20-year averages. Electronic data will be provided in an appendix. All requisite tables and figures (map data and time-series data) will be prepared.

The volume-weighted average concentrations of TDS and nitrate will be compared to the eight GMZs as well as the redefined SBBA GMZ – both the current ambient water quality and the historical or the objective setting period. An estimate of the change (more or less than) in computed assimilative capacity will be developed. This is a proxy for future estimates of the effect of additional recharge of State Water Project water to the SBBA.

The final results from Task 6.0, along with the final results from Task 7.0, will be documented in Phase 2 Technical Memorandum No. 1, which is described in detail under Task 7.2.

Valley District receives State Water Project at the Devil Canyon and the Devil Canyon Spreading Grounds can be used to spread State Water Project and stormwater.

[3] Table D includes: Silica (mg/L), Calcium (mg/L), Magnesium (mg/L), Sodium (mg/L), Potassium (mg/L), Carbonate (mg/L), Bicarbonate (mg/L), Sulfate (mg/L), Chloride (mg/L), Nitrate (mg/L), Fluoride (mg/L), Total Dissolved Solids (mg/L), Total Hardness as CaCO3 (mg/L), Total Alkalinity as CaCO3 (mg/L), Free Carbon Dioxide (mg/L), pH Specific Conductance (µS/cm), Color (CU), Turbidity (NTU), Temperature (°C), Bromide (mg/L), Total Organic Carbon (mg/L), Saturation Index, and State Project Water (%).

[4] Lake Havasu , San Jacinto Tunnel , Lake Mathews , Castaic Lake , Silverwood Lake, Lake Perris , Diamond Valley Lake, Lake Skinner.

[5] Weymouth , Diemer, Jensen, Skinner, and Mills.

TASK 7: SUMMARIZE THE VOLUME AND QUALITY OF STORMWATER CAPTURED BY ACTIVE RECHARGE PROJECTS IN THE SBBA

Task 7.1 - Summarize the Volume and Quality of Stormwater Captured by Active Recharge Projects in the SBBA

Similar to the imported water recharge analysis conducted under Task 6.0, Task 7.0 includes compiling observed or model-simulated stormwater captured data for historical stormwater projects. The project team will (i) estimate the volume of water that is purposely diverted and recharged in stormwater recharge ponds; (iii) estimate the volume-weighted annualized average concentration of TDS and nitrate in captured stormwater from 1978 thru 2019; and (iv) calculate and graph the rolling 5-year, 10-year, and 20-year volume weighted average TDS and nitrate concentrations.

The WSC team will compare these estimates of volume-weighted averages to the applicable water quality objectives and the estimates of water quality objectives computed in Task 1. Task 6 and Task 7 will estimate the additional assimilative capacity due to the capture/import and recharge of higher quality water. This exercise is meant to quantify potential salt and nitrate offset credits. In addition, Task 6 may be changed to include an estimate of the increase in assimilative capacity in one or more of the GMZs adjacent or proximate to the SBBA.

Task 7.2 - Phase 2 Technical Memorandum No. 1 Projects in the SBBA

The final results from Task 6.0 and Task 7.1 will be summarized in Draft Phase 2 Technical Memorandum (TM) No. 1. An electronic copy (i.e., PDF) will be provided and presented to the Valley District and participating agencies for review and comment. Upon incorporation of any comments, the WSC Team will submit an electronic copy of the Final Phase 2 TM No. 1.

Task 6 and 7. Deliverables

- Draft Phase 2 TM No. 1 (PDF)
- Final Phase 2 TM No. 1 (PDF)

The Waterman and Twin Creek Spreading Grounds capture stormwater and recharge State Water Project to the Bunker Hill-A GMZ.

TASK 8: CHARACTERIZE PROBABLE IMPACTS TO GROUNDWATER QUALITY FROM RECYCLED WATER PROJECTS

Task 8.1 Stakeholder Workshop

A workshop is proposed at the start of Task 8 to confirm the current and planned recycled water projects (including recharge locations, recharge quantities, and recycled water qualities) to be included in the SNMP. Other major model assumptions for the predictive scenarios will also be discussed and confirmed during this workshop, including hydrology, imported water recharge, stormwater capture, and groundwater pumping. The WSC team will summarize the draft modeling assumptions prior to the workshop. Any comments received from this workshop will be incorporated into the Task 8.2 recycled water evaluation using groundwater model runs.

The WSC team will provide a detailed description of the potential projects that would be under consideration in the SNMP, including an estimate of the volume-weighted, annual average concentration of TDS and nitrate discharged into the SBBA GMZ or into the overlying surface waters. Example projects include the following:

1. East Valley Water District's Sterling Natural Resource Center
2. San Bernardino Water Department's Clean Water Factory
3. Yucaipa Valley Water District's discharge to San Timoteo Creek
4. City of Beaumont's discharge to tributaries of San Timoteo Creek
5. City of Riverside's planned discharges to Reach 3 of the Santa Ana River above MWD crossing (as part of the HCP implementation strategy).
6. Expanded application to landscape and agricultural irrigation.

A baseline scenario model run without any SNMP projects will be performed. Results from other predictive scenario runs for recycled water projects will be compared to the baseline scenario results to identify net changes of TDS and nitrate concentrations from planned recycled water projects, individually and collectively, over the next 20 years.

Upon the confirmation the scenario assumptions from Task 8.1, the WSC Team will run multiple scenario runs to identify volume-weighted annual average concentrations of TDS and nitrate after implementing planned recycled water projects. The scenario modeling results will be compared to baseline results to identify net changes on average TDS and nitrate concentrations in the receiving groundwater basins that expected to occur as a result of these planned recycled water recharge projects, individually and collectively, over the next 20 years.

Results from this modeling and analysis effort will include:

- Model-predicted TDS and nitrate concentrations through time with and without recycled water project(s)
- Volume-weighted annual average, rolling 5-year, 10-year, and 20-year average TDS and nitrate concentrations for the baseline run and each scenario run in the applicable GMZs and the larger SBBA GMZ
- Chemographs for TDS and nitrate at water supply wells showing recycled water project local impacts on downstream drinking water wells

It is assumed that two iterations of model runs will be performed; each iteration includes one baseline run and multiple scenario runs to evaluate the above-reference recycled water projects, individually and collectively. The first iteration of model runs will assume a 25% nitrogen loss coefficient. The second iteration of model runs will use the site-specific nitrogen loss coefficient identified from Phase 1 Task 5.0.

Task 8.3 - Phase 2 Technical Memorandum No. 2

Results from Task 8.1 and Task 8.2 will be summarized in Draft Phase 2 TM No. 2. An electronic copy (i.e., PDF) will be provided and presented to the Valley District and participating agencies for review and comment. Upon incorporation of any comments on the Draft Phase 2 TM No.2 and the results of the second iteration model runs, Geoscience will submit an electronic copy of the Final Phase 2 TM No. 2.

Task 8.0. Deliverables

- Draft Phase 2 TM No. 2 (PDF)
- Final Phase 2 TM No. 2 (PDF)

TASK 9: CHARACTERIZE THE PROBABLE CUMULATIVE AND COLLECTIVE IMPACTS TO GROUNDWATER QUALITY

Task 9.1 - Characterize the Probable Cumulative and Collective Impacts to Groundwater Quality

The WSC team will run a model scenario with all planned imported water (Task 6.0), stormwater (Task 7.0), and recycled water (Task 8.0) projects to estimate the probable cumulative and collective impacts to ambient groundwater qualities (i.e., net change on average TDS and nitrate concentrations compared to baseline results) in the applicable GMZs and the larger SBBA. This analysis will include the following results:

- Model-predicted TDS and nitrate concentrations through time with and without SNMP project(s);
- Volume-weighted annual average, rolling 5-year, 10-year, and 20-year average TDS and nitrate concentrations under all SNMP project conditions in the applicable GMZs and the larger SBBA GMZ; and
- Chemographs for TDS and nitrate at water supply wells showing SNMP projects local impacts on downstream drinking water wells.

It is assumed that two iterations of model runs will be performed under Task 9.0; each iteration includes one model run with all planned imported water, stormwater, and recycled water projects. The first iteration model run will assume a 25% nitrogen loss coefficient. The second iteration model run will use the site-specific nitrogen loss coefficient identified from Phase 1 Task 5.0.

