



California Department of Public Health
MEMORANDUM

DATE: May 22, 2014

TO: Dave M. Mazzer, Ph.D., Acting Division Chief *for JMW*
Division of Drinking Water and Environmental Management (DDWEM)

VIA: Lance Reese, Chief *LR*
Technical Programs Branch

Dat Tran, P.E., Chief *DT*
Engineering Technical Assistance Section

Bruce Burton, P.E., Chief *See email dated 5/22/14 attached.*
Drinking Water Field Operations Branch

Stefan Cajina, P.E., Chief *SC*
North Coast Regional Engineer

FROM: Michelle F. Frederick, P.E. *MFF*
District Engineer
Mendocino District

SUBJECT: Redwood Valley County Water District (System No.: 2310008) - PUBLIC WATER SYSTEM DROUGHT EMERGENCY (PWSDE) FUNDING REQUEST

This is a report from CDPH Mendocino District Office regarding the findings as they relate to a request for PWSDE funding from the **Redwood Valley County Water District public water system**.

NOTE: This request references the events that occurred in January and February 2014, for which a Prop 84 funding memo was received and processed on February 18, 2014 but never executed by the Department. The intent of this memo is to modify the funding source for the approved drought project from unrestricted Prop 84 funds to drought restricted PWSDE funds. Therefore, unless otherwise specified this funding application is based on the Prop 84 funding project submitted by the system on January 28, 2014 and reflects the events at that time. To date, the water system continues to be drought threatened but is not in the acute nature that it was in January and February 2014.

PWSDE FUNDING REQUEST

1) PWSDE requested contract type:

Oral Written

2) Name of person requesting PWSDE funding:

Bill Koehler

3) Title of person requesting PWSDE funding:

General Manager

4) PWSDE emergency type:

Drought related drinking water emergency (in Jan/Feb 2014)

Threatened emergency drought (at present)

5) Public water system(s) Type:

Community water system:

Public water system owned by a public school district:

6) Provide name(s) of **public water system(s)** involved in this PWSDE funding request, please list the classifications for each public water system included (i.e. community, non-community or public water system owned by a public school district):

Redwood Valley County Water District (District), community

DROUGHT EMERGENCY DESCRIPTION

1) Describe the emergency and explain how this is a **drought related drinking water emergency** or **threatened emergency**. (attach any supporting documentation/calculations)

The current drought has produced extremely low levels in Lake Mendocino, the source of supply for the District.

In mid-February, the Lake Mendocino water level (including the large February 8th, 2014 rain event) was within 9 feet of the District's intake. The lake level was dropping at a rate of approximately 2.5 inches per day. Assuming no rain and the lake elevation decreases at the time, the water system had approximately 40 days of water left before its intake was out of the water.

The District has a 68 acre-foot storage reservoir at its water treatment plant and no groundwater well sources. However, all of the storage pond may not be usable due to sedimentation. Therefore, assuming that $\frac{3}{4}$ of the reservoir is available it is estimated to have approximately another 30-40 days available. Therefore, the system was anticipated to run out of water for its 1,344 water connections as soon as late-April or at best, by June 2014 based on conservation and full usage of the storage reservoir. The District's water production in 2012 was 169.09 million gallons. The average demand and maximum day demand of the water system in 2012 was 463,260 gallons per day and 1,010,000 gallons, respectively.

At present, the water level in Lake Mendocino has risen to approximately 31 feet above the intake. However, this is likely to continue to fall over the summer and it is likely that the water system may return to a critical state if the water level begins to fall near its intake again in late Fall.

During the 2009 drought, the water system was also within 5 feet of having its intake out of the lake. The water system made contingency plans after to provide a barge to double pump into the caisson during the next drought. This was tried during this drought but there were significant environmental concerns that prevented them from putting this into practice although they did rent the equipment to make this happen during February 2014.

Please also see the Proposition 84 Part 2 Emergency Grant Fund Request dated February 18, 2014.

- 2) If the emergency is a **threatened emergency**, in what estimated timeframe is a water outage expected to occur?

On February 19, 2014, it was anticipated that the District would run out of water as soon as late-April 2014 or at best June 2014 if there was not additional rain. Since there was additional rain, the lake level, according to DWR's website, is now at up to 726 feet MSL, approximately 40% of its storage capacity. The elevation of the intake is estimated at 695 feet. If the lake level falls at approximately 2 inches per day, the District's intake will be out of water in 6 months. The District has a 68 acre-foot storage reservoir at its water treatment plant and no groundwater well sources. However, all of the storage pond may not be usable due to sedimentation. Therefore, assuming that $\frac{3}{4}$ of the reservoir is

available it is estimated to have approximately an additional 30-40 days available.

