

INDIAN WELLS VALLEY GROUNDWATER AUTHORITY TECHNICAL ADVISORY COMMITTEE

Indian Wells Valley Water District 500 W. Ridgecrest Blvd. Ridgecrest, CA 93555

A G E N D A

Thursday, May 3rd, 2018, Time 1:00 p.m.

In compliance with the Americans with Disabilities Act, if you are a disabled person and you need a disability-related modification or accommodation to participate in this meeting, please contact Ronald Strand at (760) 499-5002. Requests must be made as early as possible and at least one full business day before the start of the meeting. Documents and material relating to an open session agenda items that are provided to the IWVGA TAC Committee prior to a regular meeting will be available for public inspection and copying at Indian Wells Valley Water District, 500 W. Ridgecrest Blvd, Ridgecrest, CA 93555, or online at www.co.kern.ca.us/groundwater/.

Statements from the Public

The public will be allowed to address the Committee during Public Comments about subjects within the jurisdiction of the IWVGA Technical Advisory Committee and that are NOT on the agenda. No action may be taken on off-agenda items unless authorized by law. Questions posed to the Committee may be answered after the meeting or at future meeting. Dialog or extended discussion between the public and the Committee or staff will be limited in accordance with the Brown Act. The Public Comments portion of the meeting shall be limited to three (3) minutes per speaker. Each person is limited to one comment during Public Comments. Legal representatives are available for information regarding the Brown Act and will be present for comments if needed.

All remarks and questions should be addressed to the Committee as a whole and not to any individual member or staff. There will be time after each action item on the agenda to receive comments from the public. Again each speaker will be limited to three (3) minutes. Speakers should be brief and limit their comments to the specific subject being discussed. Persons will be limited to one comment per person unless directed by the Chair.

1. CALL TO ORDER

2. PUBLIC COMMENTS

This time is reserved for the public to address the Committee about matters NOT on the agenda. No action will be taken on non-agenda items unless authorized by law. Comments are limited to three minutes per person.

3. APPROVAL OF PREVIOUS MEETING MINUTES

- a. April 5th TAC meeting Minutes

4. ADMINISTRATIVE ISSUES

- a. Welcome to new TAC members
- b. TAC - Ethics Training and Form 700 Status.
- c. Meeting Minutes

IWVGA TAC COMMITTEE
Meeting of May 3, 2018

5. TAC DISCUSSION OF GSP PRIORITY PROJECTS/TASKS

- a. Prop 1 Grant (Verbal report at meeting)
- b. TAC PAS Update/Modeling Schedule
- c. Data Gaps – Monitoring Wells
- d. GW Authority-DRI Agreement Scope/Budget—Two Options
- e. Draft DAC RFP Water Audit/Leak Detection
- f. Recycled Water
- g. Alternative/Imported Water & Conservation
- h. Pumping Fee/List of Wells-Owners

6. TAC DISCUSSION ON DWR TECHNICAL SERVICES FOR MONITORING WELLS

- a. Review and comments on DWR grant applications

7. FUTURE AGENDA ITEMS SCHEDULE

This time is reserved to inform the Committee of any items that are anticipated to be on the next agenda. No action may be taken unless authorized by law and public comments are limited to three minutes per person.

- a. PAS Items for June
 - i) Imported Water Opportunities
 - ii) Recycled Water Opportunities
 - iii) Data Gaps: Weather Stations and Stream Gages
 - iv) Modeling Schedule and Updates
 - v) Pumping Fee

8. FUTURE TAC MEETING DATES

- a. Thursdays of each month at 1pm as listed.
 - i) June: May 31st or June 7th
 - ii) July 12th
- b. Planned Ad-Hoc Assignments
 - i) June: TBD when DRI is contracted, POAM June 28th
 - ii) August: TBD when DRI is contracted, POAM August 15th

9. COMMITTEE MEMBER ANNOUNCEMENTS OR COMMENTS

10. ADJOURN

Indian Wells Valley Model Status & Status of Hydrogeologic Data Gaps: (Monitoring Wells)

May 3, 2018

IWV-TAC Meeting



Modeling Schedule (T) *changes are underlined*

Direct Model Item for the GSP	Start	Presentation / Submittal
IWV Basin Model: Model Update and Calibration TAC Model Workshops re: Historical & Baseline Recharge and Pumping Historical Calibration Historical Model Run and Water Budget	<u>May 2018</u>	Jun 2018 workshop Aug 2018 workshop <u>Oct 2018 TAC mtg</u>
MODEL: Baseline through 2070 Baseline Model Assumptions and Water Budget Baseline Model Run and Water Budget	Sep 2018	Oct 2018 TAC mtg Dec 2018 TAC mtg
MODEL: (4) Sustainable Management Alternatives through 2070 Monthly TAC discussion of Model Alternatives and Model Results	Nov 2018	Feb 2019
MODEL: Transport and Land Subsidence Analysis	Feb 2019	May 2019



Hydrogeologic Data Gaps: Monitoring Wells

Review of Data Gaps identified by TAC (from April 5 TAC mtg)
Initiated coordination with BLM SF299 permitting
outline of Seabee logistical requirements
field inspection of northwest basin

Next Steps:

Evaluating Data Gaps (1) GSP Monitoring of Groundwater Levels
(2) Additional Hydrogeologic Information
(3) Additional Salinity Information
Review recommendations from other on-going studies
(USGS Recharge, Brackish Water)
Field inspection of El Paso basin
Interface with Model (when DRI is contracted)
Prioritize data gaps



Hydrogeologic Data Gaps: Monitoring Wells

Existing Monitoring Network (Kern County)
2016 Groundwater Model Recommendations
Other On-going Studies (USGS Recharge, Brackish Water)

Initial Comments and Recommendations from the TAC
(following April 5 mtg; attached)

Navy / DRI
Tim Parker from IWVCGMG (?)
Don Decker



In-Kind Services and GA Obligation

Provided by In-Kind Services

- Navy Seabees – mud rotary drill crew
- BLM – environmental permitting
- Searles Mining – geophysical logging (TBD)
- Inyo County – well permitting (TBD)
- Kern County – monitoring program (TBD)

Provided by the GA

- Site selection, permit documents, logistics and coordination
- Geologic interpretation
- Determine screen interval and depth
- Surface completion
- Well development and sampling
- Post drilling site cleanup



Bureau of Land Management (BLM) Constraints

DESERT RENEWABLE ENERGY CONSERVATION PLAN (DRECP)

- CDNCL California Desert National Conservation Lands
- ACEC Areas of Critical Environmental Concern
Sierra Canyon Area, Mojave ground squirrel, desert tortoise
- SRMA Special Recreation Management Area
East Sierra SRMA
- NCLS Natural Conservation Area
- LWC Lands with Wilderness Characteristics
- VRM Visual Resource Management
- DFA Development Focus Areas
- WEMO Routes (BLM dirt roads to travel on)
- Biological and Archeological Review



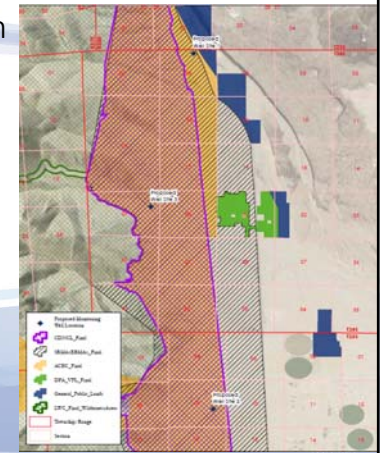
Seabees Constraints

- Blading 150 feet x 150 feet
- Mud rotary drilling with mud pit
- Spreading cuttings on site
- Working 24-hours, 7-days/week
- 6" diameter pvc well casing
- Minimal well development
- No surface completion
- Hospital within 10 minutes
- Close-by water supply



Initial Field Inspection - NW Basin

- Subflow from Little Lake Gap
- Tributary / Mountainfront Recharge
- from Nine-Mile, Sand, & Grapevine Canyons
- Existing stream gages
- Existing riparian corridor
- Existing Wells



Recommendations for Additional Well Locations in Indian Wells Valley

Desert Research Institute

November 30, 2016 (Revised April 23, 2018)

- After reviewing the SeeBee well location map with indicated priorities we recommend the following priorities for additional drilling locations (see attached map for proposed data collection activities; note that number scheme also represents priority):
 - Region 1: Area located between El Paso Valley and Indian Wells Valley. This location is in an area of high hydraulic gradient which are likely due to a local shear zone and/or other geologic controls such as shallow bedrock.
 - Region 2: El Paso Basin. Water levels are generally lacking in this area so additional wells to monitor groundwater levels would be helpful to understand the regional flow between El Paso and Indian Wells Valley.
 - Region 3: South of Ridgecrest. This is an area where high TDS groundwater is likely and relatively close to many high capacity production wells yet there is little information regarding deep (elevation < 500 m above mean sea level) TDS measurements.
 - Region 4: Central portion of the Little Lake Fault Zone. This area is known to act as a barrier to groundwater flow. There are only a few groundwater level measurements on either side of the fault so additional water level information is needed to parameterize the fault within the groundwater model.
 - Region 5: Central Agricultural Area. This region is known to have elevated TDS concentrations at depth and relatively complicated geology. Additional wells in this region could help further characterize the geology and spatial (both vertically and horizontally) distribution of TDS.
- Note that the data requirements identified in #2 above could be addressed through a variety of methods beyond drilling including:
 - Adding existing wells to the water level measurement network. A more thoughtful review of the existing network could be done to optimize monitoring wells locations in the context of regional groundwater data needs.
 - An ongoing water quality sampling campaign could be developed to answer many of the questions above; particularly items 2c and 2d.

