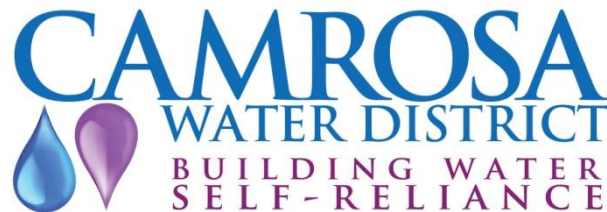


CAMROSA WATER DISTRICT

REQUEST FOR PROPOSALS FOR  
DESIGN SERVICES FOR PENNY WELL AIR  
ENTRAINMENT



June 29, 2021

Please submit letter proposal by July 29, 2021, by 4:00 PM to:

Camrosa Water District  
Mr. Terry Curson, District Engineer  
7385 Santa Rosa Road  
Camarillo, CA 93012

Please mark outside of envelopes – “Penny Well Air Entrainment”

# **CAMROSA WATER DISTRICT - SCOPE FOR PROFESSIONAL DESIGN SERVICES FOR THE PENNY WELL AIR ENTRAINMENT**

## **BACKGROUND & OVERVIEW:**

The Penny Well was drilled in March 1962 by Midway Drilling under Ventura County Public Works Agency (VCPWA) Permit No. R-723. The well was drilled using direct rotary method and completed with a 10-inch diameter steel casing installed to a depth of 464 feet. In July 1978, Midway Drilling installed a sanitary seal under VCPWA Permit the same permit number in order to comply with State regulations for municipal water supplies.

When the well was inspected in February 1985, most perforations appeared plugged, with the top 17 feet of perforations and a 7-foot section above 380 feet somewhat open. Deep pitting of the casing was observed near the bottom. As a result of unresolvable water quality issues, the well was taken off-line.

Originally, the Penny Well utilized a vertical turbine pump at the well site and a secondary booster pump station located approximately 250' to the east, known as the Snow Well site.

In August 2013, General Pump Company was contracted to perform some general well rehabilitation that included cleaning and test pumping to determine water quality and expected well yield. General Pump's report is included in Exhibit B.

In early 2014, design started on the installation of a new submersible 450 GPM pump, discharge piping, control valves, and an on-site chlorine generation facility (see Exhibit A). The site was put into service in late 2016. Mechanically the station operates as designed, but the well output contains entrained air that has resulted in customer complaints. The District has attempted to modify pumping rates, times, and duration to help alleviate and reduce these customer complaints with little or no success.

The District has preliminarily evaluated options to control air entrainment issues, from vortex and membrane degas separators to a simpler break-tank process. Camrosa is seeking a qualified consultant to investigate the cause of entrained air and further evaluate entrained air removal options, and/or provide other feasible alternatives, for selection by the District and design by the consultant.

## **Scope of Work for Professional Design Services for Penny Well Rehabilitation and Various Site Improvements:**

The wellhead and main facilities are located adjacent to the Arroyo Santa Rosa in two areas separated through two private residential easements. The main facility is located on property owned by the District that also provides access to trail easements for hikers and equestrians. In addition, the two private adjacent homeowners have access rights through the area. The site is small and there is very little usable space to incorporate additional equipment without causing access issues. Since the site is located adjacent to residential properties, facility size limitations, aesthetics, and sound issues must be considered and mitigated.

The District is seeking a consultant to provide a letter proposal that provides an overall evaluation of the existing well and equipment and provide long-term mitigation to remove entrained air. The proposed scope generally defines work needed to resolve the air entrainment issue and place the Penny Well back into full operational service, while eliminating entrained air within the adjacent distribution system.

Below is a general overview of suggested/expected design tasks required by the Consultant. Additional items the Consultant feels necessary should be included in their proposal listed as "Additional Task."

1. Request and Review all pertinent drawings, data, agreements, reports, and easement information;
2. Kick-off meeting, site visit (1), and progress meetings (2).
3. Existing utility research;
4. Provide surveying services (if necessary);
5. Provide geotechnical services (if necessary);
6. Develop a basic (letter style) design/technical memorandum. The technical memorandum is expected to be completed in two phases. Phase 1 would include evaluation and testing (as determined by consultant) of the well that determines the condition of the existing casing, screens, and pumping equipment to either confirm or rule-out any issues related to the well. Depending on the outcome of Phase 1, Phase 2 would evaluate and incorporate feasible solutions to repair/replace the well and/or incorporate entrained air removal equipment. A general overview for discussion is included below:
  - a. Evaluate existing design, including submersible pump installation, pump depth, water levels, casing perforations and overall size.
  - b. Pull pump and motor, evaluate casing and equipment, and perform any necessary testing and evaluation, by third-party, if necessary. (Pump and motor removal and videoing shall be coordinated and contracted through the District). Consultant is responsible for coordination, reviewing, evaluation, and incorporating findings into memorandum.
  - c. Provide general description and evaluation of hydraulic requirements required for altering existing submersible pump to meet equipment manufacturer and system hydraulic requirements.
  - d. Evaluate all pertinent information and make recommendations to include items that are not exclusively listed in this Scope of Work.
  - e. Evaluate and incorporate a writeup of two to three alternatives, describing the process, benefits, drawbacks, and any other descriptive information that would be helpful to the District towards making an informed decision.
  - f. Provide exhibits for the alternatives that include the general location of equipment, enclosures, sound mitigation, land acquisition, and preliminary budget cost estimate for each alternative.

7. Depending on the alternative selected by the District, the Consultant's project fee schedule should account for property acquisition services, including, but not limited to, exhibits and legal description and appraisal reports.
8. Coordinate with Ventura County Watershed Protection District regarding work within flood control jurisdiction.
9. Provide detailed plans in accordance with the District's standard size plan sheets using AutoCAD 2012 or back-compatible versions and reference to the District's standard plates. Plans shall include all above and below ground improvements and will be submitted at 50-percent, 90-percent, and 100-percent for review. Comments shall include, but not limited to:
  - a. General layout, notes, and details
  - b. Grading, earthwork, foundations, seismic requirements
  - c. Piping and mechanical
  - d. Electrical conduits, wires, controls, SCADA, alarms
  - e. Fencing, security
  - f. Sound attenuation and visual aesthetics
10. Provide technical specifications only in "Word" format.
11. Provide detailed Engineer's Cost Estimate for 90- and 100-percent drawings.
12. Provide separate cost line item for bidding services related to RFIs and attending pre-bid meeting.