DROUGHT RESPONSE ACTIONS

1) Has the **public water system(s)** instituted water conservation measures?

Yes No

a) If so, what are the conservation measures?

The District has implemented various levels of conservation over the past few months. As of April 21, 2014, the water system cut-off all agricultural usage and residents are limited to 50 gallons per day per person. This is due in part of water rights issues also related to the drought.

b) If so, are the conservation measures mandatory or voluntary?

Mandatory Voluntary

c) If not, are the PWS's service connections metered?

Yes No

i. If so, does the PWS charge a metered rate within their rate structure?

Yes No

2) Has the public water system's Local Health Officer or Local Director of Environmental Health taken any drinking water drought response actions?

On January 7, 2014, Mendocino County Board of Supervisors unanimously declared a drought emergency. On January 17, 2014, Governor Edmond G. Brown Jr, proclaimed a State of Emergency due to the drought in California.

The City contacted Mendocino County Office of Emergency Services for assistance. Mendocino County did not have adequate resources to deal with the emergency. The total cost of the project is beyond the potential resources of the City and the county.

PROJECT DESCRIPTION

- 1) Describe the project proposed to address the **drought related drinking water emergency or threatened emergency?**

The Redwood Valley CWD currently relies solely on surface water from Lake Mendocino, which is highly impacted by the drought. They obtain water via two water rights: one a contact with Russian River Flood Control District and another which is an appropriative winter right. Both of these water rights are limited to usage when there is excess water in Lake Mendocino. Therefore, the System has two issues: (1) water rights limitations and (2) a physical limitation to Lake Mendocino from its intake being out of the water. The water rights limitation has been solved for the year with an allocation of 355 ac/ft of water provided by the Russian River Flood Control and Water Conservation and Improvement District for domestic water supply.

The District has an emergency 4-inch intertie to Calpella County Water District (Calpella). Due to physical pipe limitations, the District can receive up to 100 gpm capacity for a limited time period from Calpella without impacting Calpella's operations. However, this is insufficient to supply Redwood Valley County Water System population of approximately 5,000 people with an adequate supply of water). Additionally, the existing intertie may not be sustainable over a long period of time due to hydraulic demands. Therefore, the immediate solution to the drought is to construct a second 6-inch intertie between the District and Calpella. This would be located in an area that would not have pipe restrictions that would limit flow to the District.

The project will also require upgrades the Millview County Water District's (Millview) intertie. Calpella's primary sources of water are from Millview and their own 25 gpm well. Therefore, Calpella alone does not have sufficient supply to provide water to the District and without causing potential pressure loss in the Calpella distribution system.

The District has a verbal agreement to receive water from Millview. Once the Calpella and Millview interties are fully functional, the District can also potentially receive water from the City of Ukiah through an existing network of interties in the Ukiah Valley. Due to high producing groundwater wells and a surface water treatment plant with pre-1914 water rights, the City of Ukiah is likely to have excess capacity throughout this drought event. If necessary, the intertie can also be temporarily supplied by a variety of other sources through the network of interties that link the Ukiah valley from Redwood Valley County Water District in the north to Willow County Water District in the south. The existing intertie from the City of Ukiah to Millview is only viable when Millview's tanks are down 10 feet. Therefore, the Ukiah utilities are planning to submit an IRWM grant to try to add a

pump station to this intertie as well as upgrading temporary interties to permanent interties along the Ukiah Valley, and add wells to the City of Ukiah, Millview and Redwood Valley. The water systems may or may not get this funding.

On February 10, 2014, the District submitted CDPH plans for the entire intertie project which included addition of the 6-inch intertie to Calpella and upgrade of the Millview/Calpella intertie.

- 2) How will the project achieve the most immediate and reliable supply of domestic water for the duration of the **drought related drinking water emergency or threatened emergency**?

The project will provide the District with at least a minimal supply of disinfected water to maintain emergency water supplies.

- 3) Is the project for an interim or permanent solution, or both? Please explain.

Interim Permanent Both

The emergency intertie would be permanent and long-term since it would add complementary sources with enough capacity for the District to get through future droughts, particularly if the City of Ukiah/Millview intertie is upgraded through an IRWM grant.

- 4) When must project commence (interim and permanent solution)?