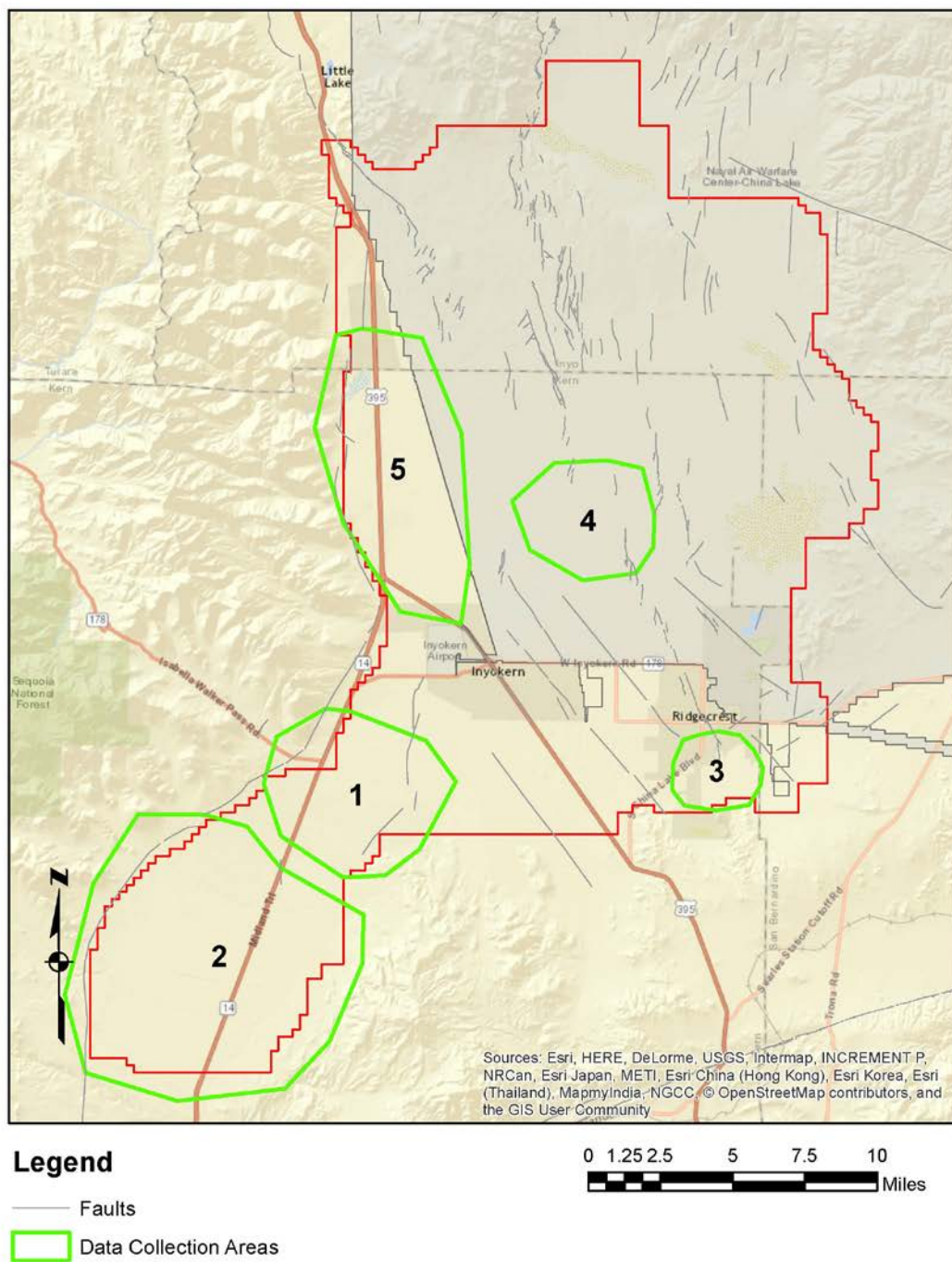
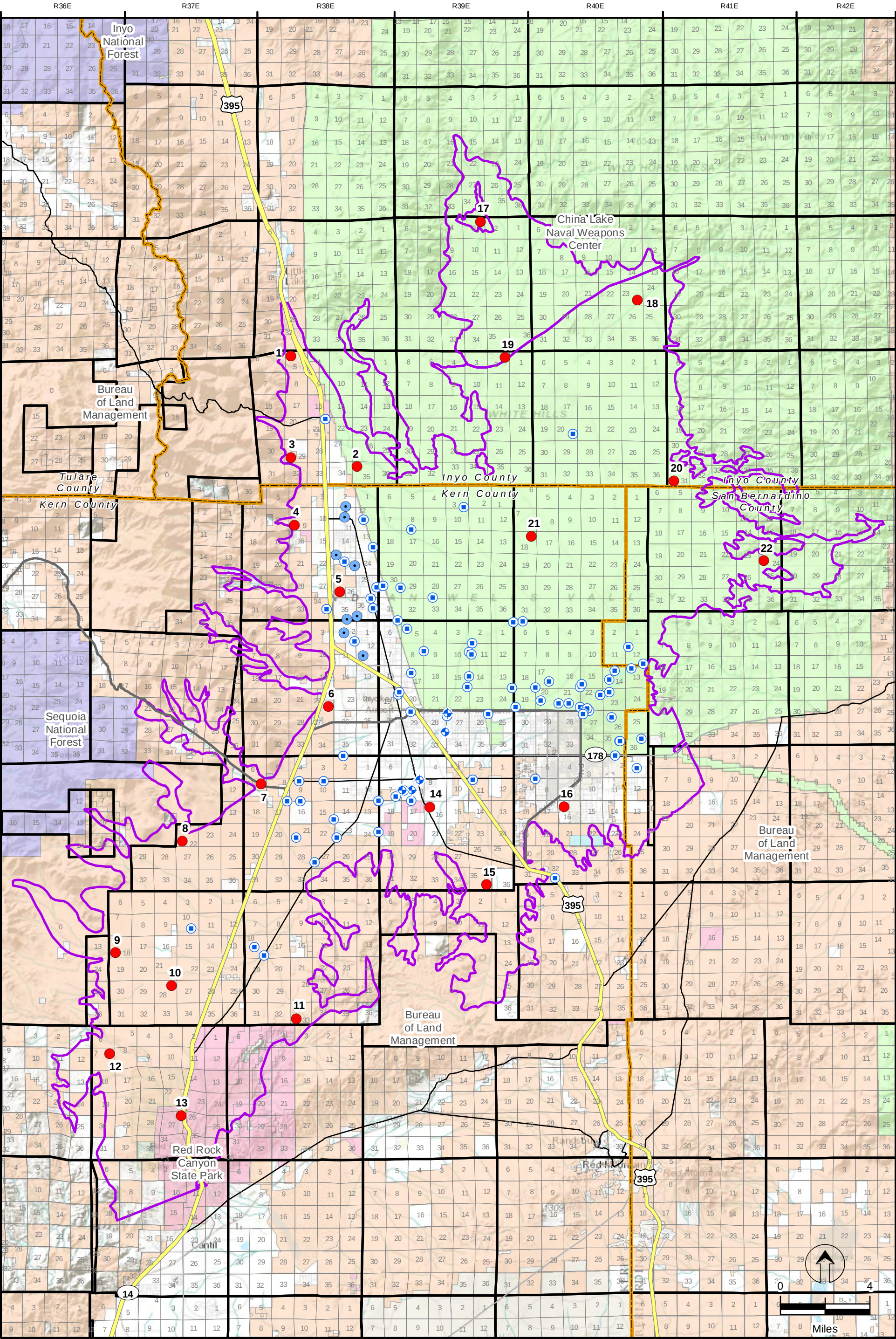


Figure 1. Proposed data collection regions.

Indian Wells Valley: Possible New Monitoring Well Locations

#	Township	Range	Section	Quarter	Ownership	Comment	Ranking
NW area							
1	24S	38E	5	NW	BLM	Inflow from Rose Valley	1
2	24S	38E	35	NW	China Lake	NW data-gap	8
3	24S	38E	290	SW	BLM	NW data-gap	11
Westerly recharge area							
4	25S	38E	9	SW	BLM	Sand Canyon recharge	2
5	25S	38E	28	SW	BLM	Grapevine Canyon recharge	3
6	26S	38E	22	SE	BLM	Indian Wells Canyon recharge	4
7	27S	38E	7	NE	BLM	Freeman Canyon recharge	5
8	27S	37E	22	SW	BLM	Cow Haven Canyon recharge	13
9	28S	37E	18	SW	BLM	Un-named Canyon recharge	14
SW Sub-basin area							
10	28S	37E	28	NE	BLM	SW sub-basin mapping	6
11	28S	38E	33	SW	BLM	SW sub-basin mapping	7
12	29S	37E	7	NE	BLM	SW sub-basin mapping	9
13	29S	37E	27	NE	State - Red Rock Canyon State Park	SW sub-basin mapping	10
SE area							
14	27S	39E	16	NW	Undetermined	SE data-gap	12
15	27S	39E	35	SE	BLM	SE data-gap	18
16	27S	40E	16	NW	Undetermined - Ridgecrest City Limits?	SE data-gap	19
NE area							
17	23S	39E	3	NE	China Lake	NE data-gap	20
18	23S	40E	23	SE	China Lake	NE data-gap	16
19	24S	39E	2	NE	China Lake	NE data-gap	17
20	24S	41E	31	SW	China Lake	NE data-gap	21
21	25S	40E	18	NE	China Lake	NE data-gap	15
22	25S	41E	24	SW	China Lake	NE data-gap	22

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Suggestions, location and rationale for specific GSA monitoring wells and location of proposed Seabee wells to be drilled as in-kind service by the US Navy.

From Dr. Don Decker , GA TAC member representing domestic well owners 4/25/2018

I. The IWV Basin 6-54 wells identified as monitoring wells for the purpose of establishing progress on achieving State of California mandated groundwater sustainability must meet the following location criteria:

- a) Be located to provide direct and accurate assessment of specific areas of the Basin known to be seriously impacted by overdraft. There are three areas so identified
 1. the Indian Wells Valley Water District (IWVWD) southwest pumping field area
 2. the intermediate pumping area centered on the intersection of Ward Ave and Jacks Ranch Rd. with a radius of about $\frac{3}{4}$ mile.
 3. the principal agricultural pumping area centered on N Brown Rd. and Neal Ranch Rd
- b) Be located additionally in Basin areas of little to no recognizable seasonal pumping disturbance to provide a whole Basin evaluation
- c) These specific locations must be identified by professional quantitative means so that there is a clear and defensible understanding of location and importance. The groundwater elevation monitoring data set being assembled by the Kern County Water Agency (KCWA) in ongoing bi-annual field measurements meets this requirement. This data set has been designed to be legally defensible. The 5 year elevation change maps plotted from the published well data is an especially valuable visual aid in identification of the impacted areas.
- d) The monitoring wells chosen should not be pumping wells and should not be located so close to major pumping wells to be seriously affected by the drawdown cones of such wells. It is difficult to entirely separate transient pumping from high capacity wells from larger scale Basin effects. However, even where there is pumping well interference, biannual or more frequent well measurement can unambiguously identify the cyclic seasonal demand component. A monitoring well so affected can easily provide defensible data. To minimize pumping well interference a monitoring well should be located with a separation distance of $\frac{1}{2}$ mile or greater.
- e) The monitoring well selection criteria should emphasize existing wells with
 1. substantial characterization ie, geophysical logging, professional design and known construction details
 2. wells with an existing depth to water data set. Wells already being monitored by the KCWA are ideal. There is 30 years of past and current data in this set.
 3. wells with a remaining life expectancy long enough to provide several decades of additional service
- f) It is important to realize that although modern digital data logging is convenient, none of the well changes anticipated in this monitoring effort require or even benefit from real time monitoring. The cost of new data loggers and their maintenance must be balanced against the other financial demands of this GSP project. The monitoring wells proposed in this document are nearly all in the KCWA well list and are being monitored by that agency biannually. Virtually no additional expenditure is required to utilize this data.

II Suggested monitoring wells, locations and rationale meeting the criteria just listed

a) North Brown Rd agricultural pumping area

1. BoR 5 Location: west of major pumping Location: intended to provide Sierra front recharge evidence in conjunction with data from NR1 And 2. area Value: multiple piezometers, full well characterization:

2. BoR 6, Location east and north of major pumping areas Value multiple piezometers, full characterization, Comment: on Navy property
3. monitoring well at the intersection of Avenida del Sol and Rail St Location: centered in the Brown Rd pumping area but separated by 1/2mi from major pumping. Well is on Mojave Pistachios property.
4. NR1 or NR2 Location: Neal Ranch Value: multiple piezometers, full characterization, comments: wells constructed to the same standards as the BoR wells. Wells are on Mojave pistachios property.
5. North American Chemical Company well 17-1 Location: southeast of major pumping area Value: excellent location, fully characterized Comment: on Navy controlled property

b) Intermediate pumping area

1. BoR 4 Location: west of major Intermediate area pumping
2. US Navy well E1 (367) Location northwest of major Intermediate pumping
3. IWVWD MW32 Location: west of Intermediate in a smaller area of IWVWD pumping. Value: well constructed to BoR standards
4. Searles Valley Minerals abandoned well in section 30 ?

c) Southwest pumping area

6. BoR 3 Location On the east edge of major SW pumping area Value: multiple piezometers, full characterization,
7. Old Inyo well Location: West of major pumping area near the sw barrier fault Value: very long measurement history
8. Bennett or Whitfield well Location: southeast of major pumping area Value: long measurement history
9. Abandoned ? IWVWD monitoring well at the “balloon festival” site Location: north of major pumping area Value: unique and essential location

d) Overall Basin 6-54 monitoring wells

1. IWVWD abandoned well no12 Location: south of Intermediate pumping area and near the south edge of the productive basin Value: relatively isolated from major pumping
2. US Navy monitoring well MW02-03 Location: just south of the Airfield Value well characterized, long measurement history
3. “Bucket “ well Location Southeast of major production Value: 50 years of well measurements but now dry Comments: will require deepening but would be extremely valuable. Nearby R1(263) may still have water
4. other Navy wells such as SNORT 2

III Suggested location of Seabee wells

These wells can be drilled only on Federal land, including BLM and the Navy controlled properties. The timeline for Seabee well construction is not controlled by the GA. There obviously is no historical water level data associated with any of these yet to be drilled wells. The principal value of these wells would be to supplement the understanding of existing Basin hydrology. This writer strongly suggests further exploration of the Southwest barrier fault and nearby areas. BoR1 is south of the barrier by observation of the observed water levels in that well. Here are this writer’s suggested locations

1. Wells further southwest and northeast of BoR 1 would be very useful. The separation from BoR1 should be within ½ to ¾ mile to be most useful.
2. An earlier Seabee well, 13A is apparently drilled in the disturbed fault zone. This well is 1 mile west and ½ mile south of the IWVWD well 18. Again, additional wells drilled southwest and northeast of this location would be useful. These wells should likely be within ½ mile of the existing well if the purpose is to explore the extent of the fault. The visible expression of the fault as observed from the air is quite narrow, perhaps only 100’.