### **Deliverables:**

Consultant shall provide a letter proposal outlining and detailing the above scope of work. The consultant shall break down the different tasks in a sufficient manner that identifies different design alternatives. Consultant shall list additional tasks not specifically mentioned but feels are necessary. The proposal should identify and provide a narrative for; project understanding, project team and qualifications, firm's experience, knowledge and experience with similar projects and approach to performing the work. The cost portion of the proposal should account for the different options and provide enough detail, flexibility, and task items to allow the District to negotiate and adjust the design costs, as necessary. The proposal should also include an estimated design schedule and any additional items with explanation the consultant feels may be necessary or convenient to the District.

### **Consultant Selection:**

Consultant services evaluation will be based on the qualification and approach submitted for the project.

The District will negotiate and finalize the scope and fee proposal for the Project with the selected Consultant if required. If the District is unable to come to an agreement with the Consultant on the terms and conditions or the fee proposal, the District reserves the right to negotiate with the next most qualified Consultant.

Proposals need to be submitted no later than **July 29, 2021 by 4:00 PM** to be considered. One hard copy and one electronic copy are required.

For questions, comments or to request a pre-proposal site visit, please contact Mr. Terry Curson, Project Engineer at (805) 482-8063 or [TerryC@camrosa.com](mailto:TerryC@camrosa.com)

Attachments:

- Exhibit A – General Layout
- Exhibit B – General Pump Report
- Hopkins Groundwater Consulting – Air Entrainment Report
- Entrained Air Analysis
- Camrosa Standard Consultant Agreement & Insurance Requirements





Escolera Ave

Baranca Rd

Palo Verde Cir

Los Cedros Cir

N Redondo Ave

E Las Posas Rd

Redondo Ave

Los Pinos Cir

Horse Trl

Dural Rd

Rosita Rd

Las Posas Cir

Worth Way

Redondo Cir

Hghridge Ct

PENNY WELL

W

Pradera Rd

Breese Dr

Thelma Ln

Glenside Ln

Charisma Ct

Santa Rosa Rd

Rose Ln

Rose

Santa Rosa Rd

Arteta Ln

Red Bam Rd

Applewood Ln

Sumac Ln



EXHIBIT A - SITE LOCATION MAP





934 W. VERDULERA STREET - CAMARILLO, CA 93010  
PHONE: (805) 482-1215 - FAX: (805) 484-2135

**WELL & PUMP SERVICE SINCE 1952**

Lic. #496765

*"Now Serving All Southern California and Central Coast!"*

April 18, 2014

Camrosa Water District  
7385 East Santa Rosa Road  
Camarillo, California 93012-8298

Attn: Robert Barone

**Re: Penny Well – 30 Day Test Summary  
GPC Job No.: 80261**

**General Pump Company (GPC)** is please to provide the following summary of data collected from the Penny Well during the 30 day well test. In addition to providing the data and summary of the data an initial engineer review of a possible pumping solution for this well is provided. The pumping solution is for Camrosa Water District general information to provide a good starting point in the discussions for the final pump design for this well. The data is entered in Table 1 and table 2 below.

#### **Test Data Summary and Notes**

The pump was started July 30 and set initial flow to 300 GPM. The static water level of 59 feet below ground surface was logged and used for calculating specific capacity throughout the 4 week test cycle. Flow was maintained at 280 to 300 GPM and the pump was not turned off during the test period for sufficient time to allow a recheck of the static water level. At the 3 week point the flow was increased to 375 to 380 gpm pumping water level dropped as expected but specific capacity was consistent. Five days later flow was reduced the pumping water level came up with a minor specific capacity change. 24 hours later, flow was reduced again and the pumping water level came up with a minor specific capacity change. See table 1 for tabulated data.

The pump was shut off on August 27 and the static water level monitored. After two minutes the water level had recovered to 157 ft. (from 190 ft.). After ten minutes the water level recovered to 69 ft. This level remained all the way through 30 minutes when monitoring stopped.

#### **Engineering Review and Preliminary Pump Selection**

Using the starting static water level to determine the specific capacity (SC) then a consistent 2.6 gallons per foot of drawdown was observed at all flows tested. The pump was set at 342 ft. below ground level (see drawing 80261 below). This is approximately 40 feet into the perforations. It is not suggested that a submersible pump be placed further into the perforated zone for concerns of proper cooling of the motor. Limitations on capacity exist. The motor is cooled as water flows around it and into the suction of the pump. Restricted flow past the motor or flow coming from above the motor and passing directing into the pump without first passing by the motor are the concerns. A seal could be placed to ensure flow from below the motor but this would limit or completely prevent the upper perforations from contributing water. Without dynamic flow testing in the well to confirm the actual zones the water is entering the well



*"Now Serving All Southern California and Central Coast!"*

while pumping, restricting flow from the upper perforations could lower the specific capacity unexpectedly. Additionally, limits exist on the velocity of water passing the motor. If all water comes from below the pump (not known without dynamic testing spinner logs) flow at 450 gpm would give a velocity of 4.5 ft./sec. approaching the recommended limit of 5 ft./sec. Increasing flow to 500 gpm would give 5 ft./sec. velocity the maximum recommended.

Using 450 gpm as a flow the following criteria was used for a pump selection for the district to use as a tool for future design considerations.

Static water level after 30 min. recovery	69 ft.
Specific Capacity	2.5 gallons per foot of drawdown
Flow Rate	450 gpm
Pumping Water level	249 ft. BGS
Pump Setting	342 ft.
Riser Pipe Size	6"
Internal Pump Losses	10 ft.
System Pressure	134 psi. (310 ft. TDH)
Added Discharge losses	75 ft. (includes elevation change estimated)
Total Dynamic Head	644 ft.
Motor Horse Power	125
Submersible Pump Cable Size	4/0

The pump curve attached represents a selection based on the above data.

### **Conclusion**

The flow of 450 gpm provides a reasonable safety margin on velocity and drawdown. An increase in volume to 500 gpm would eliminate the margin of safety for velocity and drawdown and is not recommended. A sample pump selection is attached that meets these conditions. It is expected that 450 gpm should allow for a good continuous flow of water given the conditions in the well at the time of testing.

This is intended to assist in the district design requirements for the future pump for the penny well. Please review the attached and call with questions if we can assist in the final design development.