The pipeline design is done and permits are received. The construction began on May 8, 2014.

- 5) How long will it take to complete the project? (Days/Months)

Approximately three months

- a) What is the timeframe for the interim solution?(days/months)

Not applicable.

- b) What is the timeframe for completion of the long term solution?(days/months)

The project is anticipated to be completed by mid-August 2014.

- 6) Estimated total project cost (including both interim and permanent solution):

The intertie plans were prepared by Brelje & Race Consulting Civil Engineers

(Brelje & Race). The total cost of the project was estimated to be \$399,000, see attached cost estimate. The project is estimated to take 12 weeks. The project commenced construction on May 8, 2014.

a) What is the project cost of the interim solution?

N/A

b) What is the project cost of the permanent solution?

\$399,000, for the intertie from Redwood Valley to Millview

Note: The system is also planning/seeking funds for a well development project. The system has drilled one well in the past and it only produced approximately 5 gallons per minute due to very mixed geology in the region. Therefore, the CDPH district staff has proposed to focus on the intertie project instead of well development as it is more likely to result in a completed project.

7) Estimated total eligible project cost:

\$399,000

8) PWSDE funding amount requested:

\$399,000

9) Is the project cost effective? (explain other alternatives evaluated, if applicable)

Yes. Hauling water to a community of this size is not a viable option as it would take approximately 72 3,500-gallon tankers per day to maintain only 50 gallons per person. It is also unknown where this water would come from as water is scarce in the region. The only other option is to drill wells, but the water system has attempted to drill wells in the past. Well 01 which was drilled several years ago in an attempt to obtain another water supply only produced 5 gallons per minute.

OTHER FUNDING SOURCES

1) Have you informed the **public water system(s)** representative that in order to receive PWSDE funding, they will have to self-certify as a condition of the funding agreement that the **public water system(s)** is applying any and all available

emergency reserves and/or other unrestricted reserves to fund in part or whole the project prior to submitting claims for reimbursement to CDPH?

Yes No

- 2) Does the **public water system(s)** have any available emergency reserves and/or other unrestricted reserves to fund the project in part or in whole?

Yes No

- a) If so, what is the source?

- b) If so, how much is available for the project?

- c) If not, why?

The system is simultaneously trying to do a well development project and putting funds toward this project as part of a community match necessary to obtain IRWM funds. If successful, this project would be able to deal with the water rights issues that the system currently has. However, as previously noted District staff supports the intertie project as the geology of the area may have limited production capacity.

- 3) Has the **public water system(s)** submitted a Safe Drinking Water State Revolving Fund ("SDWSRF") pre-application, or is a related project established on the PPL?

(Pre-app) Yes No (PPL listing) Yes No

- a) If a SDWSRF pre-application has not been submitted, when is the public water system(s) expected to submit a SDWSRF pre-application?

The District has never submitted a SDWSRF project, despite its connection moratorium since April 1989. This is because the water system defaulted on a federal loan and is therefore not eligible for SRF funding.

- b) If listed on the PPL, what is the SDWSRF project number?

c) In what PPL category is the project listed?

d) If the project is not ranked in a fundable range is the District requesting the project be re-ranked?

Yes No

Category recommended:

e) Based upon coordination with the CDPH Technical Programs Branch, is SDWSRF funding readily available, at this time, to achieve a permanent solution meeting the time constraints of the emergency?

Yes No (explain)

f) If the SDWSRF pre-application/project is within or proposed to be within the SDWSRF fundable range, has the public water system submitted the following to the SDWSRF Fiscal Services Unit? (Please check the documents that have been submitted)

- Audited or unaudited financial statements and/or tax returns
- Average residential water rate
- Service area map
- Public water system ownership and formation documentation
- Water rights
- IRS 501(c) tax exemption determination, if a mutual water company
If not, explain

4) Has the **public water system(s)** taken any actions to obtain funds from other sources?

Yes No (explain)

a) If so, what is the source and type of action taken?

The System has very limited access to funding sources, due to their loan default. During the January and February 2014, they contact Mendocino County to try to obtain funding for the intertie. The County did not have adequate funds for the project.

Six community public water systems in the Ukiah Valley will be applying for the IRWM grant to create a stronger network of permanent interties and the addition of three wells to connect the Valley's water providers to facilitate water delivery in case of drought or other future emergencies. If no PWSDE funds are provided through this application process, the System will attempt to utilize the IRWM funding however those funding sources are much more competitive because they are not limited to public water system drought impacts. In the IRWM funding application, the System has stated that they are actively seeking funding through our programs as well.

b) If so, what is the availability and timeline of award for such other funds?