IV Comments and references

1. All BoR wells were completed to a nominal depth of 2000' and equipped with multiple piezometers, except for BoR 4 which has only one. These wells were fully characterized with state of the art logging. The BoR Final Report can be found below.
2. Several other monitoring wells were drilled by the IWVWD at about the same time period and were constructed to the same standards as the BoR wells. They are: NR1, NR2 and MW32.
3. SNORT 1 was drilled by the Navy about the same time and is drilled to bedrock (about 7600') This exploratory well was also thoroughly characterized. This well may be available for further use. SNORT 2 is nearby and was completed to 1200 '. This well would be more appropriate for water level monitoring
4. References
 - a) *U.S. Bureau of Reclamation, 1993. Indian Wells Valley groundwater project, USBR Technical Report Vol I and II.*
 - b) *TriEcoTt, joint venture 2012. Technical justification for beneficial use changes for groundwater in Salt Wells Valley and shallow groundwater in eastern Indian Wells Valley. Prepared for the US Navy Naval Facilities Engineering Command, San Diego, California.*



861 Village Oaks Drive, Suite 100 • Covina , California 91724
Phone: (626) 967-6202 • FAX: (626) 331-7065 • Web site: www.stetsonengineers.com

Northern California • Southern California • Arizona • Colorado

Reply to: Covina

Memorandum

TO: Indian Wells Valley Groundwater Authority
Technical Advisory Committee (TAC)

FROM: Stetson Engineers Inc.

SUBJECT: Request for Proposal Water Audit, Leak Detection and Repair
Program

JOB NO.: 2652

DATE: April 26, 2018

The Proposition 1 grant funding application submitted for the Indian Wells Valley Groundwater Authority under the California Department of Water Resources Sustainable Groundwater Planning grant program included two projects for Severely Disadvantaged Communities. One of these projects was the Indian Wells Valley Groundwater Basin Water Audit, Leak Detection and Repair Program. This program is intended to be pilot program to determine if water conservation programs in the SDACs are effective and to evaluate whether such programs should be included in the management actions for the Groundwater Sustainability Plan. The attached draft Request for Proposal (RFP) to obtain a contractor to conduct a Water Audit, Leak Detection and Repair Program was prepared in accordance with the Prop 1 grant application workplan and is provided for your review and comment.

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REQUEST FOR PROPOSALS

Water Audit, Leak Detection and Repair Program

June 2018

Proposal Submission Deadline:

July ___, 2018 – 3:00 PM PT

Make all inquiries and send all questions to:

Karen Brunelle, Stetson Engineers Inc.

861 S. Village Oaks Drive, Suite 100, Covina, CA 91724

Telephone: 626-967-6202

E-mail: karenb@stetsonengineers.com

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Attachments

Attachment A: Scope of Services

Attachment B: Standard IWVGA Contractor Agreement

I. Introduction

The Indian Wells Valley Groundwater Authority (IWVGA) is requesting proposals from qualified firms for implementation of a water audit, leak detection and repair program. IWVGA intends to issue a contract for these services that would end by December 2019. The water audit, leak and repair program will benefit the Severely Disadvantaged Communities (SDACs) of Inyokern and China Lake Acres in the Indian Wells Valley groundwater basin and could ultimately expand into other SDACs in the Indian Wells Valley groundwater basin area. This document outlines the requirements and minimum qualifications, selection process, and documentation necessary to submit a Proposal.

A. Background

The Indian Wells Valley groundwater basin is located east of the southern Sierra Nevada Range in California with an area of approximately 382,000 acres underlying portions of Inyo, Kern, and San Bernardino Counties. The Indian Wells Valley groundwater basin is identified by the Department of Water Resources (DWR) as Basin 6-54 in Bulletin No. 118. In July 2016, the IWVGA was formed through a Joint Exercise of Powers Agreement for the purpose of forming a Groundwater Sustainability Agency (GSA) to manage the Indian Wells Valley groundwater basin and to implement Sustainable Groundwater Management Act (SGMA) requirements, including the development of a Groundwater Sustainability Plan (GSP). The IWVGA consists of the following voting member agencies:

1. City of Ridgecrest (a public agency)
2. Indian Wells Valley Water District (a public utility)
3. County of Kern (a public agency)
4. County of Inyo (a public agency)
5. County of San Bernardino (a public agency)

along with the United States Department of the Interior Bureau of Land Management and the United States Navy, Naval Air Weapons Station China Lake as non-voting associate members.

B. Purpose of the Request

IWVGA is looking for a qualified consultant to prepare the water audits and conduct leak detections and repairs. The qualified consultant will implement a water loss control program (a water audit and leak detection) to evaluate the potential water, energy, and cost savings, and subsequently implement a leak repair program to correct the issues identified by the water loss control procedures. The following list summarizes the potential means in which water losses occur for SDACs in the Indian Wells Valley groundwater basin:

- Leakage from transmission and distribution pipelines
- Leakage and overflows from storage tanks
- Leakage from service connection pipelines up to and including the water meter

- Unauthorized water consumption (e.g. theft)
- Administrative errors (e.g. under-billing)
- Systematic data handling errors in the meter reading and billing processes
- Metering inaccuracies or failure
- Non-revenue water, including unbilled metered consumption and unbilled unmetered consumption

II. Scope of Services

Attachment A is the Scope of Services listing major work tasks that may be requested.

III. Proposal Format

A. RFP Manager

All questions and correspondence regarding the proposal documents and proposal should be directed in writing referencing "IWVGA Water Audit, Leak Detection and Repair Program" to:

Stetson Engineers Inc.
861 S. Village Oaks Drive, Suite 100
Covina, CA 91724
Attention: Karen Brunelle
Phone: 626-967-6202
E-Mail: karenb@stetsonengineers.com

Pre-proposal questions will be accepted via email no later than 3:00 p.m. on **Monday, _____, 2018**. All questions received will be answered electronically via email to all participating Proposers. All Proposers interested in submitting a proposal must email their intention by **_____, 2018**, to guarantee receipt of IWVGA's answers to all pre-proposal questions. Proposers must also acknowledge receipt of pre-proposal clarifications in their proposal.

B. Timetable

Responses to this Request for Proposal (RFP) with sealed proposals are due and must be received in Stetson Engineers' Office, 861 S. Village Oaks Drive, Suite 100, Covina, CA 91724, no later than **3:00p.m., Pacific Time, on Thursday, _____, 2018**. No proposals shall be accepted after that time. IWVGA assumes no responsibility for delays caused by delivery service. Postmarking by the due date will not substitute for actual receipt. Hand delivery before the deadline is recommended. Proposals received after the time and date listed above shall be returned to the proposer unopened.

The following schedule has been established for this RFP:

RFP Release Date	Friday, June 1, 2018
Proposers Submittal of Interest/Pre-Proposal Questions Due	Monday, June xx, 2018
Proposals Due	Wednesday, July xx, 2018
Interviews Scheduled	Week of July xx, 2018

Consultant Selected	Wednesday, August xx, 2018
Final Contract Negotiations	Wednesday, Augst xx, 2018
IWVGA Board Approval of Contract	Monday, September xx, 2018
Projected Contract Start Date	Thursday, September xx, 2018

C. Proposal Submission Instructions

All proposals must meet the content requirements and format guidelines listed below in the "Proposal Content Guidelines" section. The complete proposal shall be submitted by the due date in a sealed envelope marked "PROPOSAL FOR IWVGA Water Audit, Leak Detection and Repair Program". A total of two (2) complete double-sided copies on paper containing a minimum of 20% post-consumer recycled content and one (1) electronic copy of the proposal. Proposals must be submitted in a sealed envelope, which details the business name, business address and contact person of the respondent. Responses must be addressed to the attention of Karen Brunelle, Stetson Engineers Inc.

D. Proposal Content Guidelines

Proposals must be submitted with all documents required by this Request for Proposal. Proposals not submitted with all the required information may be considered incomplete and rejected by IWVGA. Proposals may be rejected if they show any alterations of form, additions not called for, conditional or alternative proposals, incomplete proposals, erasures, or irregularities of any kind. Any statement or qualification in proposal form, or attached to, or included therewith, serving to qualify proposal, or containing conflicting statements, or otherwise rendering proposal ambiguous or uncertain, will disqualify the proposal. IWVGA reserves the rights to reject any or all proposals.

1. Introduction

Proposals should include the following:

- a) A letter of introduction briefly describing an understanding of the requested scope of work and qualifications to undertake this work such as experience in providing like services, background of the firm(s) and resumes of the principals involved.
- b) Additional material such as brochures and photos, promotional material, references, and supplemental graphics, applicable to the content of the proposal.
- c) Signature by an individual authorized by the firm or partnership to bind the firm or partnership to the proposal.

2. Project Team

- a) Prime team members: Name of entity submitting the proposal, its mailing address, telephone number, facsimile number, email address, the name of contact individual as well as the signature of principal/owner/officer in case of joint venture or other. Describe business and background, including the size, location, capacity, type of firm, and year established.

- b) If applicable, subcontractors: List subcontractors with individual addresses, telephone numbers, facsimile numbers, email addresses, and areas of expertise.
- c) Briefly describe the project responsibility of each team member.

3. Project Personnel

Description of organization, management, and team members. Provide a description of the firm's organization and a work plan that identifies the personnel to be assigned to each task. The organization description should clearly identify the project manager and the day-to-day contact person for the project. Contract terms will not permit substitution of lead personnel without prior approval by IWVGA. Description of qualifications of the professional personnel to be employed with a summary of similar works performed and a resume for each professional.

4. References, Related Experience and Examples of Work

Provide at least three client references (contact name, title, company name, address, phone number, and e-mail address) for relevant work. Specify the client, location, type of work, implementation results or status, examples of work, and other relevant information as needed.

5. Additional Documents Required

In addition to the information required in the previous sections, the response must include the following:

- a) A statement that the firm is financially sound and has financial resources sufficient to successfully execute the contract.

6. Fee Schedule

Provide fee structure and schedule for the included services. Include year one and subsequent years, if there is an initial service setup fee. Provide an itemized fee list in the proposal.

7. Contract

Comments and exceptions, if any, to IWVGA's standard contractor agreement and insurance requirements, should be noted. It is understood that prospective consultants have reviewed the agreements (Attachments B) and will take exception only to those items identified in the proposals. If there are any concerns or proposed exceptions requested to the standard contractor agreement, these issues are to be discussed at the time of the interview.

IV. Selection Process

A. Qualifications

All proposals received by the due date will be evaluated by IWVGA. Only information which is received in response the RFP and input from references will be evaluated. IWVGA will judge responses of each proposing firm in several critical areas.

The selection process shall proceed as follows:

1. Based upon the submitted written responses to this RFP, the IWVGA selection panel may select up to three qualified consultants to interview.

2. At the interview, the selection panel will expect the qualified consultants to give a presentation on their proposed approach to implementing the program. The project manager/main contact for this program must be present for the interview/presentation. The presentation will be followed by a question and answer period by the selection team. IWVGA will conduct interviews by conference call and screen sharing, and/or in face-to-face meetings based on the availability of the Proposer selected for interviews. IWVGA will not discriminate against any interested firm or individual on the grounds of race, creed, color, sex, age, disability, or national origin in the contract award. IWVGA reserves the right to reject any and all proposals at its discretion, thus not awarding the contract to any firm. IWVGA reserves the right to modify this RFP or the criteria for selection in any manner, to cancel this RFP, or to reject any one or more or all submittals.

IWVGA retains sole discretion to evaluate proposals and make an award to the Proposer that IWVGA deems to have the most responsive proposal. IWVGA reserves the right to invite the top candidate(s) for an oral interview, or to request additional clarifying information. The firm with the highest rating may be invited to negotiate a final agreement. If an agreement is not reached, negotiations may be terminated and commenced with the next most qualified firm. The recommendation of IWVGA shall be submitted to the IWVGA Board for award of contract.

Upon the approval of the IWVGA Board, IWVGA will issue the Notice of Award and deliver the signed contract to the awarded Proposer.

B. Selection Criteria

IWVGA will select the most qualified proposal based on the following factors.