Highest Regards,  
**GENERAL PUMP COMPANY, INC.**

*Daniel W. Roth*

Daniel W. Roth  
Project Engineer



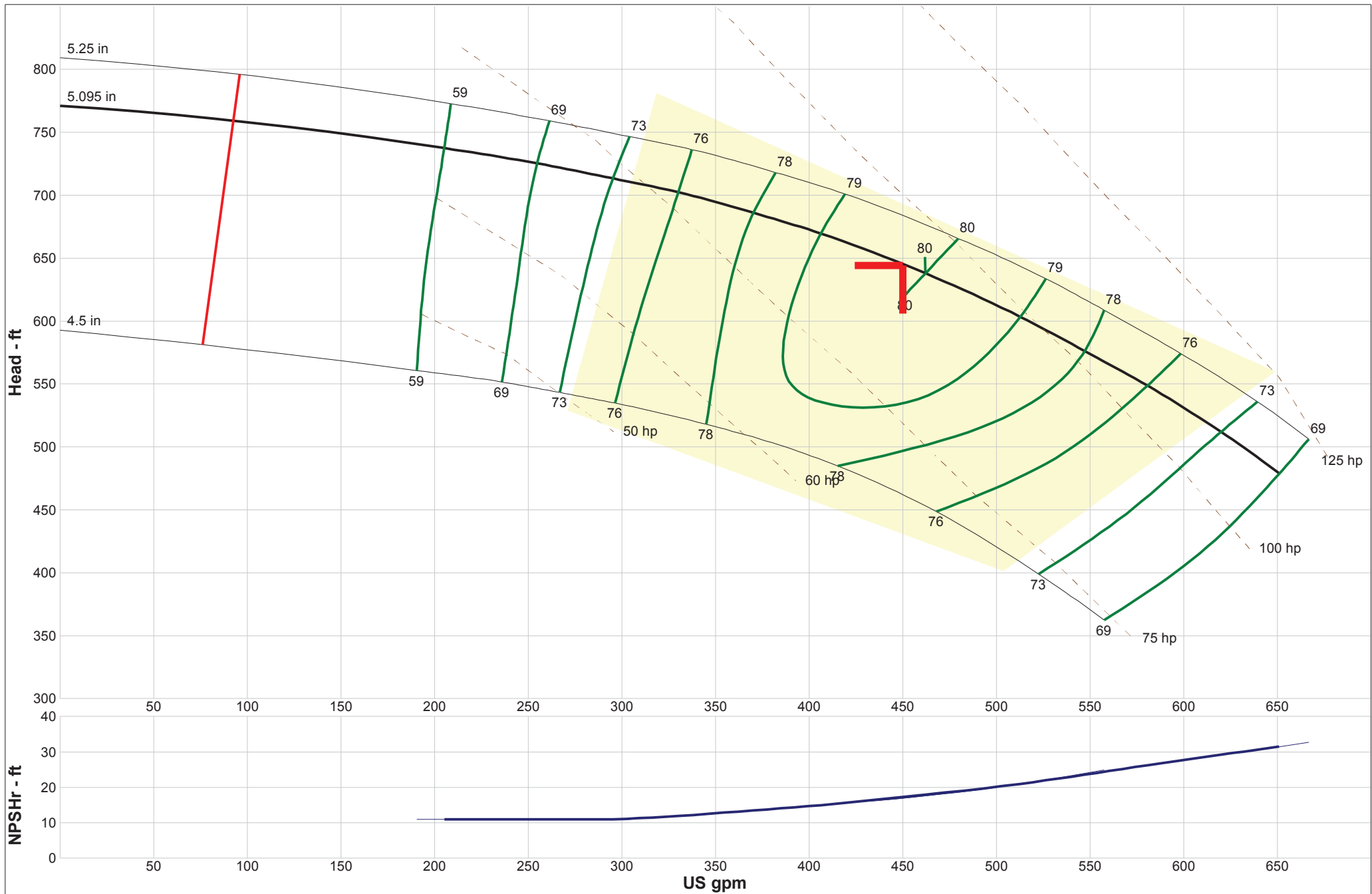
**Table 1**

Date	7/30/13	8/6/13	8/13/13	8/16/13	8/18/13	8/19/13	8/21/13	8/22/13	8/26/13	8/27/13
Discharge Pressure	66	62	58	56	0	0	0	0	24	25
Static Water Level (starting)	59	59	59	59	59	59	59	59	59	59
Pumping Water Level	157	162	162	162	203	206	206	208	192	190
Drawdown	98	103	103	103	144	147	147	149	133	131
Capacity	300	280	280	280	377	375	375	380	340	330
G.P.M. Per Foot Drawdown	3.1	2.7	2.7	2.7	2.6	2.6	2.6	2.6	2.6	2.5

**Table 2**

Time after shut down	2 minutes	10 minutes	30 minutes
Airline Pressure	80 psi.	118 psi	118 psi
Static Water Level	157 ft. BGS	69 ft. BGS	69 ft. BGS

Below Ground Surface (BGS)



Company: GENERAL PUMP COMPANY  
 Name: CAMROSA - PENNY WELL  
 1/10/2014

Hydroflo Pumps USA, Inc.  
 Catalog: Hydroflo VS Pumps.60, Vers 18  
 Submersible - 3600  
 Design Point: 450 US gpm, 644 ft

Size: 7MH 6 stage  
 Speed: 3450 rpm  
 Dia: 5.095 in  
 Curve: 7MH  
 Impeller: 7MH SS ENCL.



# HOPKINS

GROUNDWATER  
CONSULTANTS, INC.  
THE WATER RESOURCE SPECIALISTS



June 11, 2018

Project No. 14-005-04

Camrosa Water District  
7385 Santa Rosa Road  
Camarillo, California 93012

Attention: Mr. Terry Curson  
Project Engineer

Subject: Summary of Well Conditions Review, Camrosa Water District, Penny Well.