If an IRWM grant is submitted, the application must be submitted by July 2014 and selection will occur in the late Fall of 2014.

c) If not, why?

Not applicable.

5) District recommended PWSDE Funding Amount:

\$399,000

DISTRICT OFFICE RECOMMENDED SPECIAL CONDITIONS

The District has obtained water rights in the amount of 355 ac/ft from the Russian River Flood Control and Water Conservation and Improvement District for domestic water supply. As a condition of the funding, it should be stated that the 355 ac/ft be only used for domestic supply as this is currently their sole source of water rights for 2014. As a condition of the funding reimbursement, the District also recommends that written contracts be in place to allow permission from Calpella to wheel water across the intertie and a contract with Millview MWC to provide emergency water to the District. The 355 ac/ft of allotted water could theoretically be supplied from Millview or the City of Ukiah if it is unavailable from the lake intake for the District. The District also recommends that if the project is approved, that steps be required to ensure that IRWM funds are decreased for the costs related to this intertie.

PUBLIC WATER SYSTEM INFORMATION

1) Public Water System Primary Contact Information:

Name/Title:

Bill Koehler, General Manager

Physical Address:

2370 Webb Ranch Road

P.O. Box:

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City:

Redwood Valley

California, Zip code:

95470

E-mail:

gmrvcwd@pacific.net

Phone no.:

(707) 485-0679

2) Population served:

5,000 (Note: historical documents have shown a population of 3,969. However, according to the water system and as a result of the 50 gallons per person per day limit, they have received many population changes and believe that the actual population is approximately 5,000.)

3) Number of service connections:

1,339

4) County:

Mendocino

cc: Brian Kinney, P.E., ETAS
James Garrett, ETAS
Anne Novak, Chief, Project Support Unit
Joshua Ziese, Chief, Infrastructure Funding Administration Section
Thera Hearne, Chief, Disbursement Unit
Sylvester Okeke, PSU Pipeline Coordinator
Seresia Hartwell, PSU Analyst
Regional Funding Coordinator
DWPFUNDS@cdph.ca.gov



Redwood Valley County Water District

Post Office Box 399 • Redwood Valley, CA 95470 • (707) 485-0679

February 10, 2014

Ms. Michelle Frederlck
State of California Department of Public Health
50 D Street, Suite 200
Santa Rosa, CA 95404

Dear Ms. Frederlck,

As you know Redwood Valley County Water District (Redwood) receives its supply of water from Lake Mendocino. That supply is in grave danger of running out unless we receive an unprecedented volume of spring rains. The Sonoma County Water District (SCWA) has done modeling and predicts that unless we receive at least ten more inches of rain the lake will be completely dry by September. Even ten inches of additional rain will only result in lake levels similar to the drought year of 1977. This year is the driest year on record for the entire 140 year history of rainfall records. Tree ring analysis indicates that this is the driest year in 400 years.

Redwood is taking several approaches to continuing to provide safe drinking water to its population of 4,000 residents. One is a permanent intertie between Redwood and Calpella CWD on Central Avenue/Uva Drive. This intertie will be served by water supplied by the Millview CWD, wheeled through Calpella CWD. This portion of the intertie will also require an upgrade to the Calpella/Millview intertie to increase capacity from 100 gpm to 400 gpm. In addition to adding approximately 200 gpm into Redwood from Central/Uva, Redwood will also transfer 100 gpm from the existing intertie between Redwood and Calpella on East Road. A second approach that will allow the time to construct the Central/Uva intertie is to pump from the remainder of Lake Mendocino that is underneath the existing diversion. This method would require plugging the existing intake from the inside with a pneumatic plug, then pumping into the caisson, effectively using it as a wet well. Redwood proposes to rent a submersible electric pump to be suspended from a barge that will be supplied by the US Army Corps of Engineers. This approach must be considered as merely a stopgap since the supply of water is limited and is shared with all other surface water districts as far south as Healdsburg.

BOARD OF DIRECTORS

Granville Pool
Jeanette Hallman
Pamela Ricetti
Ken Todd

Redwood's Board of Directors next meets on February 20, 2014. It is likely that Redwood will issue mandatory water rationing for domestic customers and completely curtail agricultural water deliveries. Agricultural customers have already been informed of a 50% reduction with possible complete curtailment. Clearly this will result in huge financial loss to a community almost entirely dependent on the wine grape industry.