1. Relevant qualifications and experience for implementation and operation of comparable water audit, leak detection and repair programs based on but not limited to the following:

- Strength and stability of the firm and any subcontractors
- Provide data on the level of experience in specific contracts of this type including performance and abilities (minimum of 3 examples) in addition to listing a minimum of three references
- Qualifications, education, technical competence, licensing, and experience of the firm's staff and subcontractors assigned to the project
- Key personnel's level of involvement in performing related work and or close oversight
- Adequacy of labor commitment
- Demonstrated knowledge of the scope of work required, capability of performing specific tasks outlined in the RFP based on similar work experience
- Provided samples of craftsmanship and quality of work for other similar projects

2. Conceptual and proposed solutions and past performance on comparable engagements. The proposal must clearly indicate that the submitter has performed adequate planning to accomplish the tasks as defined in the Scope of Work.

- It must be logical and laid out in a clear and thoughtful manner
- Proposal includes a complete plan to accomplish the requirements, including subcontracting
- Plan demonstrates that appropriate personnel and equipment will be positioned efficiently to carry out the requirements
- Innovative approaches and ideas, specific methods and techniques to be employed by the contractor
- Considerate of time constraints within the job
- Meets all applicable guidelines as set forth in the RFP.

3. Ability to provide appropriate Safety Measures.

- Comply with Occupational Safety and Health Administration (OSHA) requirements and applicable laws, ordinances, rules, regulations and orders
- Provided an Injury and Illness Prevention Program (IIPP)
- Demonstrated that they do not have a serious or willful OSHA violation in the last 5 years

4. Total Program Cost, while not determinative, may be considered in the selection process. The selected firm will be expected to maintain the proposed billing rates throughout the term of the contract.

- Value provided
- Reasonableness of the hourly rates, labor hours, and fees required to perform the work in relation to the scope of work and other proposals received, as well as reasonableness based on project costs for recently completed projects of similar scope and size. Consider travel time, if applicable, when evaluating reasonableness of rates
- Responsiveness to RFP and exceptions to or deviations from the RFP requirements
- The total fee for non-optional and optional tasks will be judged for value and used as the basis of comparison between the proposals submitted
- Quality of materials used

5. Willingness to Comply with the Proposed Agreement Terms. A sample agreement is attached as Attachments B. Proposals will be rated based on the exceptions taken to the proposed contract.

V. Conditions of Request

A. General Conditions

IWVGA reserves the right to cancel or reject all or a portion or portions of the request for proposals without notice. Further, IWVGA makes no representations that any agreement will be awarded to any organization submitting a proposal. IWVGA reserves the right to reject any and all proposals submitted

in response to this request or any addenda thereto. Any changes to the proposal requirements will be made by written addendum.

B. Limitations

All reports and pertinent data or materials shall be the sole property of the IWVGA, and may not be used or reproduced in any form without the explicit written permission of IWVGA. IWVGA reserves the right to extend the time allotted for the proposal, to verbally examine the Proposer in person, request copies of previous work prepared by the consultant, and to request a best and final offer, should IWVGA deem that it is in its best interests to do so.

This RFP does not commit IWVGA to award a contract, or to pay any costs incurred in the preparation of the proposal. IWVGA reserves the right to accept or reject any or all proposals received as a result of this request, to negotiate with any qualified consultant, or to cancel this request in part or in its entirety. IWVGA may require the selected consultant to participate in negotiations and to submit such technical, price, or other revisions of their proposals as may result from negotiations. IWVGA reserves the right to negotiate all final terms and conditions of any contract entered into.

C. Liability of Costs and Responsibility

IWVGA shall not be liable for any costs incurred in response to this request for proposals. All costs shall be borne by the person or organization responding to the request. Proposers are liable for all errors and omissions contained in their proposals. The person or organization responding to the request shall hold IWVGA harmless from any and all liability, claim or expense whatsoever incurred by or on behalf of that person or organization. All submitted material becomes the property of IWVGA.

The selected PA will be required to assume responsibility for all services offered in the proposal whether or not they possess them within their organization. The selected PA will be the sole point of contact with regard to contractual matters, including payment of any and all charges resulting from the contract.

D. Validity

The proposer agrees to be bound by its proposal for a period of ninety (90) days commencing **June __, 2018**, during which time IWVGA may request clarification or correction of the proposal for the purpose of evaluation. Amendments or clarifications shall not affect the remainder of the proposal, but only that portion so amended or clarified.

E. Standard Contractor Agreement

A sample contractor agreement has been provided in Attachments B for the proposer's review and comment. If a proposer wishes to take exception to any of the terms and conditions contained in the standard contractor agreement, these should be identified specifically; otherwise it will be assumed that the proposer is willing to enter into the agreement as it is written. Failure to identify contractual issues of dispute can later be the basis for IWVGA disqualifying a proposer.

Any exceptions to terms, conditions, or other requirements must be clearly stated. Otherwise, IWVGA will consider that all items offered are in strict compliance with the RFP, and the successful proposer will be responsible for compliance. IWVGA will consider such exceptions as part of the evaluation process which may constitute the sole grounds for rejection of the proposal. The contractor agreement will not be executed by IWVGA without first being signed by the proposer.

F. Permits and Licenses

Proposer, and all of proposer's subcontractor, at its and/or their sole expense, shall obtain and maintain during the term of any agreement, all appropriate permits, certificates and licenses including, but not limited to, a City Business License which will be required in connection with the performance of services hereunder.

G. Oral and Written Explanations

IWVGA shall not be bound by oral explanations or instructions given at any time during the process or after the award. Oral explanations given during the review process and after award become binding when confirmed in writing by an authorized IWVGA official. Written responses to question(s) asked by one proposer will be provided to all proposers who received Requests for Proposals.

H. Proposer's Representative

The person signing the proposal must be a legal representative of the firm authorized to bind the firm to an agreement in the event of the award.

I. Deliverables

Deliverables depend upon the task assigned. In general, 2 copies of administrative draft reports are required upon completion of each task. Following approval by the staff, 3 copies of each final report are required. One unbound copy of each final document and an electronic file containing all final documents and all information are to be provided. The consultant will develop a system to assemble, organize, store and utilize data in an electronic format. At the outset of the agreement, the consultant will submit a description of the software to be used in preparation of the reports and graphics.

J. Insurance

General Liability, Automobile, Professional Liability, and Worker's compensation insurance are required in the amount set forth in the attached sample contractor agreement.

ATTACHMENT A

SCOPE OF SERVICES

FOR

WATER AUDIT, LEAK DETECTION AND LEAK REPAIR PROGRAM

1. Provide Phase 1 – Water Audit Services:

- a. Review accounting to identify, quantify, and verify water and revenue losses within the SDACs of Inyokern and China Lake Acres.
- b. Perform an “Initial” water audit that consists of a system-wide accounting of all water into and out of the water distribution system over a specific time period (minimum over a one-year period). The water quantified in the audit shall include the following:
 - i. Water Added to the System – quantity of water produced by the water agency and the quantity of water imported to the system from other sources
 - ii. Authorized Water Consumption including:
 - Billed authorized consumption
 - o Billed metered consumption
 - o Billed exported consumption
 - o Billed unmetered consumption
 - Unbilled authorized consumption (including firefighting and training, flushing of water mains, street cleaning, landscape irrigation of public areas and streets, and water consumption at public buildings)
 - o Unbilled meter consumption
 - o Unbilled unmetered consumption
 - iii. Water Losses determined from the difference between the amount of water added to the System and the amount of authorized water consumption, which could consist of “Apparent Losses” and “Real Losses”
 - Apparent Losses include unauthorized consumption, customer metering inaccuracies, and billing errors and adjustments
 - Real Losses include leakage on water mains, leakage and overflow at storage tanks, and leakage on service lines to the water meters. “Real Losses” are determined by subtracting “Apparent Losses” from the water losses
- c. Following completion of “Initial” water audit, provide recommendation to IWVGA on whether a more focused audit should be conducted to improve any initial estimates of water losses

2. Phase 2 – Leak Detection and Repair Program Services:

The selected Contractor (“Contractor”) shall provide all instruments, equipment, tools, personnel, and supervision required to perform leak surveys of the SDACs of Inyokern’s and China Lake Acres’s potable water distribution systems, including but not limited to the following tasks:

- a. Become familiar with the potable by reviewing IWVGA-provided maps of the pipe networks and available appurtenances to be used for contact points. In some cases, only a general location of individual service lines is known
- b. Locate leaks in the water distribution systems. All equipment shall be operated by trained personnel experienced in performing the services required under this contract.
- c. Classify each leak, as follows:
 - i. Class 1. Any leak which is hazardous in terms of potential undermining, possibly resulting in surface collapse, encroachment and/or damage to nearby utilities, commercial or private properties or leaks severe enough to warrant immediate repair. These leaks are to be reported to the IWVGA immediately
 - ii. Class 2. Any leak that displays water loss significant enough to be monitored on a regular repair schedule
 - iii. Class 3. Small leaks which should be repaired as workload permits.
- d. Furnish a daily report to IWVGA's project manager which includes the classifications and locations of leaks detected, estimated gallons per minute (gpm) loss and area covered. The format and design of any and all reports will be discussed with Contractor after Notice of Award, and shall be approved by IWVGA prior to start of work
- e. Furnish a written report within fifteen days of survey completion, including:
 - i. A summary of survey findings, including footage covered, estimated gpm water loss, quantity and types of leaks found, and recommendations for water distribution system improvement
 - ii. Area survey reports indicating pipe line areas covered, amount and type of contact points used, leak sound locations with decibel levels, approximate time spent and observations of water system irregularities
 - iii. A detailed drawing showing the following information for each leak detected during survey: location, type of leak, leak classification, estimate of gpm loss, cover type, whether or not location was marked, and computer justification when applicable
 - iv. The format and design of any and all reports will be discussed with Contractor after Notice of Award, and shall be approved by IWVGA prior to start of work
- f. If a detected leak is repaired by the utility prior to Contractor's completion of field work, Contractor shall re-survey that section to ensure that no extremely quiet leaks were missed due to a particularly noisy leak or other variable.
- g. Work shall be conducted on weekdays (Monday through Friday) between the hours of 7 a.m. and 5 p.m. Any work required outside this schedule shall be approved in advance by IWVGA's Project Manager. All work shall be conducted in accordance with the latest edition of the Manual on Uniform Traffic Control Devices published by the Federal Highway Commission ("MUTCD")
- h. If requested, pinpointing leaks in private lines under this contract will be required as directed by the IWVGA.
- i. A narrative statement that describes proposer's methodology and approach to performing services, including, at a minimum, the following information:
 - i. Proposer's overall approach to the project.

- ii. A list of equipment and/or instruments which will be used in the performance of the required services and their purpose
 - iii. How proposer will determine the distance sounds travel in various pipe materials, pipe sizes and pressure zones in each area of the system
 - iv. The process proposer will employ if normal contact points are not available or cannot be created within a reasonable distance
 - v. Under what circumstances nighttime work might be required
 - vi. An explanation of all IWVGA support, if any, required by proposer in the performance of the services, including IWVGA personnel, equipment, information, services, etc.
- j. Provide on-going support to IWVGA for quarterly invoicing and reporting to Department of Water Resources

Indian Wells Valley Groundwater Association
DRI Proposal for Prop 1 Funded Support of GSP Development
April 27, 2018

Task 1 - Sustainable Management Alternatives through 2070

The calibrated groundwater model will be setup to simulate up to four (4) sustainable management alternative simulations through 2070. The sustainable management alternatives will be provided by the Technical Advisory Committee (TAC). Results will be presented as maps of drawdown in Indian Wells Valley, hydrographs at specific locations, and annual water budget tables for the basin and each management area including pumping by water use. The management area extents would be provided by the TAC and/or the Water Resource Manager (WRM) and would probably include 3 to 5 zones.

The personnel cost for this task is \$24,570.

Task 2 - Transport (Salinity) Model Scenario

A predictive simulation for TDS transport will be developed for the preferred sustainable management alternative. The transport model will be based on the published transport model but implemented on the updated model platform including additional salinity data if readily available. The transport and subsidence simulations will extend through 2070 and results will be presented as maps of TDS concentrations, concentrations through time at selected locations, and annual mass balance tables by management area for the preferred alternative.

The personnel cost for this task is \$23,514.

Task 3a – Attendance and Participation at TAC Meetings

DRI (generally Greg Pohll) will attend and participate in six (6) TAC meetings. Beyond general attendance and participation and discussions, DRI will present model calibration results, including baseline model assumptions, seasonally varying and constant boundary conditions, water budgets, and results of the steady-state, transient historical, and four (4) sustainable management alternatives, and TDS transport results.