Dear Mr. Curson:

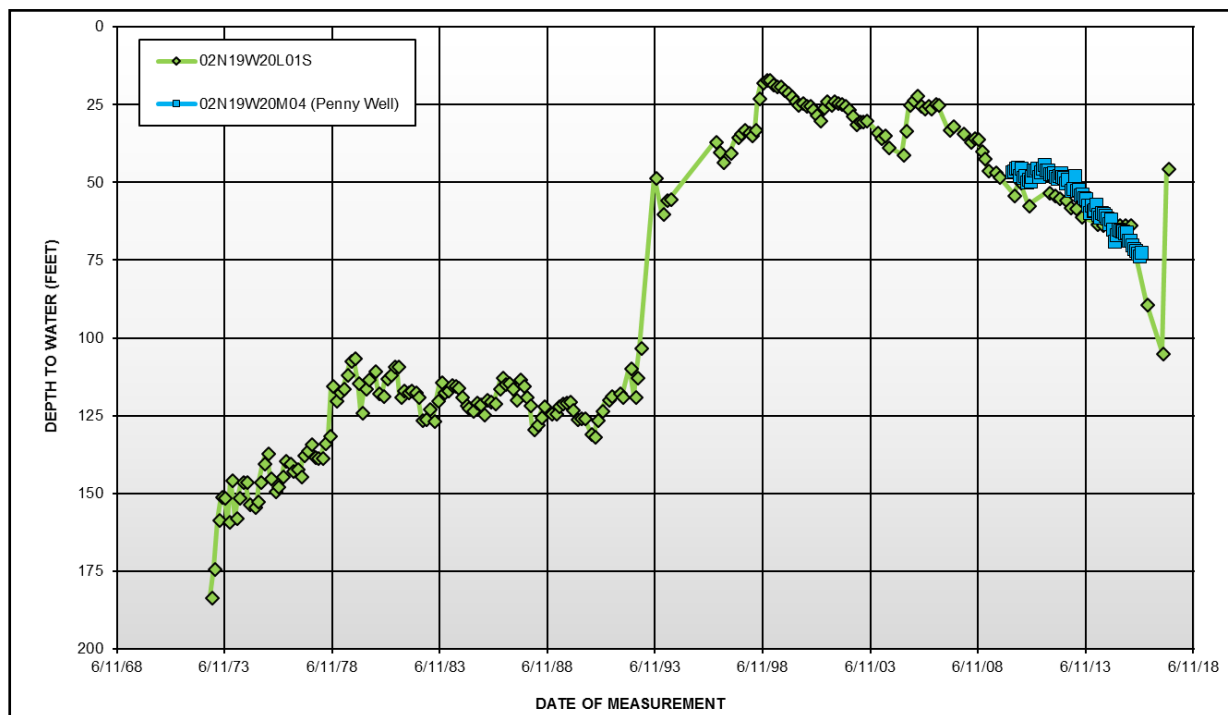
Hopkins Groundwater Consultants, Inc. (Hopkins) is pleased to submit this letter-report summarizing the findings and conclusions of our well conditions review for the existing Camrosa Water District (District) Penny Well. For this well review study, Hopkins obtained historical data and conducted a site visit with District staff to observe well water discharge and site conditions. The well pump equipment is reportedly new and therefore, all pump assembly related issues that could cause gas in the produced well water is believed unlikely.

The groundwater discharged from the well was clear and quickly developed a “white-water” condition where abundant dissolved gas was being released from solution and slowly rising to the top of the sample container. The dissolved gas formed very small bubbles in the water sample and was observed to take approximately 1 ½ minutes to clear. Based on our experience, this type of dissolved gas is natural and could be caused by a number of mechanisms. However, the gas being released did not have a noticeable odor and natural conditions that result in hydrogen sulfide or methane gas formation are not believed present in the volcanic bedrock formation produced by the well. We suspect the formation gas in the groundwater produced by the Penny Well is likely atmospheric and resulted from air being trapped in formation pore spaces during extreme low groundwater level conditions. Subsequent refilling of the aquifer with substantial recharge and reduced use caused the air to be trapped and slowly dissolve into solution at depth.

This inferred scenario is supported by historical groundwater level data available from a proximate well located approximately 2,000 feet east of the Penny Well. Figure 1 – Depth to Groundwater Hydrograph shows the available data from State Well Number 02N/19W-20L01 along with limited data available from the Penny Well. These data indicate that historic water levels have been at least 150 feet lower than basin high conditions in the late 1990’s and 130 feet below the levels in March of 2017. The dissolved gas was likely trapped during one of (or both

of) the recovery periods that occurred in the mid 1970's when levels rose approximately 60 feet and in the early 1990's when groundwater levels rose approximately 100 feet.

**Figure 1 – Depth to Groundwater Hydrograph**



These types of large groundwater level oscillations can be periodic or cyclical and the result is developing slugs of air enriched groundwater that move through the aquifer system at a depth where pressure is sufficient to keep the gas in solution. When the groundwater is pumped to atmospheric conditions and the pressure is relieved the air comes out of solution. While the groundwater containing the dissolved gas may be a relatively small volume and may be purged from the aquifer with continued pumping, the episodic change in groundwater levels in the future could repeat and potentially cause the white-water condition to return. This type of condition could not be predicted prior to pumping and observing the groundwater produced from the Penny Well and future occurrences will be the same.

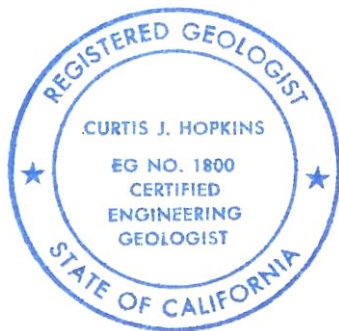
Based on these observations, we conclude that the District may want to consider alternatives to alter its water system at the wellhead in a manner that would allow the gas to escape prior to placing it into the distribution system. We recommend the District sample the gas coming from the well to verify it is non-hazardous and that its removal by simple off-gassing at the wellhead is feasible without further complications.



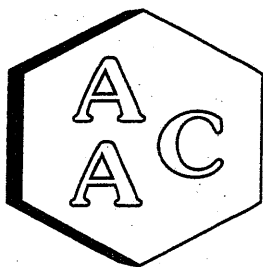
We trust the information contained in this letter-report is sufficient to develop a level of understanding that can guide the District in its decisions on how to proceed with treating the well water and making it acceptable for domestic use. As always, we are pleased to be of service. If you have questions or need any additional information, please give us a call.

Sincerely,

HOPKINS GROUNDWATER CONSULTANTS, INC.