The WSC team will evaluate the potential impacts on the ability of publicly owned treatment works (POTWs, which rely on the SBBA for water supply) to maintain consistent compliance with their current effluent limits for TDS, by providing supporting modeling input and output data.

Task 9.2 - Phase 2 Technical Memorandum No. 3

Results from Task 9.1 will be summarized in Draft Phase 2 TM No. 3. An electronic copy (i.e., PDF) will be provided and presented to the Valley District and participating agencies for review and comment. Upon incorporation of any comments, the WSC Team will submit an electronic copy of the Final Phase 2 TM No. 3.

Task 9.0. Deliverables

- Draft Phase 2 TM No. 3 (PDF)
- Final Phase 2 TM No. 3 (PDF)

TASK 10: CHARACTERIZE SOURCE LOADING FOR GROUNDWATERS IMPAIRED BY TDS OR NITRATE

In this task, WSC will identify and quantify the loads of TDS and nitrate to the GMZs. The Integrated SAR Model will estimate the impacts from various water supply sources including storm water, imported water, and recycled water. Best estimates of legacy loads from past discharges, that are moving through the vadose zone will be made. The Integrated SAR model will be used to bound the estimates of legacy loads.

TASK 11: PROJECT MEETINGS

The WSC team will coordinate meeting times with the Valley District PM and will host, participate, and attend the various meetings. Due to COVID-19 it is assumed that half of the meetings would be conducted virtually and half in person. This project is a stakeholder driven process and will require several types of meetings with a variety of stakeholders, durations and occurrences and are summarized in the table below:

TABLE 1. Meeting Schedule

	Kickoff	Staff/ Stakeholder	Working Sessions	Participating Agency	Public Meetings
Occurrence	1	Monthly (18)	Quarterly (6)	Quarterly (6)	2
Duration (hrs)	1	1.5	3	3	2
			# of Meetings		
WSC	1	18	6	6	2
Geoscience	1	12	3	3	1
LCA	1	12	3	3	1
W&C	1	6	2	2	1

OPTIONAL TASK: PHASE 3 SALT AND NUTRIENT MANAGEMENT PLAN

If the Stakeholders elect to proceed with the development of a SNMP, the WSC Team will prepare a proposal to develop a formal SNMP suitable for submission to the Regional Board. The WSC Team will develop an SNMP that leverages the substantial existing data and advanced modeling and analysis tools available for the SBBA. The SNMP approach will combine the technical effort with a deep understanding of current and proposed recharge projects and with a robust stakeholder outreach process. The input data to the Integrated SAR Model will be used to develop information on background conditions, the basin characterization, and potential sources of salt and nutrient loadings. This method takes advantage of previous work and knowledge within our team to efficiently evaluate the existing conditions and projected conditions and to identify associated salt and nutrient loadings. Further, usage of the existing data collected and analyzed for the modeling effort will maintain consistency between the modeling analysis performed and the SNMP process. Should additional information be learned during the SNMP process, the data will be considered for refinement within the model. The output from the Integrated SAR Model will be used to derive the estimates of Management Zone concentrations of salts and nutrients over time and to support point estimates of concentrations at specific locations, to evaluate local conditions such as downstream wells. By using the Integrated SAR Model platform, the SNMP findings will be consistent and will take advantage of the best available dataset to support the analysis.

Why Select WSC?

A Quick Start

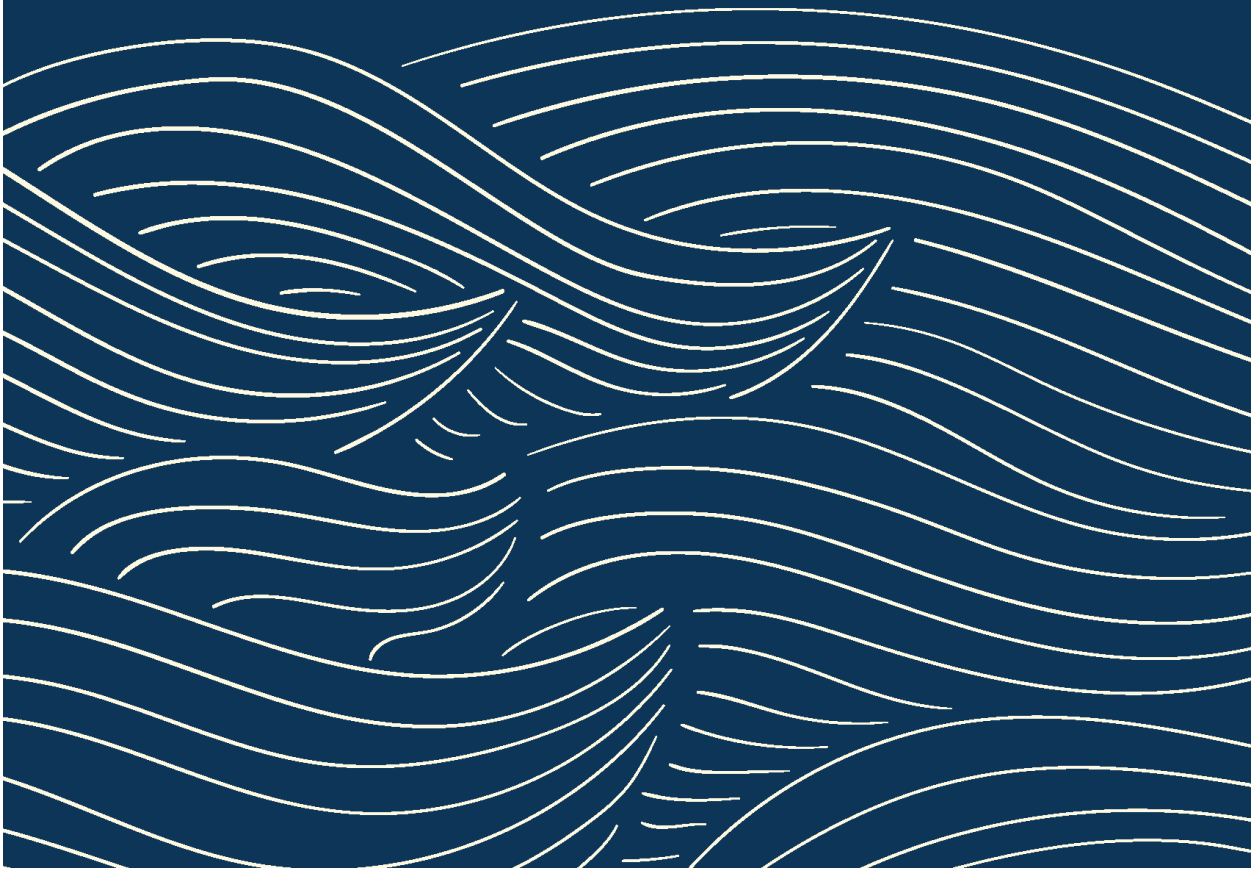
Stakeholder Buy-In

Regional Board Acceptance

WSC's team is committed to the success of the SBBA its stakeholders. We have worked hard to build strong relationships based on trust, to deliver value through the work that we do, and create a sustainable water future that benefits all the people living here.

Our team has a wealth of experience that we will draw upon for this project, enabling us to start fast and deliver immediate benefit to Valley District and the SBBA stakeholders. We will lead a collaborative process with the purpose of building buy-in from those who will be affect by the SNMP. We also have a proven history of successfully working with the Regional Board to gain their approval for critical water resources projects in the Santa Ana River Watershed.

3 ORGANIZATIONAL CHART



Organizational Chart

WSC's team has unparalleled knowledge of the Upper Santa Ana River Watershed groundwater basins and is organized to have the right people with the right experience leading each task so that Valley District can expect a high-quality and innovative SNMP.

Qualifications and resumes for all team members are included in Appendix A.

Principal In Charge
Jeff Szytel (3) PE, MS, MBA

PROJECT MANAGER
Michael Cruikshank (2) PG, CHG

Michael is a proven partner to Valley District on innovative, complex, and collaborative water resource projects and programs.