Travel cost for this task is \$7,118 and personnel cost is \$35,920. Total cost for this task is \$43,038.

Task 3b – Attendance and Participation at TAC Workshop

Jenny Chapman and Greg Pohll will prepare for and lead a 4-hour workshop for an ad hoc (3 member) committee from the TAC. DRI will collaborate with the Water Resource Manager (WRM) and the Navy for additional content. DRI will provide detailed information regarding model calibration results (steady-state and transient), model assumptions, seasonally varying recharge and pumping, and other boundary conditions, and water budgets. In addition, DRI will provide summary slides to the ad hoc committee and the full TAC following the workshop.

Travel cost for this task is \$2,204 and personnel cost is \$12,552. Total cost for this task is \$14,756.

Task 4 – Coordination with the Water Resource Manager

This task will include ongoing coordination with the WRM. WRM support would include discussions, providing input, developing data tables, GIS locations and maps, etc. Other items will be coordinated within the limits of the budget. DRI will also collaborate with the WRM to provide response to modeling comments from TAC, GSA Board, California Department of Water Resources (DWR), and the general public.

This task does not include travel and personnel cost is \$15,641.

Task 5 – Model Documentation

DRI will prepare a report that describes updates of the groundwater model since the last report. Updates will include changes made to the model since the last published report. Changes will include model re-calibration results, alterations to seasonally varying and constant boundary conditions, water budgets, and results of the steady-state, transient historical, and four (4) sustainable management alternatives, and TDS transport results. This report is not intended to replace the first edition of the modeling report as it will focus on model updates.

Personnel cost for this task is \$55,284.

Total Project Cost

The total project cost is \$176,804.

DRI Cost Proposal

IWV Basin Model Coordination - Prop 1

1 June 2018 through 30 June 2020

Individual / Units		Rate,\$/hr	Hrs	Cost
SALARIES & WAGES				
Professional				
S020 Environmental Scientist	C. Garner	106.70	382	40,760
Subject Matter Expert	J. Chapman	237.98	147	34,984
Subject Matter Expert	G. Pohl	231.66	396	91,737
SUBTOTAL SALARY AND WAGES			925	167,481
TRAVEL				
Ridgecrest, CA - Meetings or Field Work				
China Lake - DRI Vehicle				
Lodging				
Meals/Incidental expenses				
SUBTOTAL TRAVEL				
TOTAL COSTS				176,804

Model Sustainable Management Alternatives 2070		Transport Model Scenario		TAC Meetings		TAC Workshops		Coordination/Discussions with WRM		Model Documentation	
Task 1		Task 2		Task 3a		Task 3b		Task 4		Task 5	
Hrs	Cost, \$	Hrs	Cost, \$	Hrs	Cost, \$	Hrs	Cost, \$	Hrs	Cost, \$	Hrs	Cost, \$
100	10,670	80	8,536	24	2,561	12	1,280	0	0	166	17,713
0	0	24	5,712	0	0	24	5,712	19	4,522	80	19,039
60	13,900	40	9,266	144	33,359	24	5,560	48	11,120	80	18,533
160	24,570	144	23,514	168	35,920	60	12,552	67	15,641	326	55,284
	0		0		3,386		960		0	0	0
	0		0		1,980		660		0	0	0
	0		0		1,752		584		0	0	0
	0		0		7,118		2,204		0	0	0
	24,570		23,514		43,038		14,756		15,641		55,284

All costs are fully burdened in accordance with DRI's standard business practice.

Indian Wells Valley Groundwater Association
DRI Proposal for Full Support of GSP Development

April 27, 2018

Task 1 - Sustainable Management Alternatives through 2070

The calibrated groundwater model will be setup to simulate up to four (4) sustainable management alternative simulations through 2070. The sustainable management alternatives will be provided by the Technical Advisory Committee (TAC). Results will be presented as maps of drawdown in Indian Wells Valley, hydrographs at specific locations, and annual water budget tables for the basin and each management area including pumping by water use. The management area extents would be provided by the TAC and/or the Water Resource Manager (WRM) and would probably include 3 to 5 zones.

The personnel cost for this task is \$24,570.

Task 2 - Transport (Salinity) and Land Subsidence

A predictive simulation for TDS transport and land subsidence will be developed for the preferred sustainable management alternative. The transport model will be based on the published transport model but implemented on the updated model platform including additional salinity data if readily available. A revised conceptual model of land subsidence will be developed and integrated into the subsidence model framework. The transport and subsidence simulations will extend through 2070 and results will be presented as maps of TDS concentrations, concentrations through time at selected locations, and annual mass balance tables by management area for the preferred alternative.

The personnel cost for this task is \$36,498.

Task 3a – Attendance and Participation at TAC Meetings

DRI will attend and participate in eight (8) TAC meetings. Beyond general attendance and participation and discussions, DRI will present model calibration results, including baseline model assumptions, seasonally varying and constant boundary conditions, water budgets, and results of the steady-state, transient historical, and four (4) sustainable management alternatives, and TDS transport results.

Travel cost for this task is \$9,154 and personnel cost is \$47,343. Total cost for this task is \$56,497.

Task 3b – Attendance and Participation at TAC Workshop

Jenny Chapman and Greg Pohll will prepare for and lead two (2) 4-hour workshops for an ad hoc (3 member) committee from the TAC. DRI will collaborate with the WRM and the Navy for additional content. DRI will provide detailed information regarding model calibration results (steady-state and transient), model assumptions, seasonally varying recharge and pumping, and other boundary conditions, and water budgets. In addition, DRI will provide summary slides to the ad hoc committee and the full TAC following each workshop.

Travel cost for this task is \$4,409 and personnel cost is \$25,104. Total cost for this task is \$29,513.

Task 4 – Coordination with the Water Resource Manager

This task will include ongoing coordination with the WRM. WRM support would include discussions, providing input, developing data tables, GIS locations and maps, etc. Other items that will be coordinated include a review of existing (and brackish water study) hydrogeologic conceptual models, development of sustainable water balance, development of monitoring plan, identification of data gaps, development of sustainable management criteria, providing tables and descriptions for GSP model section documentation, discussions regarding climate change, land use, potential recharge areas, and other management alternatives. DRI will also collaborate with the WRM to provide response to modeling comments from TAC, GSA Board, California Department of Water Resources (DWR), and the general public.

This task does not include travel and personnel cost is \$37,572.

Task 5 – Model Documentation

DRI will prepare a report that describes updates of the groundwater model since the last report. Updates will include changes made to the model since the last published report. Changes will include model re-calibration results, alterations to seasonally varying and constant boundary conditions, water budgets, and results of the steady-state, transient historical, and four (4) sustainable management alternatives, and TDS transport results. This report is not intended to replace the first edition of the modeling report as it will focus on model updates.

Personnel cost for this task is \$55,284.

Total Project Cost

The total project cost is \$239,934.

DRI Cost Proposal

IWV Basin Model Coordination - FULL PROPOSAL

1 June 2018 through 30 June 2020

Individual / Units		Rate,\$/hr	Hrs	Cost
SALARIES & WAGES				
Professional				
S020 Environmental Scientist	C. Garner	106.70	480	51,217
Subject Matter Expert	J. Chapman	237.98	296	70,443
Subject Matter Expert	G. Pohll	231.66	452	104,710
SUBTOTAL PERSONNEL			1,228	226,371
TRAVEL				
Ridgecrest, CA - Meetings or Field Work				
China Lake - DRI Vehicle				
Lodging				
Meals/Incidental expenses				
SUBTOTAL TRAVEL				
TOTAL COSTS				239,934

Model Sustainable Management Alternatives 2070		Model Transport and Land Subsidence		TAC Meetings		TAC Workshops		Coordination/Discussions with WRM		Model Documentation	
Task 1		Task 2		Task 3a		Task 3b		Task 4		Task 5	
Hrs	Cost, \$	Hrs	Cost, \$	Hrs	Cost, \$	Hrs	Cost, \$	Hrs	Cost, \$	Hrs	Cost, \$
100	10,670	166	17,713	24	2,561	24	2,561	0	0	166	17,713
0	0	40	9,519	48	11,423	48	11,423	80	19,039	80	19,039
60	13,900	40	9,266	144	33,359	48	11,120	80	18,533	80	18,533
160	24,570	246	36,498	216	47,343	120	25,104	160	37,572	326	55,284
	0		0		4,178		1,921	0	0	0	0
	0		0		2,640		1,320	0	0	0	0
	0		0		2,336		1,168	0	0	0	0
	0		0		9,154		4,409		0		0
	24,570		36,498		56,497		29,513		37,572		55,284

All costs are fully burdened in accordance with DRI's standard business practice.



Technical Support Services for Groundwater Sustainability Plan Development

The Department of Water Resources' (DWR) Technical Support Services (TSS) supports Groundwater Sustainability Agencies (GSAs) as they develop their Groundwater Sustainability Plans (GSPs). The goal is to provide technical services as well as [data and tools](#)¹ to GSAs at both regional and statewide scales to build the capacity needed to achieve sustainability. TSS is available to GSAs through DWR Region Offices and/or contractors upon DWR funding availability. The initial priority for this funding will be focused on requests in critically over-drafted and high- and medium-priority basins.

Technical Support Services Available:

Field Activities

- Monitoring Well Installation
 - Geophysical Logging
 - Geologic Logging
- Groundwater Level Monitoring Training
- Downhole Video Logging
- Other Field Activities

Modeling

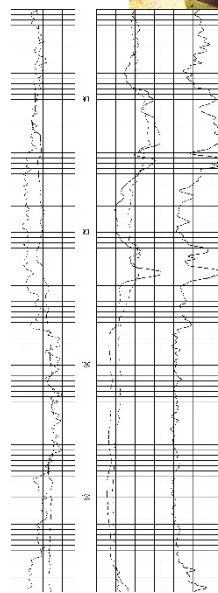
- Modeling Training and Support (pending DWR updated model release)

Who is Eligible?

GSAs developing GSPs are eligible to apply for these services if they agree to meet all of the following obligations:

- Agree to share any data generated from the technical support service(s) with DWR and the public.
- Comply with all applicable laws related to the technical support service(s).
- Agree to work in an open, inclusive, and collaborative manner toward the development of a GSP, including appointing a coordinator for the basin to represent all GSAs, resolve disputes, and speak as one voice to DWR (not required to be the "Point-of-Contact" for

Coordination Agreements as used in 23 CCR §357.4 (b) (1) of the GSP Emergency Regulations, or the "Plan manager" as used in 23 CCR §351 (z), 353.4 (b), and §354.6 (c)).



¹For additional information on DWR's Technical Support Services and other assistance offerings visit, <https://www.water.ca.gov/Programs/Groundwater-Management/Assistance-and-Engagement>

- Agree to complete GSA's responsibilities related to requested technical support service(s) within the defined timeframe.
- Support DWR staff or contractors that are providing technical support service(s).

Application Process

Applications for TSS will be evaluated on a continuous basis as funding allows.

Applications must be submitted through an online application system made available to the applicant following consultation with DWR Region Offices. **A PDF and Word copy of the application** are provided as a resource to help applicants prepare for the online application.

Applicants are encouraged to contact a Regional Office Coordinator at sgma_rc@water.ca.gov to discuss the type and level of services needed prior to submitting an application.

The image shows a screenshot of the 'I. Applicant Background' section of a TSS General Application form. The form includes questions 1 through 4, with question 1 asking to select a groundwater basin/subbasin. Below the form, there is a graph showing 'Groundwater Depth (Feet, MSL)' on the y-axis (ranging from 100 to 170) and 'Date' on the x-axis (ranging from 2/1/14 to 2/1/17). The graph displays several data series: 'Well 5 - Unremediated' (red line), 'Well 5 - Cont. by B4' (blue line), 'Well 5 - Cont. by SBA' (green line), 'Well 5 - Cont. by GSA' (black line), 'BICD 34' (orange line), and 'BICD 58' (purple line). The graph shows fluctuations in groundwater depth over time, with a notable dip around 2015. To the right of the graph is a detailed technical report titled 'MET COMPLETION REPORT' with various tables and charts.



California Department of Water Resources
1416 Ninth Street
P.O. Box 942836 Sacramento,
CA 94236-0001

<http://www.water.ca.gov>

¹For additional information on DWR's Technical Support Services and other assistance offerings visit, <https://www.water.ca.gov/Programs/Groundwater-Management/Assistance-and-Engagement>

Recycled Water Opportunities and Constraints Evaluation

Indian Wells Valley Groundwater Authority
Technical Advisory Committee Meeting

May 3, 2018

Stetson Engineers Inc.