Curtis J. Hopkins  
Principal Hydrogeologist  
Certified Hydrogeologist HG 114  
Certified Engineering Geologist CEG 1800



## Atmospheric Analysis & Consulting, Inc.

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CLIENT : Camrosa Water District  
PROJECT NAME : Penny Well  
AAC PROJECT NO. : 202105  
REPORT DATE : 12/01/2020

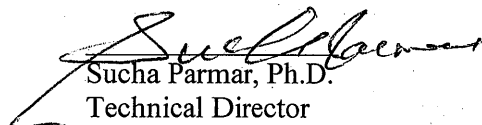
On November 19<sup>th</sup>, 2020, Atmospheric Analysis & Consulting, Inc. received one (1) 3.2-Liter Silonite Canister for Fixed Gases analysis by EPA 3C and Hydrogen Sulfide analysis by ASTM D-5504. Upon receipt, the sample was assigned a unique Laboratory ID number as follows:

Client ID	Lab No.	Return Pressure (mmHg)
Penny Well	202105-14636	626.5

This analysis is performed in accordance with AAC's Quality Manual. For detailed information pertaining to specific EPA, NCASI, ASTM and SCAQMD accreditations (Methods & Analytes), please visit our website at [www.aaclab.com](http://www.aaclab.com).

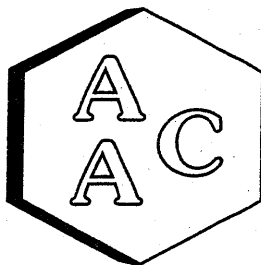
I certify that this data is technically accurate, complete, and in compliance with the terms and conditions of the contract. No problems were encountered during receiving, preparation, and/or analysis of this sample. The Technical Director or his/her designee, as verified by the following signature, has authorized release of the data.

If you have any questions or require further explanation of data results, please contact the undersigned.

  
Sucha Parmar, Ph.D.  
Technical Director

This report consists of 6 pages.





# Atmospheric Analysis & Consulting, Inc.

## Laboratory Analysis Report

CLIENT : Camrosa Water District  
PROJECT NO. : 202105  
MATRIX : AIR

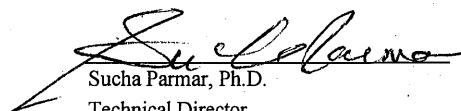
SAMPLING DATE : 11/18/2020  
RECEIVING DATE : 11/19/2020  
ANALYSIS DATE : 11/23/2020  
REPORT DATE : 12/01/2020

### EPA 3C

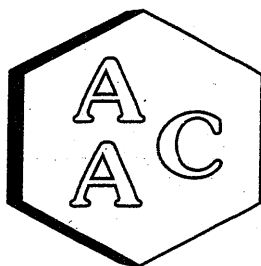
Client ID	Penny Well
AAC ID	202105-14636
Can Dilution Factor	2.43
Analyte	Result
H <sub>2</sub>	< 2.4 %
O <sub>2</sub>	7.8 %
N <sub>2</sub>	91.3 %
CO	< 0.2 %
CO <sub>2</sub>	0.8 %
CH <sub>4</sub>	< 0.2 %

*All fixed gases have been normalized to 100% on a dry basis*

*Sample Reporting Limit (SRL) is equal to Reporting Limit x Analysis Dil. Fac x Canister Dil. Fac*

  
Sucha Parmar, Ph.D.  
Technical Director





# Atmospheric Analysis & Consulting, Inc.

## LABORATORY ANALYSIS REPORT

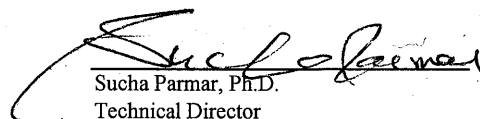
CLIENT : Camrosa Water District  
PROJECT NO. : 202105  
MATRIX : AIR  
UNITS : ppmV

SAMPLING DATE : 11/18/2020  
RECEIVING DATE : 11/19/2020  
ANALYSIS DATE : 11/19/2020  
REPORT DATE : 12/01/2020

### Hydrogen Sulfide Analysis by ASTM D-5504

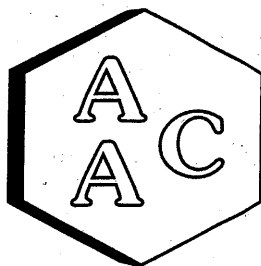
Client ID	Penny Well
AAC ID	202105-14636
Canister Dil. Fac.	2.4
Analyte	Result
Hydrogen Sulfide	0.093

Sample Reporting Limit (SRL) is equal to Reporting Limit x Canister Dil. Fac. x Analysis Dil. Fac.

  
Sucha Parmar, Ph.D.  
Technical Director







# Atmospheric Analysis & Consulting, Inc.

## Quality Control/Quality Assurance Report

Date Analyzed : 11/23/2020

Analyst : CH/DL

Units : %

Instrument ID : TCD #1

Calb Date : 10/05/20

Reporting Limit : 0.1%

### I - Opening Continuing Calibration Verification - EPA 3C

AAC ID	Analyte	H <sub>2</sub>	O <sub>2</sub>	N <sub>2</sub>	CH <sub>4</sub>	CO	CO <sub>2</sub>
CCV	Spike Conc	9.9	10.4	20.2	10.0	10.0	10.0
	Result	9.8	10.3	20.2	10.0	10.0	9.8
	% Rec *	98.6	98.9	100.3	100.1	99.5	98.5

### II - Method Blank - EPA 3C

AAC ID	Analyte	H <sub>2</sub>	O <sub>2</sub>	N <sub>2</sub>	CH <sub>4</sub>	CO	CO <sub>2</sub>
MB	Concentration	ND	ND	ND	ND	ND	ND

### III - Laboratory Control Spike & Duplicate - EPA 3C

AAC ID	Analyte	H <sub>2</sub>	O <sub>2</sub>	N <sub>2</sub>	CH <sub>4</sub>	CO	CO <sub>2</sub>
Lab Control Standards	Sample Conc	0.0	0.0	0.0	0.0	0.0	0.0
	Spike Conc	9.9	10.4	20.2	10.0	10.0	10.0
	LCS Result	9.9	10.3	20.2	10.0	10.0	9.9
	LCSD Result	10.0	10.3	20.2	10.1	10.0	9.8
	LCS % Rec *	100.0	99.2	100.4	100.6	100.2	99.1
	LCSD % Rec *	100.8	98.7	100.1	100.8	100.4	98.7
	% RPD ***	0.8	0.5	0.3	0.2	0.2	0.5

### IV - Sample & Sample Duplicate - EPA 3C

AAC ID	Analyte	H <sub>2</sub>	O <sub>2</sub>	N <sub>2</sub>	CH <sub>4</sub>	CO	CO <sub>2</sub>
202124-14765	Sample	0.0	0.0	0.7	92.5	0.0	0.6
	Sample Dup	0.0	0.0	0.7	92.6	0.0	0.6
	Mean	0.0	0.0	0.7	92.5	0.0	0.6
	% RPD ***	0.0	0.0	1.1	0.1	0.0	0.8