QA/QC
Rob Morrow (3) PE, MS

Groundwater Quality Characterization
Michael Cruikshank (2) PG, CHG
Joseph LeClaire (4) PHD
Erik Cadaret (2) GIT, MS

Nitrogen Loss Coefficent
Joseph LeClaire (4) PHD
Erik Cadaret (2) GIT, MS

Recharge Water Quality & Flow
Johnson Yeh (5) PHD, PG, CHG
David Barnes (5) MS

Project Evaluation
Laine Carlson (1) PE, T2 & D2 Water Op
Rob Morrow (3) PE, MS
Rosalyn Prickett (6) AICP, MS

Groundwater Modeling
Johnson Yeh (5) PHD, PG, CHG
David Barnes (5) MS
Lauren Wicks (5) PG, MS
Tim Chen (5) MS, EIT

Salt & Nutrient Management Plan
Joseph LeClaire (4) PHD
Michael Cruikshank (2) PG, CHG
James Blanke (6) PE, PG, CHG
Sevim Onsoy (6) PHD
Rosalyn Prickett (6) AICP, MS

	TEAM MEMBER	EMAIL
1	Laine Carlson	lcarlson@wsc-inc.com
2	Michael Cruikshank	mcruikshank@wsc-inc.com
2	Erik Cadaret	ecadaret@wsc-inc.com
3	Jeff Szytel	jszytel@wsc-inc.com
3	Rob Morrow	rmorrow@wsc-inc.com
4	Joseph LeClaire	joseph.leclaire@outlook.com
5	Johnson Yeh	jyeh@geoscience-water.com
5	David Barnes	dbarnes@geoscience-water.com
5	Lauren Wicks	lwicks@wsc-inc.com
5	Tim Chen	tchen@wsc-inc.com
6	James Blanke	jblanke@woodardcurran.com
7	Sevim Onsoy	sonsoy@woodardcurran.com
8	Rosalyn Prickett	rprickett@woodardcurran.com

OFFICE LOCATION, PHONE & FAX

1 WSC Inland Empire, CA
(909) 483-3200 | Fax (909) 354-3482
9375 Archibald Ave., Suite 200,
Rancho Cucamo, CA 91730

2 WSC Orange County, CA
(949) 528-0960 | Fax (909) 354-3482
23232 Peralta Drive, Suite 215,
Laguna Hills, CA 92653

3 WSC San Luis Obispo, CA
(805) 457-8833 | Fax (805) 888-2764
805 Aerovista Place, Suite 201,
San Luis Obispo CA 93401

4 L&A Costa Mesa, CA
(949) 616-0440 | Fax (N/A)
PO Box 11815, Costa Mesa, CA 92627

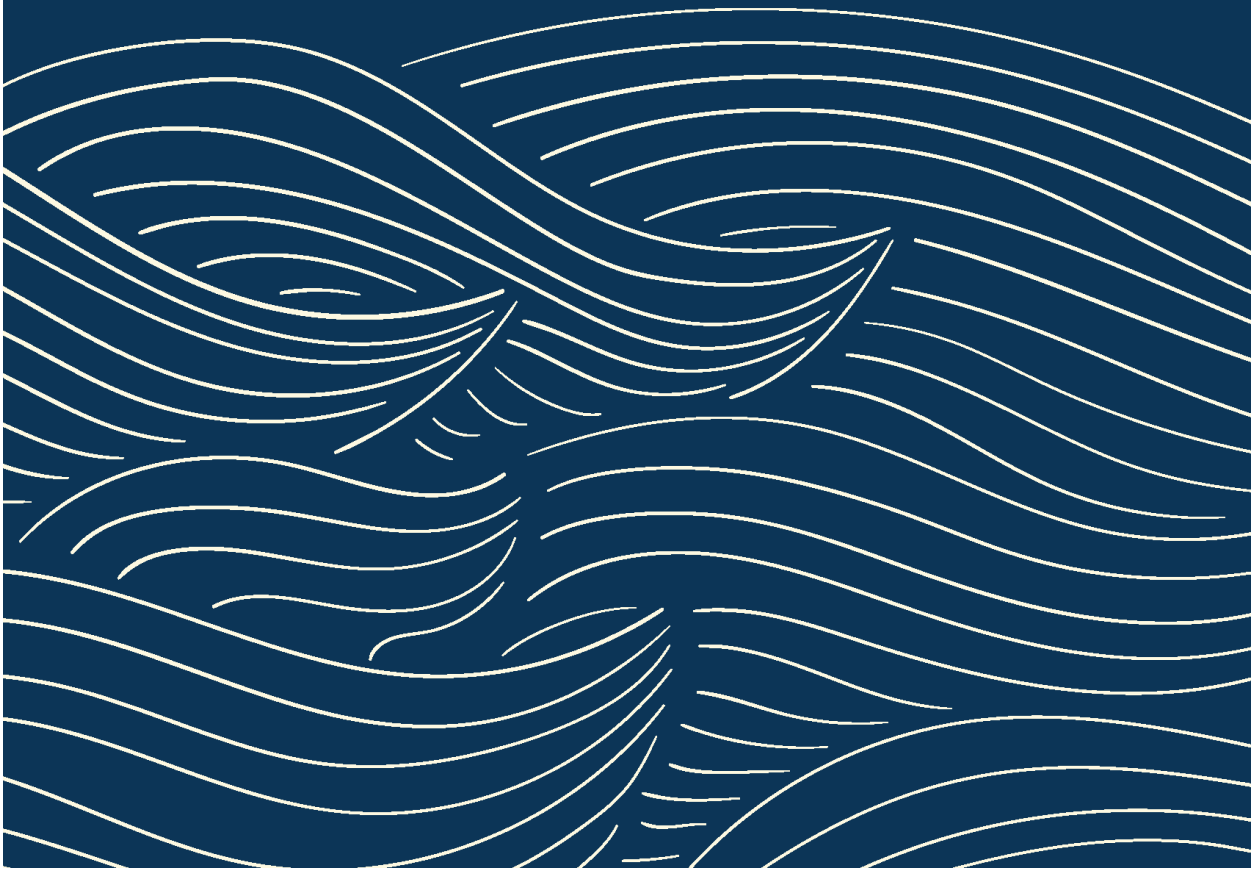
5 Geoscience Claremont, CA
(909) 451-6650 | Fax (N/A)
PO Box 220, Claremont, CA 901711

6 W&C Sacramento, CA
(916) 999-8700 | Fax (916) 999-8701
801 T Street, Sacramento, CA 95811

6 W&C Walnut Creek, CA
(925) 627-4100 | Fax (925) 627-4101
2175 N. California Boulevard, Suite 315,
Walnut Creek, CA 94596

6 Woodard and Curran San Diego, CA
(858) 875-7400 | Fax (858) 875-7401
9665 Chesapeake Drive, Suite 320,
San Diego, CA 92123

4 PROJECT SCHEDULE



Project Schedule

TASKS	2021											2022							
	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A
Project Meetings																			
Kickoff Meeting																			
Meetings with Staff/Stakeholders (Monthly - 18)																			
Working sessions (Assume quarterly -6)																			
Monthly progress meetings or conference calls - 20																			
Meetings with agencies participating in the SNMP Update (Assume quarterly - 6)																			
Any public meetings required by the process (Assume 2 meetings)																			
Phase 1: Water Quality Characterization																			
Task 1: Develop provisional water quality objectives for the SBBA GMZ																			
Task 2: Estimate ambient water quality in the SBBA GMZ																			
Task 3: Evaluate trends in water quality and quantify available assimilative capacity																			
Task 4: Identify potential areas of significant water quality impairment for TDS & Nitrate						TM													
Task 5: Develop site-specific nitrogen-loss coefficients for the SBBA																			
Workplan for approval by Regional Board								TM											
Fieldwork to support N-loss studies																			TM
Phase 2: Project Planning & Impact Analysis																			
Task 6: Summarize the volume and quality of imported water recharged in the SBBA																			
Task 7: Summarize the volume and quality of stormwater captured by active recharge projects in the SBBA											TM								
Task 8: Characterize probable impacts to groundwater quality from recycled water projects											TM				TM				
Task 9: Characterize the probable cumulative and collective impacts to groundwater quality														TM				TM	
Task 10: Characterize source loading for groundwaters impaired by TDS or nitrate.														TM				TM	