Outline

- ▶ Ridgecrest WWTP
 - ▶ Current and historic flow
 - ▶ Habitat requirements
 - ▶ Quantification
- ▶ Potential sewer collection systems
- ▶ Non-Potable Reuse
- ▶ Indirect Potable Reuse
 - ▶ Geologic conditions
 - ▶ Water Quality
 - ▶ Conclusions
- ▶ Direct Potable Reuse
 - ▶ Costs of treatment
- ▶ Preliminary Prioritization of Recycled Water Projects
- ▶ Next Steps

Ridgecrest WWTP

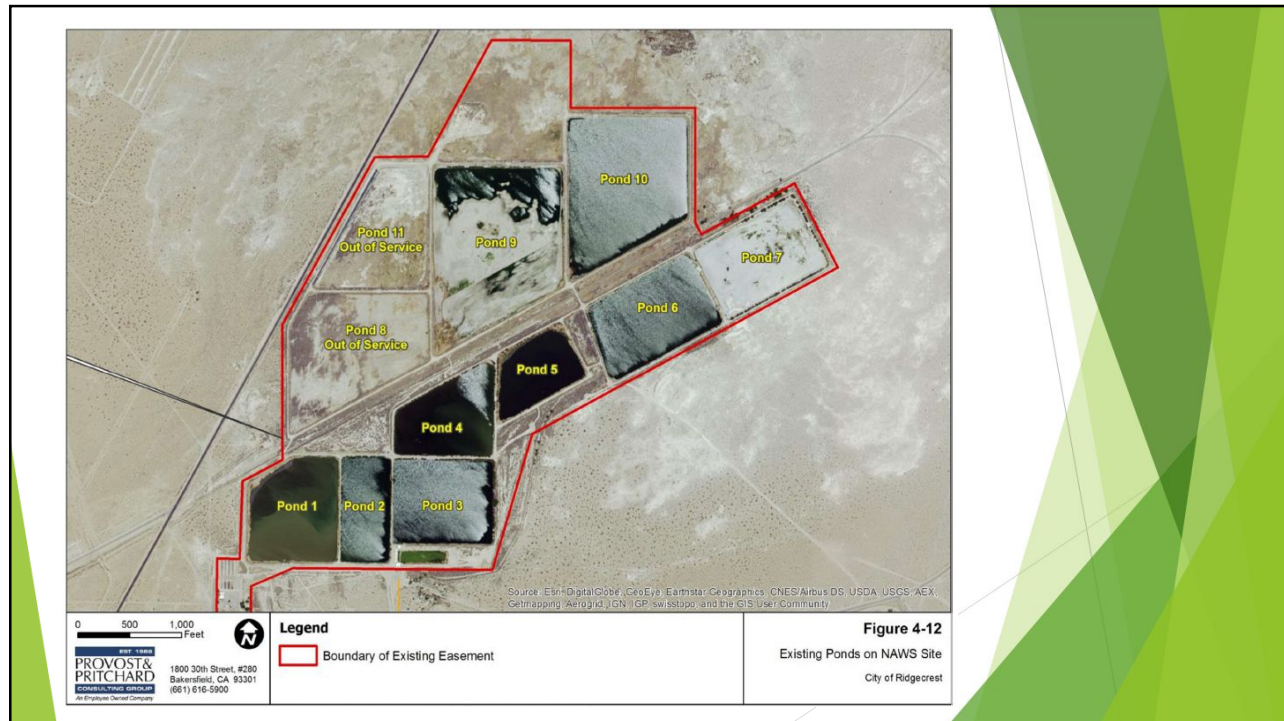
Year	Average Annual Flow (AFY)	
	Ridgecrest Public Works	Provost & Pritchard
2001	-	2,823
2002	-	2,800
2003	-	2,890
2004	-	2,823
2005	-	2,812
2006	-	2,879
2007	2,790	2,789
2008	2,893	2,879
2009	2,852	2,856
2010	2,936	2,935
2011	2,936	2,756
2012	2,803	2,800
2013	2,582	2,576
2014	2,598	2,588
2015	2,437	-
2016	2,529	-
2017	2,739	-

Ridgecrest WWTP

- ▶ 1993 Memorandum of Agreement between Navy and City of Ridgecrest
 - ▶ Ensures that treated effluent of appropriate quality and quantity are available, through pond seepage from Ponds 9 and 10, to Tui Chub habitat
 - ▶ 630 AFY of total pond percolation in 2010, some of which emerged as seepage for the habitat¹
 - ▶ Ponds 9 and 10: 72 total acres²
 - ▶ Percolation rate of 0.23 inches per day (7.0 feet per year)²
 - ▶ Estimated total percolation to habitat: 72 acres * 7.0 feet per year = 504 AFY
 - ▶ To be confirmed with Navy hydrogeologists

¹⁾ Todd Report, 2014.

²⁾ Provost & Pritchard, Wastewater Treatment Plant Facility Plan, 2015.



Ridgecrest WWTP

- ▶ Quantification of available recycled water
 - ▶ 2017 total generated effluent: **2,739 Acre-feet per year (AFY)**
 - ▶ Navy golf course irrigation: 500 AFY
 - ▶ City alfalfa irrigation: 220 AFY
 - ▶ Assumed percolation to habitat: 504 AFY
 - ▶ Total available recycled water: **1,515 AFY**
 - ▶ 1.35 MGD

2,739 AFY
-500 AFY
-220 AFY
-504 AFY
1,515 AFY

Ridgecrest WWTP

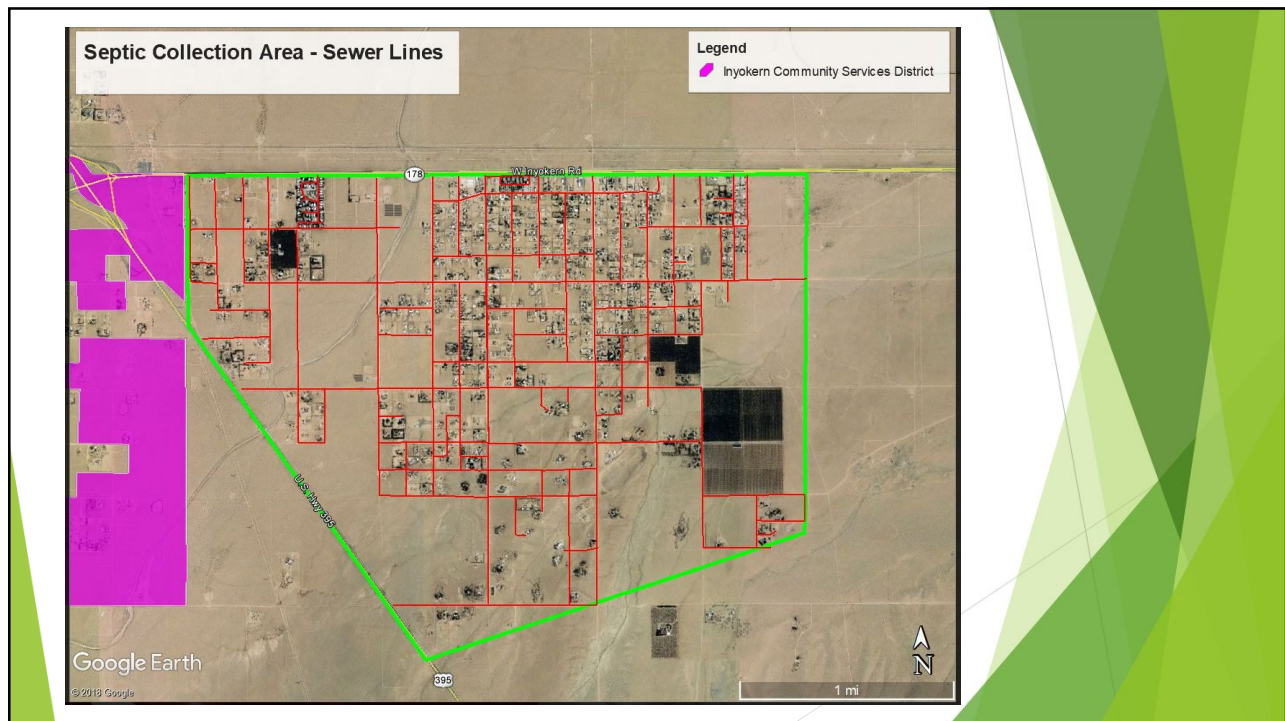
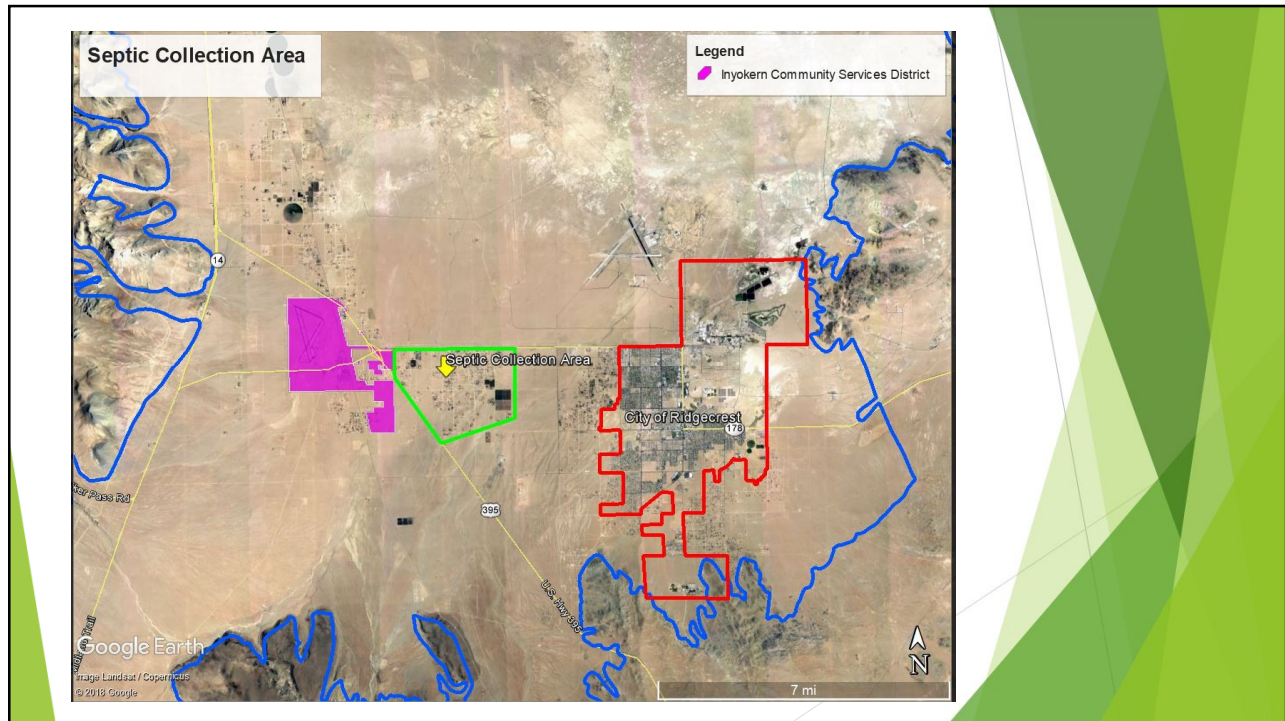
- ▶ Recommended upgrades to treatment system (from Provost & Pritchard, 2015):
 - ▶ Secondary treatment: oxidation ditches and circular clarifiers
 - ▶ RAS feed for nitrogen removal
 - ▶ New percolation and evaporation ponds located at the City site for effluent disposal
 - ▶ Partial tertiary treatment: Cloth media filtration and chlorine disinfection (liquid NaOCl)
 - ▶ Tertiary-treated water will be stored in a 1.8 MG storage tank
 - ▶ Booster pump station for conveyance into a purple pipe distribution system
 - ▶ Aerobic digester and mechanical biosolids dewatering
 - ▶ Majority of dewatered solids to be sent to an approved landfill; partial disposal at the City alfalfa fields.