### V - Matrix Spike & Duplicate- EPA 3C

AAC ID	Analyte	H <sub>2</sub>	N <sub>2</sub>	CH <sub>4</sub>	CO	CO <sub>2</sub>
202124-14765	Sample Conc	0.0	0.3	46.3	0.0	0.3
	Spike Conc	9.9	10.1	10.0	10.0	10.0
	MS Result	9.7	10.5	58.3	9.5	9.7
	MSD Result	10.1	10.6	57.0	10.3	10.2
	MS % Rec **	97.6	100.8	120.4	95.2	94.5
	MSD % Rec **	101.4	101.1	107.5	102.6	99.4
	% RPD ***	3.9	0.3	11.3	7.5	5.0

### VI - Closing Continuing Calibration Verification - EPA 3C

AAC ID	Analyte	H <sub>2</sub>	O <sub>2</sub>	N <sub>2</sub>	CH <sub>4</sub>	CO	CO <sub>2</sub>
CCV	Spike Conc	9.9	10.4	20.2	10.0	10.0	10.0
	Result	9.6	10.2	20.3	10.0	10.0	9.8
	% Rec *	97.1	98.0	100.6	99.6	99.6	97.9

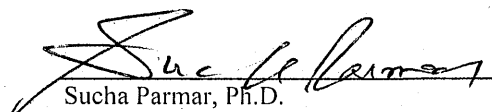
\* Must be 85-115%

\*\* Must be 75-125%

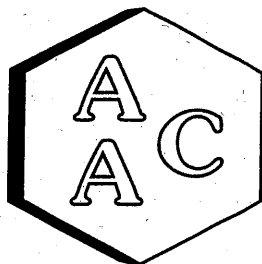
\*\*\* Must be < 25%

ND = Not Detected

<RL = less than Reporting Limit

  
Sucha Parmar, Ph.D.  
Technical Director





# Atmospheric Analysis & Consulting, Inc.

## Quality Control/Quality Assurance Report ASTM D-5504

Date Analyzed: 11/19/2020

Analyst: DL

Units: ppbV

Instrument ID: SCD#10

Calb. Date: 11/16/2020

### Opening Calibration Verification Standard

576.8 ppbV H<sub>2</sub>S (SSI227)

H <sub>2</sub> S	Resp. (area)	Result	% Rec *	% RPD ****
Initial	4680	566	98.2	1.4
Duplicate	4739	573	99.4	0.1
Triplicate	4819	583	101.1	1.5

573.3 ppbV H<sub>2</sub>S (SSI227)

MeSH	Resp. (area)	Result	% Rec *	% RPD ****
Initial	5552	573	100.0	0.1
Duplicate	5654	584	101.8	1.7
Triplicate	5468	565	98.5	1.6

509.8 ppbV H<sub>2</sub>S (SSI227)

DMS	Resp. (area)	Result	% Rec *	% RPD ****
Initial	5892	503	98.7	1.4
Duplicate	6126	523	102.6	2.5
Triplicate	5904	504	98.9	1.2

### Method Blank

Analyte	Result
H <sub>2</sub> S	<PQL
MeSH	<PQL
DMS	<PQL

### Duplicate Analysis

Sample ID 201739-12723

Analyte	Sample Result	Duplicate Result	Mean	% RPD ***
H <sub>2</sub> S	<PQL	<PQL	0.0	0.0
MeSH	<PQL	<PQL	0.0	0.0
DMS	<PQL	<PQL	0.0	0.0

### Matrix Spike & Duplicate

Sample ID 201739-12723 x10

Analyte	Sample Conc.	Spike Added	MS Result	MSD Result	MS % Rec **	MSD % Rec **	% RPD ***
H <sub>2</sub> S	<PQL	288.4	268.9	266.7	93.2	92.5	0.8
MeSH	<PQL	286.6	265.0	271.7	92.4	94.8	2.5
DMS	<PQL	254.9	244.8	245.9	96.0	96.5	0.5

### Closing Calibration Verification Standard

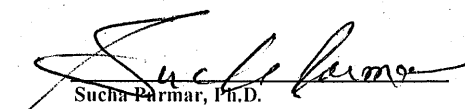
Analyte	Std. Conc.	Result	% Rec **
H <sub>2</sub> S	576.8	580.1	100.6
MeSH	573.3	581.1	101.4
DMS	509.8	517.8	101.6

\* Must be 95-105%, \*\* Must be 90-110%, \*\*\* Must be < 10%, \*\*\*\* Must be < 5% RPD from Mean result.

H<sub>2</sub>S: PQL = 10.0 ppbV, MDL = 1.60 ppbV

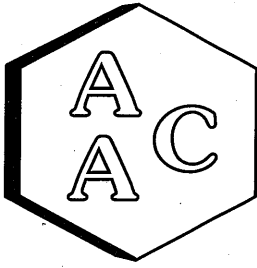
MeSH: PQL = 10.0 ppbV, MDL = 1.60 ppbV

DMS: PQL = 10.0 ppbV, MDL = 1.60 ppbV

  
Sucha Parmar, Ph.D.  
Technical Director







## Atmospheric Analysis & Consulting, Inc.

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CLIENT : Camrosa Water District  
PROJECT NAME : Penny Well Entrained Air  
AAC PROJECT NO. : 180957  
REPORT DATE : 7/9/2018

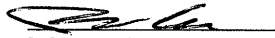
On July 5, 2018, Atmospheric Analysis & Consulting, Inc. received one (1) Tedlar Bag for Fixed Gases analysis by EPA 3C. Upon receipt, the sample was assigned a unique Laboratory ID number as follows:

Client ID	Lab No.
#1	180957-110140

All of the analyses mentioned above were performed in accordance with AAC's ISO/IEC 17025:2005 and NELAP approved Quality Assurance Plan. For detailed information pertaining to specific EPA, NCASI, ASTM and SCAQMD accreditations (Methods & Analytes), please visit our website at [www.aacclab.com](http://www.aacclab.com).

I certify that this data is technically accurate, complete, and in compliance with the terms and conditions of the contract. No problems were encountered during receiving, preparation, and/or analysis of this sample. The Laboratory Director or his/her designee, as verified by the following signature, has authorized release of the data contained in this hardcopy report.

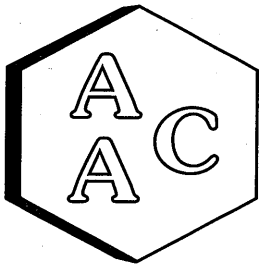
If you have any questions or require further explanation of data results, please contact the undersigned.