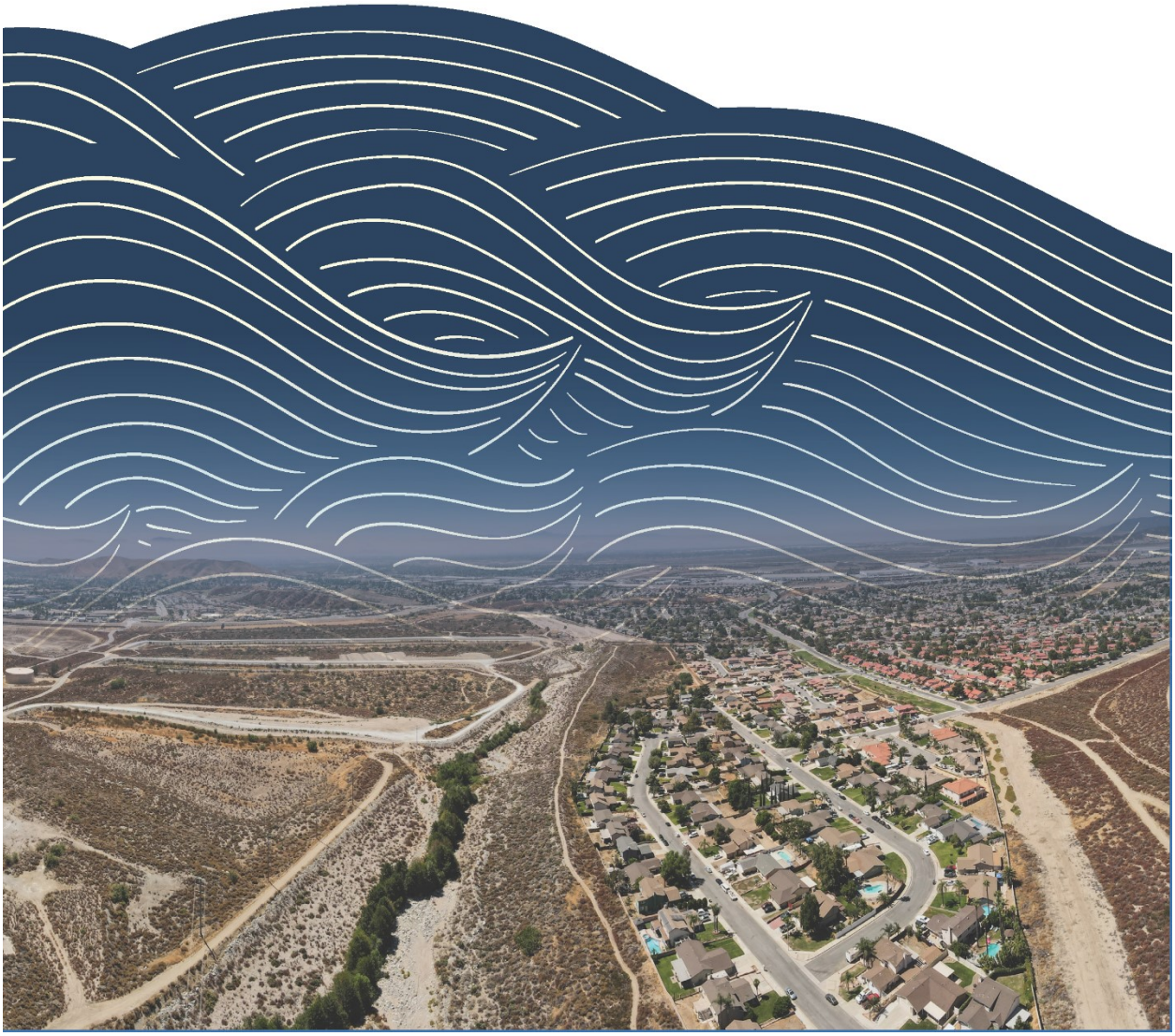

6
FEE SCHEDULE

FEE SCHEDULE

Task No.	Task Description	WSC								Woodard & Curran		Geoscience		LeClaire Associates		ALL FIRMS			
		QA/QC	PIC	Project Manager	QA/QC	Staff Hydrogeologist	Staff Engineer	Administration	WSC Labor Fee	Labor Hours	Labor Fee	Labor Hours	Labor Fee	Labor Hours	Labor Fee	Total Labor Hours	Total Labor Fee	Expenses	Total Fee
		Jeffery Szytel	Laine Carlson	Michael Cruikshank	Robert Morrow	Erik Cadaret	Aaron Morland	Kay Morrill											
	Billing rates, $/hr	*$305*	*$250*	*$240*	*$250*	*$165*	*$145*	*$145*			*$228*		*$225*		*$180*				
0	**Project Management**																		
0.1	Project Administration		6	60				16	$ 18,220			44	$ 11,766	10	$ 1,980	136	$ 31,966	$ 400	$ 32,366
0.5	Monthly Project Conference Calls		4	20					$ 5,800					12	$ 2,376	36	$ 8,176	$ 100	$ 8,276
0.7	QA/QC	8	24		8				$ 10,440							40	$ 10,440	$ 200	$ 10,640
	SUBTOTAL	**8**	**34**	**80**	**8**	**0**	**0**	**16**	$ 34,460	**0**	$ -	**44**	$ 11,766	**22**	$ 4,356	**212**	$ 50,582	$ 700	$ 51,282
1	**Develop provisional water quality objectives for the SBBA GMZ**																		
1.1	Data Inventory and Evaluation of Historical Data			6		20	12		$ 6,480					4	$ 792	42	$ 7,272	$ 100	$ 7,372
1.2	Create Grid Extracts for SBBA GMZ from Historical Data			6		32	12		$ 8,460					4	$ 792	54	$ 9,252	$ 200	$ 9,452
1.3	Estimate AWQ for 1954 to 1973 for the SBBA GMZ			6		16	8		$ 5,240					8	$ 1,584	38	$ 6,824	$ 100	$ 6,924
	SUBTOTAL	**0**	**0**	**18**	**0**	**68**	**32**	**0**	$ 20,180	**0**	$ -	**0**	$ -	**16**	$ 3,168	**134**	$ 23,348	$ 400	$ 23,748
2	**Estimate ambient water quality in the SBBA GMZ**																		
2.1	Estimate AWQ for previous computations			3		30	20		$ 8,570					4	$ 792	57	$ 9,362	$ 200	$ 9,562
	SUBTOTAL	**0**	**0**	**3**	**0**	**30**	**20**	**0**	$ 8,570	**0**	$ -	**0**	$ -	**4**	$ 792	**57**	$ 9,362	$ 200	$ 9,562
3	**Evaluate trends in water quality and quantify available assimilative capacity**																		
3.1	Develop trend charts for AWQ and groundwater in storage			6		16	8		$ 5,240					8	$ 1,584	38	$ 6,824	$ 100	$ 6,924
	SUBTOTAL	**0**	**0**	**6**	**0**	**16**	**8**	**0**	$ 5,240	**0**	$ -	**0**	$ -	**8**	$ 1,584	**38**	$ 6,824	$ 100	$ 6,924
4	**Identify potential areas of significant water quality impairment for TDS & Nitrate**																		
4.1	Develop maps that identify significant water quality impairments			6		80	40		$ 20,440					8	$ 1,584	134	$ 22,024	$ 400	$ 22,424
4.2	Prepare Technical Memorandum for Tasks 1-4			8		40	20		$ 11,420					24	$ 4,752	92	$ 16,172	$ 200	$ 16,372
	SUBTOTAL	**0**	**0**	**14**	**0**	**120**	**60**	**0**	$ 31,860	**0**	$ -	**0**	$ -	**32**	$ 6,336	**226**	$ 38,196	$ 600	$ 38,796
5	**Develop site-specific nitrogen-loss coefficients for the SBBA**																		
5.1	Develop a Workplan for approval by Regional Board		4	24		120			$ 26,560					140	$ 27,720	288	$ 54,280	$ 500	$ 54,780
	SUBTOTAL	**0**	**4**	**24**	**0**	**120**	**0**	**0**	$ 26,560	**0**	$ -	**0**	$ -	**140**	$ 27,720	**288**	$ 54,280	$ 500	$ 54,780
6	**Summarize the volume and quality of imported water recharged in the SBBA**																		
6.1	Summarize the volume and quality of imported water recharged in the SBBA			8					$ 1,920	18	$ 5,511	22	$ 5,452	4	$ 792	52	$ 13,675	$ -	$ 13,675
	SUBTOTAL	**0**	**0**	**8**	**0**	**0**	**0**	**0**	$ 1,920	**18**	$ 5,511	**22**	$ 5,452	**4**	$ 792	**52**	$ 13,675	$ -	$ 13,675
7	**Summarize the volume and quality of stormwater captured by active recharge projects in the SBBA**																		
7.1	Summarize the volume and quality of stormwater captured by active recharge projects in the SBBA			8					$ 1,920	14	$ 4,310	22	$ 5,452	4	$ 792	48	$ 12,473	$ -	$ 12,473
7.2	Phase 2 TM No.1			8					$ 1,920			37	$ 7,715	2	$ 396	47	$ 10,031	$ -	$ 10,031
	SUBTOTAL	**0**	**0**	**16**	**0**	**0**	**0**	**0**	$ 3,840	**14**	$ 4,310	**59**	$ 13,167	**6**	$ 1,188	**95**	$ 22,505	$ -	$ 22,505
8	**Characterize probable impacts to groundwater quality from recycled water projects**																		
8.1	Stakeholder Workshop			8					$ 1,920			26	$ 6,323	4	$ 792	38	$ 9,035	$ -	$ 9,035
8.2	Evaluate Recycled Water Project Impacts			40					$ 9,600	20	$ 6,217	216	$ 55,361	8	$ 1,584	284	$ 72,762	$ 200	$ 72,962
8.3	Phase 2 TM No.2			8					$ 1,920			58	$ 12,404	2	$ 396	68	$ 14,720	$ -	$ 14,720
	SUBTOTAL	**0**	**0**	**56**	**0**	**0**	**0**	**0**	$ 13,440	**20**	$ 6,217	**300**	$ 74,087	**14**	$ 2,772	**390**	$ 96,516	$ 200	$ 96,716
9	**Characterize the probable cumulative and collective impacts to groundwater quality**																		
9.1	Characterize the Probable Cumulative and Collective Impacts to Groundwater Quality			8					$ 1,920	24	$ 7,383	44	$ 11,013	16	$ 3,168	92	$ 23,484	$ -	$ 23,484
9.2	Phase 2 TM No.3			8					$ 1,920			54	$ 11,761	2	$ 396	64	$ 14,077	$ -	$ 14,077
	SUBTOTAL	**0**	**0**	**16**	**0**	**0**	**0**	**0**	$ 3,840	**24**	$ 7,383	**98**	$ 22,774	**18**	$ 3,564	**156**	$ 37,562	$ -	$ 37,562
10	**Characterize source loading for groundwaters impaired by TDS or nitrate.**																		
10.1	Characterize Source Loading for Groundwater impaired by TDS and Nitrate			12		40			$ 9,480			20	$ 4,950	40	$ 7,920	112	$ 22,350	$ 200	$ 22,550
	SUBTOTAL	**0**	**0**	**12**	**0**	**40**	**0**	**0**	$ 9,480	**0**	$ -	**20**	$ 4,950	**40**	$ 7,920	**112**	$ 22,350	$ 200	$ 22,550
11	**Project Meetings**																		
11.1	Kickoff Meeting	4	4	4					$ 3,180					2	$ 396	14	$ 3,576	$ 100	$ 3,676
11.2	Working Sessions (Quarterly - 6 meetings)		20	30		24			$ 16,160	12	$ 3,674	39	$ 11,391	12	$ 2,376	137	$ 33,601	$ 300	$ 33,901
11.3	Public Meetings (Assumes 2 meetings)		4	8					$ 2,920							12	$ 2,920	$ 100	$ 3,020
11.4	Meetings with Staff/Stakeholders (Monthly-18 meetings)		12	40		24			$ 16,560			39	$ 11,391	18	$ 3,564	133	$ 31,515	$ 300	$ 31,815
	SUBTOTAL	**4**	**40**	**82**	**0**	**48**	**0**	**0**	$ 38,820	**12**	$ 3,674	**78**	$ 22,781	**32**	$ 6,336	**296**	$ 71,611	$ 800	$ 72,411
	Contingency																		
	Contingency			3		90	40		$ 21,370					4	$ 792	137	$ 22,162	$ 400	$ 22,562
	SUBTOTAL	**0**	**0**	**3**	**0**	**90**	**40**	**0**	$ 21,370	**0**	$ -	**0**	$ -	**4**	$ 792	**137**	$ 22,162	$ 400	$ 22,562
	COLUMN TOTALS	**12**	**78**	**338**	**8**	**532**	**160**	**16**	$ 219,580	**88**	$ 27,095	**621**	$ 154,977	**340**	$ 67,320	**2,193**	$ 468,972	$ 4,100	$ 473,072