Septic Systems

- ▶ Potential Collection System
 - ▶ 1,260 parcels identified within potential collection area¹
 - ▶ Approximately 725 residences assumed to have septic systems (via Google Earth)
 - ▶ Each septic system assumed to produce 263 gallons of sewage per day²
 - ▶ Estimated annual available sewage: 69,596,375 gallons per year
 - ▶ 214 AFY available for collection

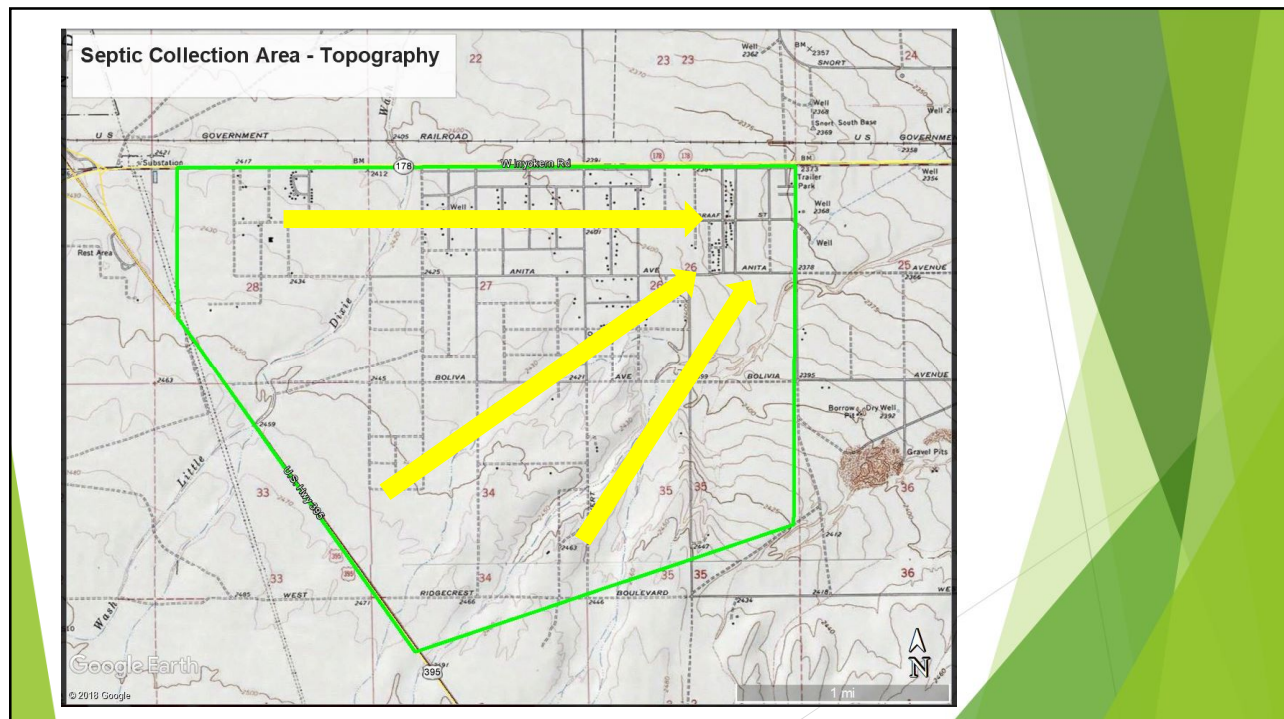
¹) Kern County Online Mapping.
<http://maps.co.kern.ca.us/H5/Index.html?configBase=http://maps.co.kern.ca.us/Geocortex/Essentials/REST/sites/KernEssentialsPub/viewers/KernGISPubH/virtualdirectory/Resources/Config/Default>

²) Indian Wells Valley Water District, *Salt and Nutrient Management Plan*, 2018.



Septic Systems

- ▶ Infrastructure
 - ▶ Sewer Lines: 42 miles
 - ▶ Collection area
 - ▶ Lowest elevation (~2,380 feet amsl) occurs in the northeast corner of collection area
 - ▶ On-site treatment may be preferred (Primary, secondary, tertiary, and advanced treatment)
 - ▶ Ridgecrest WWTP is significantly lower in elevation (~2,215 feet amsl) but is also 6 miles away from the collection area.
 - ▶ Additional cost to re-pump WWTP effluent to Indirect Potable Reuse site in a separate 6-mile pipeline
- ▶ Reuse site
 - ▶ Deep injection wells
 - ▶ Monitoring wells

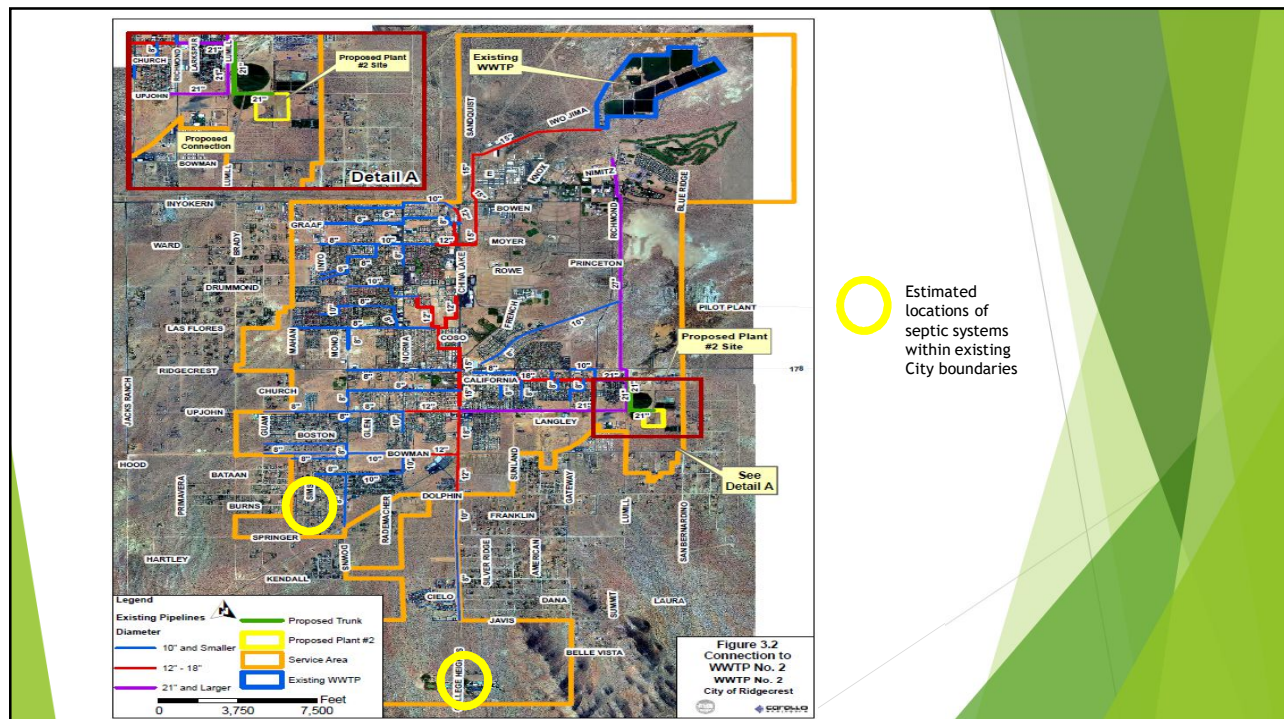


Septic Systems

- ▶ Expanding City of Ridgecrest sewer collection system
 - ▶ Potential locations for expansion
 - ▶ Dense urban area immediately west of existing City boundaries
 - ▶ 150 septic systems located within existing City boundaries¹
 - ▶ Cost estimated at \$15,000 per household²
 - ▶ Retrofits, connection to collection system
 - ▶ Expansion of sewer collection system relies on WWTP expansion to accommodate future increases in flow

1) Indian Wells Valley Water District, *Salt and Nutrient Management Plan*, 2018.

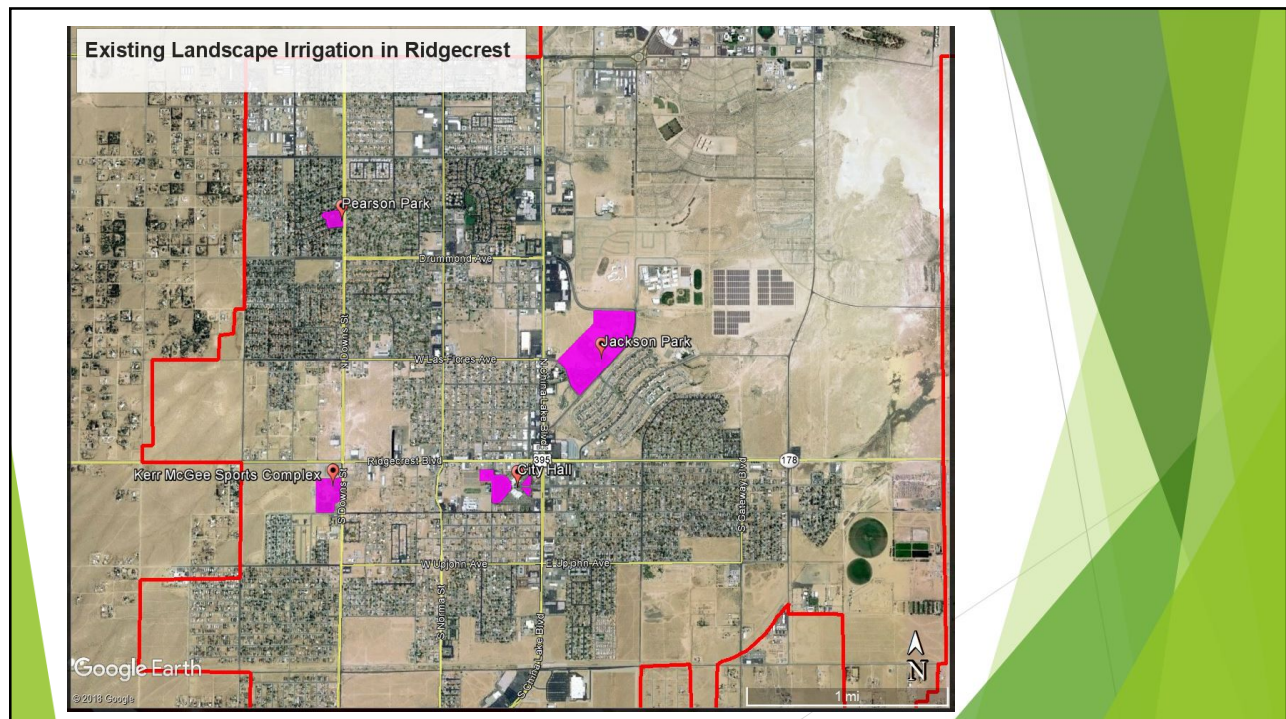
2) East Valley Water District, *Recycled Water Feasibility Study*, October 2014.



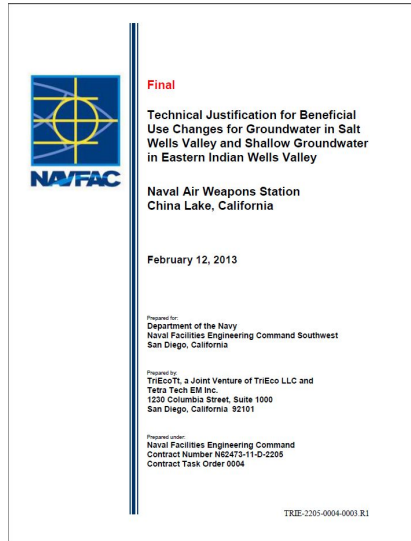
Non-Potable Reuse

- ▶ Replace groundwater use for existing landscape irrigation with recycled water
 - ▶ Avoid creating new water demands through new irrigation practices
- ▶ City of Ridgecrest currently operates five (5) wells to provide irrigation water for 41 acres of turf at:
 - ▶ City Hall
 - ▶ Pearson Park
 - ▶ Jackson Park
 - ▶ Kerr McGee Sports Complex
- ▶ Total irrigation water use of **320 AFY** (assuming an annual irrigation rate of 7.8 feet per year)¹
 - ▶ Seasonal and diurnal variance in water demands for landscape irrigation

¹ Todd Report, 2014.