  
Marcus Hueppe  
Laboratory Director

This report consists of 4 pages.







# Atmospheric Analysis & Consulting, Inc.

## Laboratory Analysis Report

CLIENT : Camrosa Water District  
PROJECT NO. : 180957  
MATRIX : AIR

SAMPLING DATE : 07/05/2018  
RECEIVING DATE : 07/05/2018  
ANALYSIS DATE : 07/06/2018  
REPORT DATE : 07/09/2018

### EPA 3C

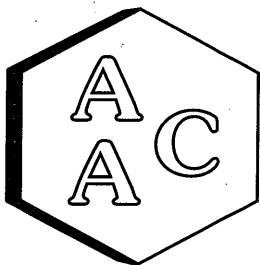
Client ID	#1
AAC ID	180957-110140
Analyte	Result
H <sub>2</sub>	< 1.0 %
O <sub>2</sub>	17.3 %
N <sub>2</sub>	81.9 %
CO	< 0.1 %
CO <sub>2</sub>	0.8 %
CH <sub>4</sub>	< 0.1 %

*All fixed gases have been normalized to 100% on a dry basis*

*Sample Reporting Limit (SRL) is equal to Reporting Limit x Analysis Dil. Fac x Canister Dil. Fac*

Marcus Hueppe  
Laboratory Director





# Atmospheric Analysis & Consulting, Inc.

## Quality Control/Quality Assurance Report

Date Analyzed : 07/06/2018  
Analyst : DL  
Units : %

Instrument ID : TCD #1  
Calb Date : 05/17/18  
Reporting Limit : 0.1%

### I - Opening Continuing Calibration Verification - EPA 3C

AAC ID	Analyte	H <sub>2</sub>	O <sub>2</sub>	N <sub>2</sub>	CH <sub>4</sub>	CO	CO <sub>2</sub>
CCV	Spike Conc	9.5	10.4	19.9	10.3	10.2	10.2
	Result	9.4	10.3	20.3	10.5	10.3	10.1
	% Rec *	98.4	99.4	102.2	102.1	101.5	99.1

### II - Method Blank - EPA 3C

AAC ID	Analyte	H <sub>2</sub>	O <sub>2</sub>	N <sub>2</sub>	CH <sub>4</sub>	CO	CO <sub>2</sub>
MB	Concentration	ND	ND	ND	ND	ND	ND

### III - Laboratory Control Spike & Duplicate - EPA 3C

AAC ID	Analyte	H <sub>2</sub>	O <sub>2</sub>	N <sub>2</sub>	CH <sub>4</sub>	CO	CO <sub>2</sub>
Lab Control Standards	Sample Conc	0.0	0.0	0.0	0.0	0.0	0.0
	Spike Conc	9.5	10.4	19.9	10.3	10.2	10.2
	LCS Result	9.5	10.4	20.4	10.5	10.3	10.1
	LCSD Result	9.5	10.7	20.8	10.8	10.6	10.3
	LCS % Rec *	100.2	100.2	102.5	102.2	101.2	99.1
	LCSD % Rec *	100.2	102.4	104.8	105.0	104.2	100.7
	% RPD ***	0.1	2.1	2.3	2.6	2.9	1.7

### IV - Sample & Sample Duplicate - EPA 3C

AAC ID	Analyte	H <sub>2</sub>	O <sub>2</sub>	N <sub>2</sub>	CH <sub>4</sub>	CO	CO <sub>2</sub>
180957-110140	Sample	0.0	17.1	80.8	0.0	0.0	0.8
	Sample Dup	0.0	16.8	79.3	0.0	0.0	0.8
	Mean	0.0	17.0	80.1	0.0	0.0	0.8
	% RPD ***	0.0	1.7	1.9	0.0	0.0	0.6

### V - Matrix Spike & Duplicate- EPA 3C

AAC ID	Analyte	H <sub>2</sub>	N <sub>2</sub>	CH <sub>4</sub>	CO	CO <sub>2</sub>
180957-110140	Sample Conc	0.0	40.0	0.0	0.0	0.4
	Spike Conc	9.5	9.8	10.3	10.2	10.2
	MS Result	9.7	51.0	11.2	11.1	11.1
	MSD Result	9.6	50.5	11.0	10.8	11.0
	MS % Rec **	102.3	112.2	109.5	109.2	105.4
	MSD % Rec **	100.9	106.6	107.0	106.1	103.9
	% RPD ***	1.4	5.1	2.3	2.9	1.4

### VI - Closing Continuing Calibration Verification - EPA 3C

AAC ID	Analyte	H <sub>2</sub>	O <sub>2</sub>	N <sub>2</sub>	CH <sub>4</sub>	CO	CO <sub>2</sub>
CCV	Spike Conc	9.5	10.4	19.9	10.3	10.2	10.2
	Result	9.3	10.8	20.9	10.9	10.7	10.2
	% Rec *	97.5	103.6	105.2	105.7	104.9	100.3

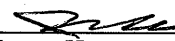
\* Must be 85-115%

\*\* Must be 75-125%

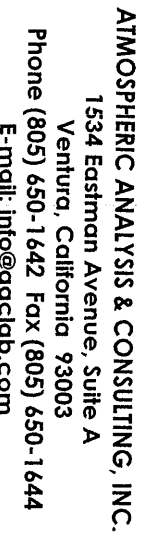
\*\*\* Must be < 25%

ND = Not Detected

<RL = less than Reporting Limit

  
Marcus Hueppe  
Laboratory Director





Page of

Camasse Water District

[illegible]

**Camrosa Water District  
7385 Santa Rosa Rd.  
Camarillo, CA 93012  
Telephone (805) 482-4677 - FAX (805) 987-4797**

**Some of the important terms of this agreement are printed on pages 2 through 3. For your protection, make sure that you read and understand all provisions before signing. The terms on Page 2 through 3 are incorporated in this document and will constitute a part of the agreement between the parties when signed.**

TO:

DATE:

Agreement No.:

The undersigned Consultant offers to furnish the following:

Contract price \$:

Contract Term:

Instructions: Sign and return original. Upon acceptance by Camrosa Water District, a copy will be signed by its authorized representative and promptly returned to you. Insert below the names of your authorized representative(s).