10% mark-up on direct expenses; 10% mark-up for sub-contracted services
Subconsultant average hourly rate is shown in the fee table.
Standard mileage rate $0.57 per mile (or current Federal Mileage Reimbursement Rate)
Airplane mileage rate $1.27 per mile (or current Federal Airplane Mileage Reimbursement Rate)
Rates are subject to revision as of January 1 each year.

expectWSC.com



Yucaipa Valley Water District

Director Memorandum 21-033

Date: February 23, 2021

Prepared By: Dustin Hochreiter, Senior Engineering Technician

Subject: Consideration of Development Agreement No. 2021-01 for a Sewer Service at 32690 Yucaipa Boulevard, Yucaipa (Assessor Parcel Number 0299-321-84)

Recommendation: That the Board authorizes the Board President to execute Development Agreement No. 2021-01.

The District staff has prepared the attached development agreement for sewer service to the Dutch Bros. Coffee shop located at 32690 Yucaipa Boulevard between 13th Street and Sand Canyon Road / 14th Street, in the City of Yucaipa.

Yucaipa Valley Water District will provide sewer service and Western Heights Mutual Water Company will provide drinking water service. Recycled water is not available at this location.

AGREEMENT TO PROVIDE SEWER SERVICE TO 32690 Yucaipa Boulevard, APN: 0299-321-84 IN THE CITY OF YUCAIPA, COUNTY OF SAN BERNARDINO

This Agreement is made and effective this 23rd day of February 2021, by and between the Yucaipa Valley Water District, a public agency ("District"), and a CVP - Yucaipa DB, LLC, California limited liability company ("Developer"). Each is sometimes referred to herein as a "Party" and jointly as the "Parties".

Elements Project Service Order No.
17932

For contractual issues, the Parties are represented by the following responsible individuals authorized to execute this Agreement:

District	Developer
Yucaipa Valley Water District	CVP - Yucaipa DB, LLC,
12770 Second Street	a California limited liability company
Post Office Box 730	3519 NE 15th Ave, Suite 251
Yucaipa, California 92399	Portland, OR 97212
Attention: Joseph Zoba, General Manager	Attention: Mitchell Reynolds
Telephone: (909) 797-5119 x 2	Telephone: (918) 934-0288
E-mail: jzoba@yvwd.us	mitchell.reynolds@cvpre.com

The Developer has represented to the District that they are the owner of the following parcel(s) which is/are the subject of this Agreement and described herein as the “Property”:

Property Reference	City / County
APN: 0299-321-84	City of Yucaipa / San Bernardino County

RECITALS

WHEREAS, the Developer desires to develop its Property situated within the service area of the District consisting of a single lot development with a total of 1 unit; and

WHEREAS, the Developer has provided plans, drawings, and/or concepts to the District to construct the proposed “Project” as shown on Exhibit A attached hereto; and

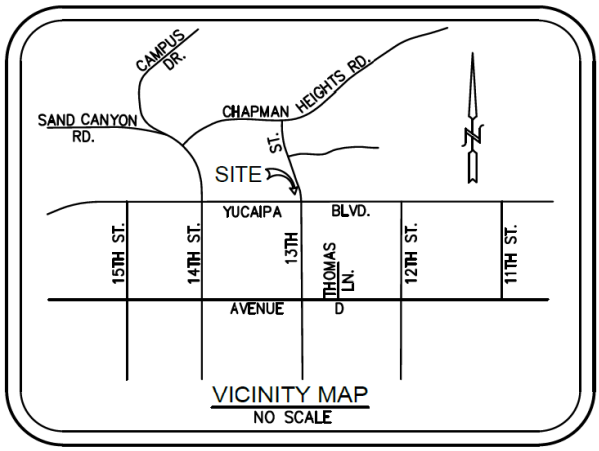
WHEREAS, the Developer desires to obtain sewer service from the District for the Project in accordance with the current Rules, Regulations, and Policies of the District; and General Construction Conditions; and

WHEREAS, it is the purpose of this Agreement to set forth the terms and conditions by which the District will provide service to the Project.