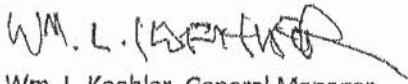
Redwood is requesting financial assistance in the form of grants to complete these projects. The proposed Central/Uva Intertie would be a permanent asset to the area. It would be capable of not only receiving water by pumping from Calpella, and therefore Millview, but also capable of delivering water by gravity to those two systems.

Although the initial design for the booster pump at Lake Mendocino utilizes a rented pump, a purchased pump would also be an asset to the entire community. In the event of a similar drought year it could be used to assist other systems. I expect to have pricing as early as tomorrow for both rental and purchase.

We have attached a detailed analysis of the Calpella / Redwood Intertie on Central / Uva prepared by Breije & Race Engineers that outlines the transfer design details and cost.

We are very interested in moving these projects rapidly ahead. Your assistance is most appreciated.

Regards,



Wm. L. Koehler, General Manager

CC: Dave Redding, Willow County Water District

CC: Richard Ingram, Breije & Race

Brelje & Race

CONSULTING CIVIL ENGINEERS

February 10, 2014

Ms. Michelle Floyd Frederick
State of California Department of Public Health
50 D Street, Suite 200
Santa Rosa, CA 95404

**Subject: Redwood Valley Water District
Emergency Connection to Calpella Water System
B&R File No. 983.09**

Dear Ms. Frederick:

On behalf of the Redwood Valley County Water District, Brelje & Race has prepared the following information associated with a proposed emergency connection between the Redwood Valley and Calpella water systems:

- Project Description and Purpose
- Review of the Calpella Water System Capability
- Preliminary Design
- Project Implementation / Construction Sequence/ Schedule
- Engineering Cost Estimate
- Permitting / Application for Power Supply / Environmental Review
- Supplemental Information

Project Description and Purpose

The current drought has produced extremely low levels in Lake Mendocino, the source of supply for the Redwood Valley Water system. As of last week the lake level was within 9 feet of the District's intakes and the level was falling at a rate of approximately 2 1/4 inches per day. Redwood Valley is seeking an improved emergency connection between its system and the adjacent Calpella water system to meet its domestic water needs through this critical period and others that may arise in the future.

The project will be designed to allow continuous emergency transfer of up to 300 gallons per minute (gpm) of water from the Millview water system through the Calpella water system to the Redwood Valley water system. The proposed schedule for the project reflects an implementation strategy that rapidly delivers the capability to supply emergency water to the Redwood Valley Water

District by initially employing the use of temporary facilities while permanent intertie facilities are under construction. The existing booster pump station that now connects the Calpella and Redwood Valley water systems on East Road has a limited capacity and will be used to accomplish approximately one third of the transfer. The remaining two thirds of the transfer will be accomplished by a new booster pump station located near the north end of the Calpella water system on Central Avenue.

The Calpella and Redwood Valley water systems will be bridged by a new 6-inch water main. The alignment of the new main will follow Central Avenue north for approximately 1450 feet until it meets the Redwood Valley distribution system. Figure 1 shows the proposed general alignment of the new water main and the location of the proposed booster pump station. All infrastructure is proposed to be constructed within the Mendocino County road right-of-way under an encroachment permit from the County. The pump station will be constructed in a remnant right-of-way that is on the western side of the road that formed one side of a dead end of Central Avenue before the frontage roads for the freeway were completed in the early 1990s.

The project will also require the upgrade of the Millview / Calpella booster pump station that is part of the Calpella water system. The pump station typically transfers 100 gpm from Millview to Calpella. After upgrades, the pump station will need to be capable of transferring 400 gpm.

Review of Calpella System Capability

The Calpella water system serves the area that encompasses the small community of Calpella and is sandwiched between the Redwood Valley and Millview water systems to the north and south respectively. The planned project would require Calpella to transfer 300 gallons per minute through the existing piping infrastructure. Figure 2 shows the Calpella water system, the planned improvements and pipe flow rates during the planned transfer. The manager of the Calpella water system has provided his full cooperation regarding the development of the project. Critical to the project's design development was a review of the projected impact to the Calpella water system and a determination if a reduced level of service within the Calpella would be evident. A water system hydraulic model was developed and field testing was conducted to determine the project's level of potential service impacts.

The model was utilized to determine pressure effects on the system when Calpella experiences peak hour demand (PHD) flows coupled with the planned 300 gpm transfer flow. The model assumptions are included in the supplemental information appended to this letter.