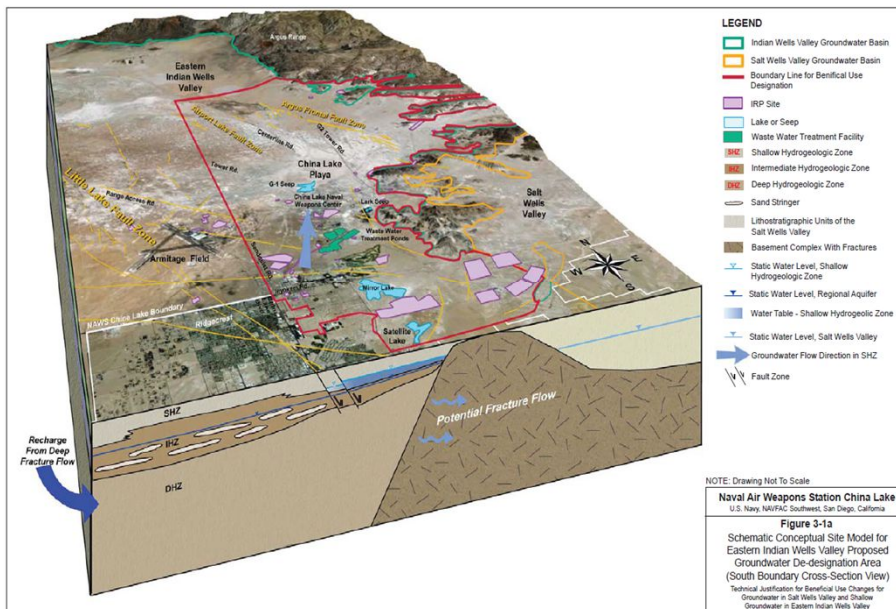


Indirect Potable Reuse

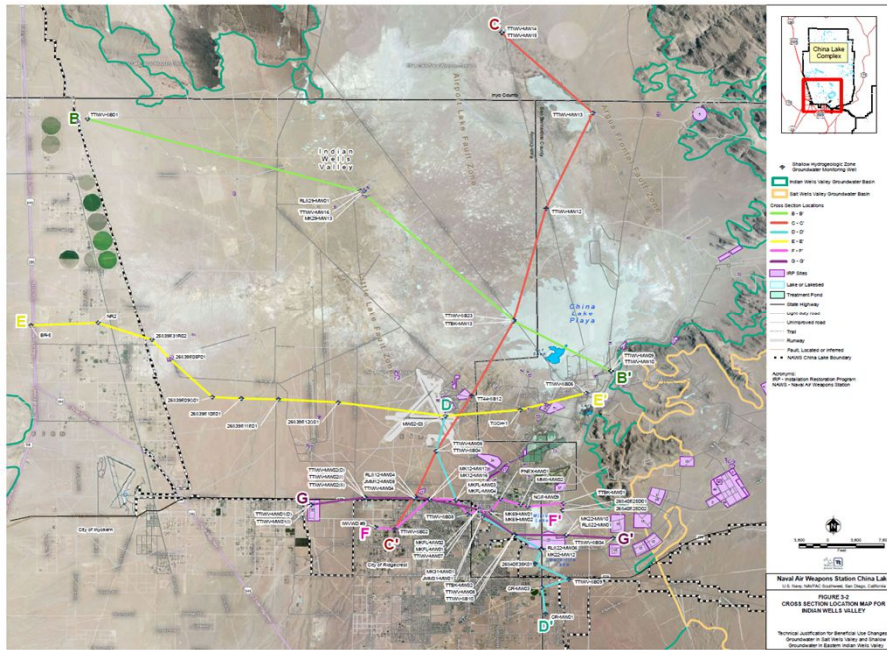


- ▶ “The SHZ is vertically separated from the regional [deep] aquifer by a continuous layer of thick lacustrine clays.”
- ▶ “To the east, groundwater in the SHZ is also horizontally bounded by bedrock.”
- ▶ “Groundwater flow between water-bearing zones in IWV appears to be minimal.”
- ▶ Current artificial sources of recharge (leakage from aqueducts and pipes, Ridgecrest WWTP ponds, and irrigation water) have greater influence on recharge to the SHZ.

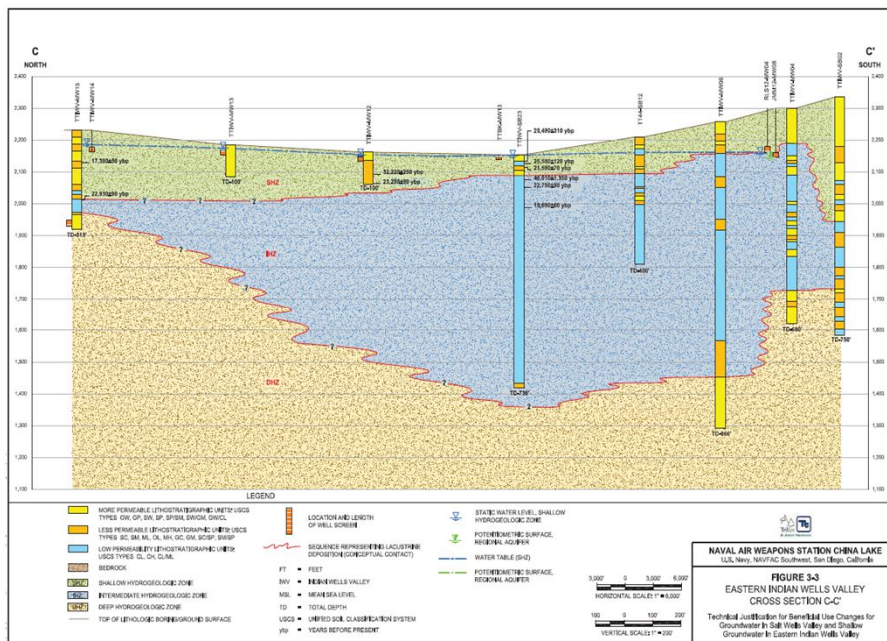
Schematic Conceptual Site Model for Eastern Indian Wells Valley Proposed Groundwater De-designation Area (South Boundary Cross-Section View)



Cross-Section Location Map for Indian Wells Valley



Cross-Section C-C'



Indirect Potable Reuse

► Water Quality

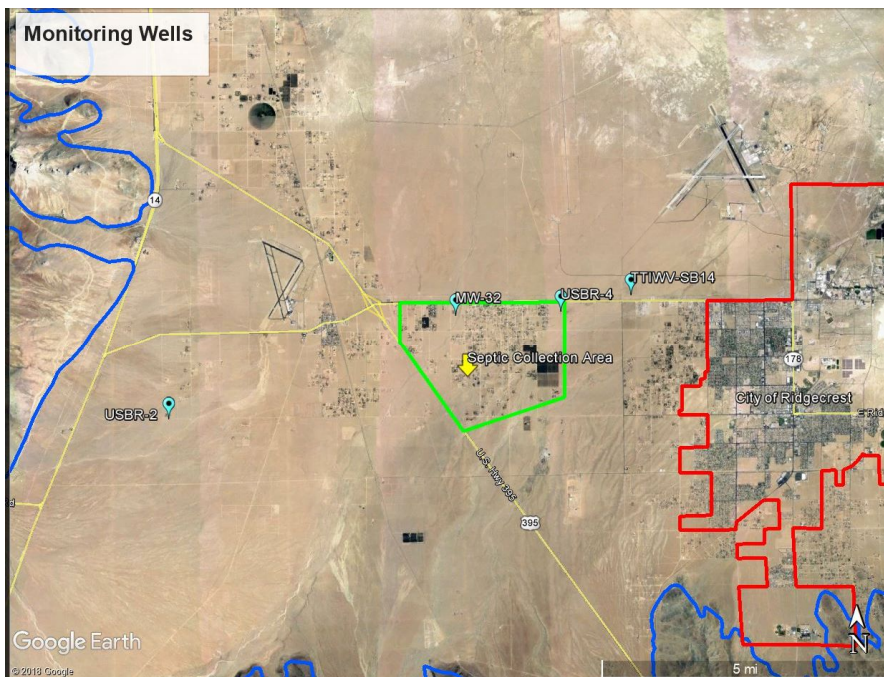
► Title 22 Primary Maximum Contaminant Levels (PMCL) and Secondary Maximum Contaminant Levels (SMCL)

- Total Dissolved Solids: SMCL of 500 mg/L
- Nitrate (as N): PMCL of 10 mg/L
- Arsenic: PMCL of 0.010 mg/L
- Sulfate: SMCL of 250 mg/L
- Chloride: SMCL of 250 mg/L

► Assimilative Capacity¹

- Average basin TDS concentration of 310 mg/L
 - Basin Plan WQ objective: SMCL of 500 mg/L → Assimilative capacity of 190 mg/L of TDS
- Average basin nitrate (as N) concentration of 0.70 mg/L
 - Basin Plan WQ objective: MCL of 10 mg/L → Assimilative capacity of 9.3 mg/L of nitrate (as N)
- Loading expected to increase over next 25 years from 310 mg/L to 446 mg/L for TDS and 0.70 mg/L to 1.05 mg/L for nitrate (as N)

¹ IWWVD Salt and Nutrient Management Plan, January 2018.



Indirect Potable Reuse

- Water Quality (December 2002): Monitoring well TTIWV-SB14 (MW02)¹

	MCLs	SHZ	IHZ	DHZ
TDS	500 mg/L (SMCL)	203 mg/L	235 mg/L	243 mg/L
Nitrate (as N)	10 mg/L (PMCL)	0.055 mg/L	0.097 mg/L	0.044 mg/L
Arsenic	0.010 mg/L (PMCL)	0.0062 mg/L	0.0037 mg/L	0.0087 mg/L
Sulfate	250 mg/L (SMCL)	7.1 mg/L	3.3 mg/L	12.3 mg/L
Chloride	250 mg/L (SMCL)	15.9 mg/L	7.7 mg/L	21.3 mg/L

¹⁾ Tetra Tech EM Inc. Final Basewide Hydrogeologic Characterization Summary Report, 2003.

Indirect Potable Reuse

- Latest Available Water Quality Data in the DHZ¹

	MCLs	USBR-2 (2004)	USBR-4 (2005)	MW-32 (2006)
TDS	500 mg/L (SMCL)	303 mg/L	200 mg/L	220 mg/L
Nitrate (as N)	10 mg/L (PMCL)	0.7 mg/L	0.2 mg/L	3.4 mg/L
Arsenic	0.010 mg/L (PMCL)	NA	NA	NA
Sulfate	250 mg/L (SMCL)	49 mg/L	3.2 mg/L	19 mg/L
Chloride	250 mg/L (SMCL)	6.7 mg/L	17 mg/L	18 mg/L

¹⁾ IWWVD Salt and Nutrient Management Plan, January 2018.

Indirect Potable Reuse

► Conclusions

- The presence of lacustrine clay layers in the IHZ prevent surface spreading from being effective in nearly all portions of the IWV basin.
- Minimal groundwater flow between water-bearing zones exists in the basin. Any Indirect Potable Reuse project will need to provide recharge directly into the principal aquifer (DHZ).
- Historic and current water quality results in the Western portion of the basin near Inyokern suggest that **deep injection** into the DHZ is possible in the Western basin and takes a higher priority over surface spreading.
 - Reverse osmosis and advanced oxidation
 - Monitoring wells

Direct Potable Reuse

► Pure Water San Diego

- Tertiary WWTP Effluent → Advanced Water Purification → Reservoir → Surface Water Treatment → Water Distribution System
- No surface water reservoir/treatment buffers available in IWV

Conceptual-Level Cost of Combined Process Advanced Treatment Facilities (1 MGD)^{1,2}

Combined Treatment Process	Capital Cost (\$)	Annual O&M Cost (\$)
MF-Ozone-RO (Ozone-MF-RO)	\$13,000,000	\$500,000

¹⁾ International Ozone Association. "Cost of Advanced Treatment in Water Reclamation." 2014.

²⁾ 1 MGD = 1,120 AFY

Prioritization

- 1) Non-Potable Reuse of Ridgecrest WWTP effluent at existing Ridgecrest landscape irrigation sites
- 2) Deep injection of Ridgecrest WWTP effluent in the Western portion of the basin
- 3) Deep injection of Inyokern WWTP effluent and treated septic collection effluent in the Western portion of the basin
- 4) Direct Potable Reuse (with State involvement)

Next Steps

- ▶ Fully-developed costs for:
 - ▶ Individual treatment stages
 - ▶ Monitoring well construction
 - ▶ Sewer collection system
- ▶ Full regulatory analysis of deep injection