AGREEMENT

NOW, THEREFORE, in consideration of the mutual promises and covenants contained herein, the Developer and the District agree as follows:

A. **Project Overview.** The proposed development consists of a gross land area of .96 acres on the northwest corner of 13th Street and Yucaipa Boulevard in the City of Yucaipa (the "Property). The commercial development will receive sewer service from the Yucaipa Valley Water District.



The Yucaipa Valley Water District has been involved in the preliminary review process for this Project and has established the following development related project files: Elements Service Order No. 17932.

B. **Special Conditions.** In addition to the General Construction Conditions, the following conditions, is contained herein, are hereby required by the District for the Developer to receive service for the Project.

1. Project Specific Drinking Water Conditions: The Project is within the service area of Western Heights Water Company, thus will not be served by the District.

2. Project Specific Recycled Water Conditions: The Project is within the service area of Western Heights Water Company, thus will not be served by the District.

3. Project Specific Sewer Conditions: The Project will receive sewer service from the Yucaipa Valley Water District. The Developer shall design and construct, at its sole cost and expense, on-site and/or off-site sewer infrastructure ("Facilities") pursuant to District approved plans and requirements.

    a. The existing 8-inch sewer main in 13th Street should be adequate for the needs of this project.

    b. The Project requires a 6-inch commercial sewer lateral. District staff has identified a 6-inch sewer lateral in 13th Street per the 2019 Yucaipa Valley Water District Standard Drawings S-22. A sewer lateral cut off wall per the 2019 Yucaipa Valley Water District Standard Drawings S-27 may be required for the project.

4. Project Specific Stormwater Conditions. The City of Yucaipa and/or the County of San Bernardino will retain responsibility and authority for stormwater-related to the Project.

C.

1. Project Specific Conditions. The Developer, at its sole cost and expense, shall design and construct all Facilities and related appurtenances pursuant to the District approved plans and construction drawings to serve the Project.

   a. The District will not provide sewer service to the Project until the necessary infrastructure is completed and accepted by the District.

2. Rates, Fees and Charges.

   a. The most current rates, fees, and charges will be payable pursuant to the Resolution/Ordinance in effect at the time building permits are issued or renewed for each lot.

   b. The Developer shall pay the sustainability fees and deposits based on the Facility Capacity Charge and Development Invoice – Summary sheet.

3. Ownership; Operation and Maintenance. Once constructed and accepted by the District, title to the Facilities (excluding private, on-site Facilities) will be conveyed by the Developer to the District, and the District will operate and maintain the Facilities and provide service to the Developer's Property in accordance with the District's Rules, Regulations and Policies and the provisions of this Agreement.

4. Easements, Dedications, and Recorded Documentation: All easements, dedications, and recorded documentation required by the District shall be provided by the Developer to the District prior to the release of occupancy of any structure within the Project.

5. Annexation. This Project is located within the service area of the District, so an annexation is not required.

6. Amendment. This Agreement may be amended, from time-to-time, by mutual agreement, in writing signed by both Parties. The District and the Developer further agree that to the extent this Agreement does not address all aspects of the Developer's Property and/or Project, the Parties will meet and confer and negotiate in good faith and execute a written amendment or supplement to this Agreement.

7. Assignment. This Agreement will not be assigned, whether in whole or in part by either Party.

8. Term and Termination of Agreement. Unless extended by mutual agreement of the parties in writing, this Agreement shall terminate at 5:00 p.m., on the day before the sixth (6th) anniversary date of this Agreement; provided, however, that this Agreement shall automatically terminate, without further liability to either party, as follows:

   a. Immediately, upon abandonment by the Developer of the Developer's Property and/or the work hereunder. "Abandonment" is defined as the act of bankruptcy or Developer's failure to improve the Property in a manner consistent with the proposed development plan within twelve months of the effective date of this Agreement; and/or

   b. Within 45 days of the date of the issuance of a Notice of Default by the District to the Developer in the event, the Developer fails or refuses to perform, keep or observe any of the terms, conditions or covenants set forth in this Agreement.

IN WITNESS WHEREOF, the parties have executed is Agreement to be effective on the day and year first above written.

YUCAIPA VALLEY WATER DISTRICT

Dated: _____ By: _____
Chris Mann, Board President

DEVELOPER

Dated: _____ By: _____
John Zachary Bonsall c/o CVP - Yucaipa DB, LLC

Print Name: _____

Print Title: Manager CVP - Yucaipa DB, LLC

Attachments	Status
Exhibit A - Proposed Development Concept	Included

Exhibit A - Proposed Development Concept

Board Reports and Comments

Yucaipa Valley Water District

Yucaipa Valley Water District

FACTS ABOUT THE YUCAIPA VALLEY WATER DISTRICT

Service Area Size: 40 square miles (sphere of influence is 68 square miles)

Elevation Change: 3,140 foot elevation change (from 2,044 to 5,184 feet)

Number of Employees: 5 elected board members
72 full time employees

FY 2019-20 Operating Budget: Water Division - $14,455,500
Sewer Division - $12,217,712
Recycled Water Division - $1,301,447

Number of Services: 13,794 drinking water connections serving 19,243 units
14,104 sewer connections serving 22,774 units
111 recycled water connections serving 460 units

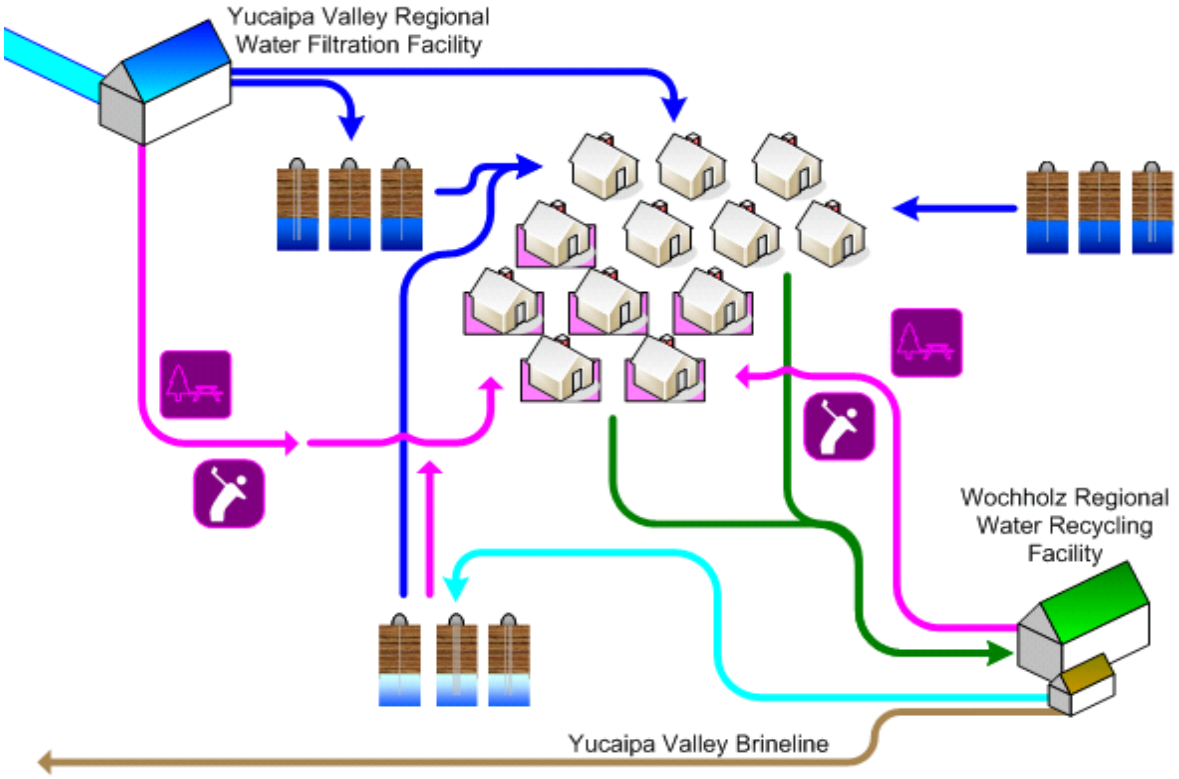
Water System: 223 miles of drinking water pipelines
2,033 fire hydrants
27 reservoirs - 34 million gallons of storage capacity
18 pressure zones
2.958 billion gallon annual drinking water demand
Two water filtration facilities:
- 1 mgd at Oak Glen Surface Water Filtration Facility
- 12 mgd at Yucaipa Valley Regional Water Filtration Facility

Sewer System: 8.0 million gallon treatment capacity - current flow at 3.5 mgd
213 miles of sewer mainlines
4,504 sewer manholes
5 sewer lift stations
1.27 billion gallons of recycled water produced per year

Recycled Water: 22 miles of recycled water pipelines
5 reservoirs - 12 million gallons of storage
0.681 billion gallon annual recycled water demand

Brine Disposal: 2.2 million gallon desalination facility at sewer treatment plant
1.756 million gallons of Inland Empire Brine Line capacity
0.595 million gallons of treatment capacity in Orange County

Sustainability Plan: A Strategic Plan for a Sustainable Future: The Integration and Preservation of Resources, adopted on August 20, 2008.