Accepted: Camrosa Water District

Consultant:

By: \_\_\_\_\_  
Tony L. Stafford

By: \_\_\_\_\_

Title: General Manager

Title:

Date: \_\_\_\_\_

Date: \_\_\_\_\_

Other authorized representative(s):

Other authorized representative(s):

\_\_\_\_\_

\_\_\_\_\_

Consultant agrees with Camrosa Water District (District) that:

- a. **Indemnification:** To the extent permitted by law, Consultant shall hold harmless, defend at its own expense, and indemnify the District, its directors, officers, employees, and authorized volunteers, against any and all liability, claims, losses, damages, or expenses, including reasonable attorney's fees and costs, arising from negligent acts, errors or omissions of Consultant or its officers, agents, or employees in rendering services under this contract; excluding, however, such liability, claims, losses, damages or expenses arising from the District's sole negligence or willful acts.
- b. **Minimum Insurance Requirements:** Consultant shall procure and maintain for the duration of the contract insurance against claims for injuries or death to persons or damages to property which may arise from or in connection with the performance of the work hereunder and the results of that work by the Consultant, his agents, representatives, employees or subcontractors.
- c. **Coverage:** Coverage shall be at least as broad as the following:
  1. **Commercial General Liability (CGL) -** Insurance Services Office (ISO) Commercial General Liability Coverage (Occurrence Form CG 00 01) including products and completed operations, property damage, bodily injury, personal and advertising injury with limit of at least two million dollars (\$2,000,000) per occurrence. If a general aggregate limit applies, either the general aggregate limit shall apply separately to this project/location (coverage as broad as the ISO CG 25 03, or ISO CG 25 04 endorsement provided to the District) or the general aggregate limit shall be twice the required occurrence limit.
  2. **Automobile Liability -** (If applicable) Insurance Services Office (ISO) Business Auto Coverage (Form CA 00 01), covering Symbol 1 (any auto) or if Consultant has no owned autos, Symbol 8 (hired) and 9 (non-owned) with limit of one million dollars (\$1,000,000) for bodily injury and property damage each accident.
  3. **Workers' Compensation Insurance -** as required by the State of California, with Statutory Limits, and Employer's Liability Insurance with limit of no less than \$1,000,000 per accident for bodily injury or disease.
  4. **Waiver of Subrogation:** The insurer(s) named above agree to waive all rights of subrogation against the District, its directors, officers, employees, and authorized volunteers for losses paid under the terms of this policy which arise from work performed by the Named Insured for the District; but this provision applies regardless of whether or not the District has received a waiver of subrogation from the insurer.
  5. **Professional Liability -** (also known as Errors & Omission) Insurance appropriate to the Consultant profession, with limits no less than \$1,000,000 per occurrence or claim, and \$2,000,000 policy aggregate.
- d. **If Claims Made Policies:**
  1. The Retroactive Date must be shown and must be before the date of the contract or the beginning of contract work.
  2. Insurance must be maintained and evidence of insurance must be provided **for at least five (5) years after completion of the contract of work.**
  3. If coverage is canceled or non-renewed, and not replaced with another claims-made policy form with a Retroactive Date prior to the contract effective date, the Consultant must purchase "extended reporting" coverage for a minimum of five (5) years after completion of contract work.

If the Consultant maintains broader coverage and/or higher limits than the minimums shown above, the District requires and shall be entitled to the broader coverage and/or higher limits maintained by the Consultant. Any available insurance proceeds in excess of the specified minimum limits of insurance and coverage shall be available to the District.

**Other Required Provisions:** The general liability policy must contain, or be endorsed to contain, the following provisions:

- a. **Additional Insured Status:** District, its directors, officers, employees, and authorized volunteers are to be given insured status (at least as broad as ISO Form CG 20 10 10 01), with respect to liability arising out of work or operations



performed by or on behalf of the Consultant including materials, parts, or equipment furnished in connection with such work or operations.

- b. **Primary Coverage:** For any claims related to this project, the Consultant's insurance coverage shall be primary at least as broad as ISO CG 20 01 04 13 as respects to the District, its directors, officers, employees, and authorized volunteers. Any insurance or self-insurance maintained by the District, its directors, officers, employees, and authorized volunteers shall be excess of the Consultant's insurance and shall not contribute with it.

**Notice of Cancellation:** Each insurance policy required above shall provide that coverage shall not be canceled, except with notice to the District.

**Self-Insured Retentions:** Self-insured retentions must be declared to and approved by the District. The District may require the Consultant to provide proof of ability to pay losses and related investigations, claim administration, and defense expenses within the retention. The policy language shall provide, or be endorsed to provide, that the self-insured retention may be satisfied by either the named insured or the District.

**Acceptability of Insurers:** Insurance is to be placed with insurers having a current A.M. Best rating of no less than A:VII or as otherwise approved by the District.

**Verification of Coverage:** Consultant shall furnish the District with certificates and amendatory endorsements or copies of the applicable policy language effecting coverage required by this clause. All certificates and endorsements are to be received and approved by the District before work commences. However, failure to obtain the required documents prior to the work beginning shall not waive the Consultant's obligation to provide them. The District reserves the right to require complete, certified copies of all required insurance policies, including policy Declaration and Endorsements pages listing all policy endorsements. If any of the required coverages expire during the term of this agreement, the Consultant shall deliver the renewal certificate(s) including the general liability additional insured endorsement to Camrosa Water District at least ten (10) days prior to the expiration date.

**Subcontractors:** Consultant shall require and verify that all subcontractors maintain insurance meeting all the requirements stated herein, and Consultant shall ensure that the District, its directors, officers, employees, and authorized volunteers are an additional insured on Commercial General Liability Coverage.

**Other Requirements:**

- a. Consultant shall not accept direction or orders from any person other than the General Manager or the person(s) whose name(s) is (are) inserted on Page 1 as "other authorized representative(s)."
- b. Payment, unless otherwise specified on Page 1, is to be 30 days after acceptance by the District.
- c. Permits required by governmental authorities will be obtained at Consultant's expense, and Consultant will comply with applicable local, state, and federal regulations and statutes including Cal/OSHA requirements.
- d. Any change in the scope of the professional services to be done, method of performance, nature of materials or price thereof, or to any other matter materially affecting the performance or nature of the professional services will not be paid for or accepted unless such change, addition or deletion is approved in advance, in writing by the District. Consultant's "other authorized representative(s)" has/have the authority to execute such written change for Consultant.

The District may terminate this Agreement at any time, with or without cause, giving written notice to Consultant, specifying the effective date of termination.