Typical Rates, Fees and Charges:

- Drinking Water Commodity Charge:

1,000 gallons to 15,000 gallons	$1.429 per each 1,000 gallons
16,000 gallons to 60,000 gallons	$1.919 per each 1,000 gallons
61,000 gallons to 100,000 gallons	$2.099 per each 1,000 gallons
101,000 gallons or more	$2.429 per each 1,000 gallons

- Recycled Water Commodity Charge:

1,000 gallons or more	$1.425 per each 1,000 gallons

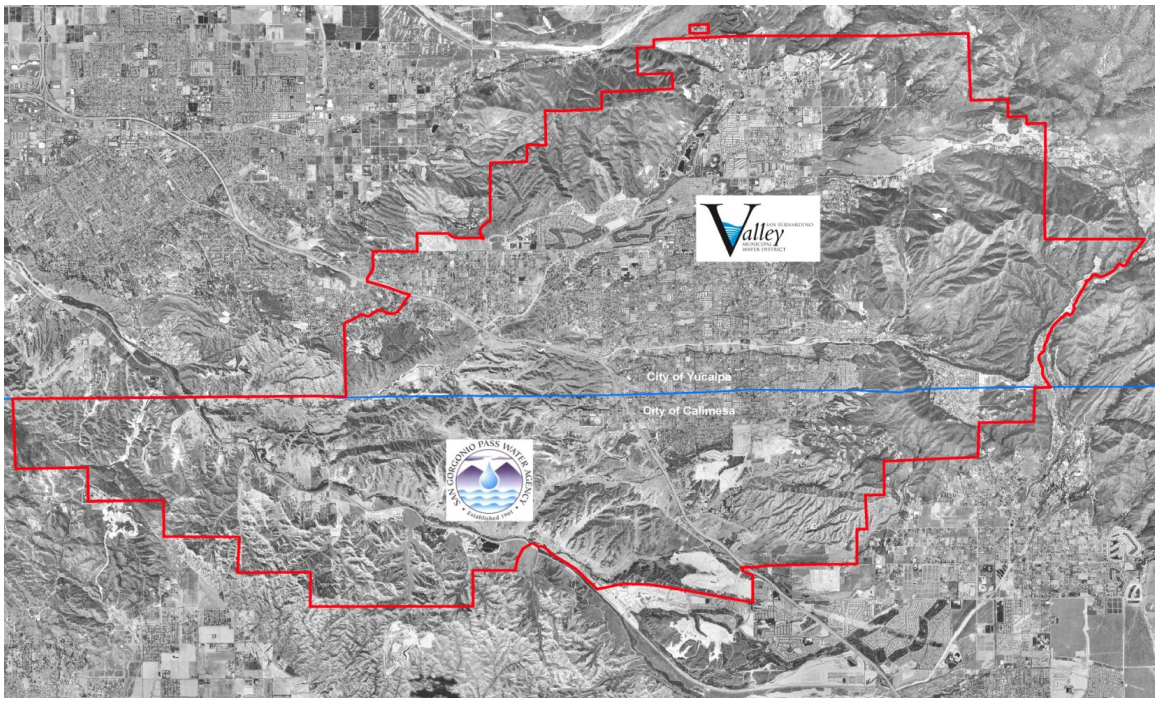
- Water Meter Service Charge (Drinking Water or Recycled Water):

5/8” x 3/4” Water Meter	$14.00 per month
1” Water Meter	$23.38 per month
1-1/2” Water Meter	$46.62 per month

- Sewer Collection and Treatment Charge:

Typical Residential Charge	$42.43 per month

State Water Contractors: San Bernardino Valley Municipal Water District
San Gorgonio Pass Water Agency



	San Bernardino Valley Municipal Water District	San Gorgonio Pass Water Agency
Service Area Size	353 square miles	222 square miles
Table "A" Water Entitlement	102,600 acre feet	17,300 acre feet
Imported Water Rate	$125.80 / acre foot	$399 / acre foot
Tax Rates for FY 2019-20	$0.1425 per $100	$0.1775 per $100
Number of Board Members	Five (5)	Seven (7)
Operating Budget FY 2019-20	$58,372,000	$9,551,000

Imported Water Charges (Pass-through State Water Project Charge)

- San Bernardino Valley Municipal Water District - Customers in San Bernardino County or City of Yucaipa pay a pass-through amount of $0.270 per 1,000 gallons.

- San Gorgonio Pass Water Agency - Customers in Riverside County or City of Calimesa pay a pass-through amount of $0.660 per 1,000 gallons. A proposed rate change to $0.857 per 1,000 gallons is pending future consideration by YVWD.

Yucaipa Valley Water District

GLOSSARY OF COMMONLY USED TERMS

Every profession has specialized terms which generally evolve to facilitate communication between individuals. The routine use of these terms tends to exclude those who are unfamiliar with the particular specialized language of the group. Sometimes jargon can create communication cause difficulties where professionals in related fields use different terms for the same phenomena.

Below are commonly used water terms and abbreviations with commonly used definitions. If there is any discrepancy in definitions, the District's Regulations Governing Water Service is the final and binding definition.

Acre Foot of Water - The volume of water (325,850 gallons, or 43,560 cubic feet) that would cover an area of one acre to a depth of 1 foot.

Activated-Sludge Process - A secondary biological wastewater treatment process where bacteria reproduce at a high rate with the introduction of excess air or oxygen and consume dissolved nutrients in the wastewater.

Annual Water Quality Report - The document is prepared annually and provides information on water quality, constituents in the water, compliance with drinking water standards and educational material on tap water. It is also referred to as a Consumer Confidence Report (CCR).

Aquifer - The natural underground area with layers of porous, water-bearing materials (sand, gravel) capable of yielding a supply of water; see Groundwater basin.

Backflow - The reversal of water's normal direction of flow. When water passes through a water meter into a home or business it should not reverse flow back into the water mainline.

Best Management Practices (BMPs) - Methods or techniques found to be the most effective and practical means in achieving an objective. Often used in the context of water conservation.

Biochemical Oxygen Demand (BOD) - The amount of oxygen used when organic matter undergoes decomposition by microorganisms. Testing for BOD is done to assess the amount of organic matter in water.

Biosolids - Biosolids are nutrient rich organic and highly treated solid materials produced by the wastewater treatment process. This high-quality product can be recycled as a soil amendment on farmland or further processed as an earth-like product for commercial and home gardens to improve and maintain fertile soil and stimulate plant growth.

Capital Improvement Program (CIP) - Projects for repair, rehabilitation, and replacement of assets. Also includes treatment improvements, additional capacity, and projects for the support facilities.

Certificate of Participation (COP) – A type of financing where an investor purchases a share of the lease revenues of a program rather than the bond being secured by those revenues.

Coliform Bacteria - A group of bacteria found in the intestines of humans and other animals, but also occasionally found elsewhere used as indicators of sewage pollution. E. coli are the most common bacteria in wastewater.

Collections System - In wastewater, it is the system of typically underground pipes that receive and convey sanitary wastewater or storm water.

Conjunctive Use - The coordinated management of surface water and groundwater supplies to maximize the yield of the overall water resource. Active conjunctive use uses artificial recharge, where surface water is intentionally percolated or injected into aquifers for later use. Passive conjunctive use is to simply rely on surface water in wet years and use groundwater in dry years.

Consumer Confidence Report (CCR) - see Annual Water Quality Report.

Contaminants of Potential Concern (CPC) - Pharmaceuticals, hormones, and other organic wastewater contaminants.

Cross-Connection - The actual or potential connection between a potable water supply and a non-potable source, where it is possible for a contaminant to enter the drinking water supply.

Disinfection by-Products (DBPs) - The category of compounds formed when disinfectants in water systems react with natural organic matter present in the source water supplies. Different disinfectants produce different types or amounts of disinfection byproducts. Disinfection byproducts for which regulations have been established have been identified in drinking water, including trihalomethanes, haloacetic acids, bromate, and chlorite

Drought - a period of below average rainfall causing water supply shortages.

Fire Flow - The ability to have a sufficient quantity of water available to the distribution system to be delivered through fire hydrants or private fire sprinkler systems.

Gallons per Capita per Day (GPCD) - A measurement of the average number of gallons of water use by the number of people served each day in a water system. The calculation is made by dividing the total gallons of water used each day by the total number of people using the water system.

Groundwater Basin - An underground body of water or aquifer defined by physical boundaries.

Groundwater Recharge - The process of placing water in an aquifer. Can be a naturally occurring process or artificially enhanced.

Hard Water - Water having a high concentration of minerals, typically calcium and magnesium ions.

Hydrologic Cycle - The process of evaporation of water into the air and its return to earth in the form of precipitation (rain or snow). This process also includes transpiration from plants, percolation into the ground, groundwater movement, and runoff into rivers, streams, and the ocean; see Water cycle.

Levels of Service (LOS) - Goals to support environmental and public expectations for performance.

Mains, Distribution - A network of pipelines that delivers water (drinking water or recycled water) from transmission mains to residential and commercial properties, usually pipe diameters of 4" to 16".

Mains, Transmission - A system of pipelines that deliver water (drinking water or recycled water) from a source of supply the distribution mains, usually pipe diameters of greater than 16".

Meter - A device capable of measuring, in either gallons or cubic feet, a quantity of water delivered by the District to a service connection.

Overdraft - The pumping of water from a groundwater basin or aquifer in excess of the supply flowing into the basin. This pumping results in a depletion of the groundwater in the basin which has a net effect of lowering the levels of water in the aquifer.

Pipeline - Connected piping that carries water, oil, or other liquids. See Mains, Distribution and Mains, Transmission.

Point of Responsibility, Metered Service - The connection point at the outlet side of a water meter where a landowner's responsibility for all conditions, maintenance, repairs, use and replacement of water service facilities begins, and the District's responsibility ends.

Potable Water - Water that is used for human consumption and regulated by the California Department of Public Health.

Pressure Reducing Valve - A device used to reduce the pressure in a domestic water system when the water pressure exceeds desirable levels.

Pump Station - A drinking water or recycled water facility where pumps are used to push water up to a higher elevation or different location.

Reservoir - A water storage facility where water is stored to be used at a later time for peak demands or emergencies such as fire suppression. Drinking water and recycled water systems will typically use concrete or

steel reservoirs. The State Water Project system considers lakes, such as Shasta Lake and Folsom Lake to be water storage reservoirs.

Runoff - Water that travels downward over the earth's surface due to the force of gravity. It includes water running in streams as well as over land.

Santa Ana River Interceptor (SARI) Line - A regional brine line designed to convey 30 million gallons per day (MGD) of non-reclaimable wastewater from the upper Santa Ana River basin to Orange County Sanitation District for treatment, use and/or disposal.

Secondary treatment - Biological wastewater treatment, particularly the activated-sludge process, where bacteria and other microorganisms consume dissolved nutrients in wastewater.

Service Connection - The water piping system connecting a customer's system with a District water main beginning at the outlet side of the point of responsibility, including all plumbing and equipment located on a parcel required for the District's provision of water service to that parcel.

Sludge - Untreated solid material created by the treatment of wastewater.

Smart Irrigation Controller - A device that automatically adjusts the time and frequency which water is applied to landscaping based on real-time weather such as rainfall, wind, temperature, and humidity.

South Coast Air Quality Management District (SCAQMD) - Regional regulatory agency that develops plans and regulations designed to achieve public health standards by reducing emissions from business and industry.

Special district - A form of local government created by a local community to meet a specific need. Yucaipa Valley Water District is a County Water District formed pursuant to Section 30000 of the California Water Code

Supervisory Control and Data Acquisition (SCADA) - A computerized system which provides the ability to remotely monitor and control water system facilities such as reservoirs, pumps, and other elements of water delivery.

Surface Water - Water found in lakes, streams, rivers, oceans, or reservoirs behind dams. In addition to using groundwater, Yucaipa Valley Water District receives surface water from the Oak Glen area.

Sustainable Groundwater Management Act (SGMA) - Pursuant to legislation signed by Governor Jerry Brown in 2014, the Sustainable Groundwater Management Act requires water agencies to manage groundwater extractions to not cause undesirable results from over production.

Transpiration - The process by which water vapor is released into the atmosphere by living plants.

Trickling filter - A biological secondary treatment process in which bacteria and other microorganisms, growing as slime on the surface of rocks or plastic media, consume nutrients in wastewater as it trickles over them.

Underground Service Alert (USA) - A free service (https://www.digalert.org) that notifies utilities such as water, telephone, cable and sewer companies of pending excavations within the area (dial 8-1-1 at least 2 working days before you dig).

Urban runoff - Water from city streets and domestic properties that carry pollutants into the storm drains, rivers, lakes, and oceans.

Valve - A device that regulates, directs, or controls the flow of water by opening, closing, or partially obstructing various passageways.

Wastewater - Any water that enters the sanitary sewer.

Water Banking - The practice of actively storing or exchanging in-lieu surface water supplies in available groundwater basin storage space for later extraction and use by the storing party or for sale or exchange to a third party. Water may be banked as an independent operation or as part of a conjunctive use program.

Water Cycle - The continuous movement water from the earth's surface to the atmosphere and back again.

Water Pressure - Water pressure is created by the weight and elevation of water and/or generated by pumps that deliver water to customers.

Water Service Line - A water service line is used to deliver water from the Yucaipa Valley Water District's mainline distribution system.

Water table - the upper surface of the zone of saturation of groundwater in an unconfined aquifer.

Water transfer - a transaction, in which a holder of a water right or entitlement voluntarily sells/exchanges to a willing buyer the right to use all or a portion of the water under that water right or entitlement.

Watershed - A watershed is the region or land area that contributes to the drainage or catchment area above a specific point on a stream or river.

Water-Wise House Call - a service which provides a custom evaluation of a customer's indoor and outdoor water use and landscape watering requirements.

Well - a hole drilled into the ground to tap an underground aquifer.

Wetlands - lands which are fully saturated or under water at least part of the year, like seasonal vernal pools or swamps.

Yucaipa Valley Water District

COMMONLY USED ABBREVIATIONS

AQMD	Air Quality Management District
BOD	Biochemical Oxygen Demand
CARB	California Air Resources Board
CCTV	Closed Circuit Television
CWA	Clean Water Act
EIR	Environmental Impact Report
EPA	U.S. Environmental Protection Agency
FOG	Fats, Oils, and Grease
GPD	Gallons per day
MGD	Million gallons per day
O & M	Operations and Maintenance
OSHA	Occupational Safety and Health Administration
POTW	Publicly Owned Treatment Works
PPM	Parts per million
RWQCB	Regional Water Quality Control Board
SARI	Santa Ana River Inceptor
SAWPA	Santa Ana Watershed Project Authority
SBVMWD	San Bernardino Valley Municipal Water District
SCADA	Supervisory Control and Data Acquisition system
SGMA	Sustainable Groundwater Management Act
SSMP	Sanitary Sewer Management Plan
SSO	Sanitary Sewer Overflow
SWRCB	State Water Resources Control Board
TDS	Total Dissolved Solids
TMDL	Total Maximum Daily Load
TSS	Total Suspended Solids
WDR	Waste Discharge Requirements
YVWD	Yucaipa Valley Water District