Various model cases were attempted and results derived. Cases involving moving 200 gallons per minute or 300 gallons per minute from Millview to Redwood Valley were reviewed. Model simulations were performed varying the flow at the existing pump station on East Road from zero to 125 gpm. Transfer flows above 100 gpm appear to have significant headloss development in the 4-inch main in East Road. System parameters within the Calpella water system that required close examination were supply pressures at the north end of Central Avenue and the north end of State Street as well as suction side pressures at the existing Marina booster pump station.

Pertinent model results for the recommended transfer scenario were as follows:

Recommended Transfer Scenario

- 300 gpm - Transfer Flows to Redwood Valley -- Total
- 200 gpm -- Design flow of new Central Ave. booster pump station
- 100 gpm -- Transfer flow of existing East Road booster pump station
- 400 gpm -- Transfer flow of existing Millview / Calpella booster pump station

Model Results

- 33 psi -- approximate pressure at north end of Central Avenue during transfer
- 39 psi - approximate pressure at north end of N. State street during transfer
- 27 psi -- approximate pressure at suction side of Marina booster pump station

Model results appear to predict adequate residual pressures to maintain satisfactory water service to the Calpella customers.

Verification testing was undertaken by Calpella and Redwood Valley staff on February 6, 2014. The purpose of the testing was to determine the function and capability of the existing booster pump station on East Road between the Calpella and Redwood Valley water systems. The pump station was tested at variable flow rates and pressures were recorded throughout the Calpella water system. The results are included in the appendix of this report. The booster pump was tested with the Capella's well in production. The well is located adjacent to the booster pump station. During the test the well produced 23 gallons per minute of flow. Conclusions drawn from the booster pump station testing support a continuous transfer of flow from Calpella to Redwood Valley of up to 100 gallons per minute from the existing booster pump station.

Preliminary Design

The project will be designed to allow continuous emergency transfer of up to 300 gpm of water from Millview water system through the Calpella water system to Redwood Valley. The existing booster pump station on East Road would be used to accomplish approximately 33% of the transfer. The remaining 67% of the transfer will be accomplished by a new booster pump station located near the north end of the Calpella water system on Central Avenue. The project will also require the upgrade of the Millview / Calpella booster pump station that is part of the Calpella water system. The pump station typically transfers 100 gpm from Millview to Calpella. After upgrades, the pump station will have the capability of transferring 400 gpm.

Preliminary Design Criteria

Central Avenue Booster Pump Station

1. Suction Pressure -- approximately 30 psi
2. Pump Station Elevation -- 800 feet
3. Static tank elevations for the 400,000 gallon South West Redwood Valley Tank -- 975 feet base elevation, 1000 feet max operating level. Design point at 2/3 full -- 992 feet
4. Headlosses: Transmission main (6-inch) plus minor losses -- approximately 30 feet
5. Design Total Dynamic Head -- approximately 150 feet
6. Flow -- 200 gpm
7. Number of pumps -- 2. Each pump to provide one half of the flow to maintain motor sizes small since only single phase power is available. Pump - 2 inch suction, 1.5 inch discharge, close couple centrifugal, horizontal mount, approximate size 26 inches long by 10 -- 12 inches diameter
8. Pump Motor Horsepower -- 7.5 hp each, 3450 RPM, TEFC Motors, 1PH, 208/230 Volt, Baldor or equivalent
9. Tentative Power Requirements -- 200 amp 240 volt service panel with meter, 2 -- 80 amp breakers, one for each pump
10. Controls -- Time delay for pump starts so that both pumps do not start at once, pressure switch for low inlet pressure shut down with manual restart only, high pressure switch on discharge shuts down pump if valve is closed. Pump station is manual on/off operation.
11. Flow meter -- Calpella to Redwood Valley -- range of flow with highest accuracy -- 50 to 250 gpm
12. Flow meter -- Redwood Valley to Calpella -- range of flow with highest accuracy - 50 to 500 gpm
13. Pressure Reducing Valves -- the pump station will be equipped with pressure reducing valves that will allow flows to be transferred from the higher pressure Redwood Valley system to the lower pressure Calpella system in the event that pressures occur in the Calpella system that are abnormally low. Abnormal low pressures may occur in a fire flow circumstance.

Transmission Main

1. Pipe Diameter -- 6-inch
2. Flow rate -- 200 gallon per minute
3. Flow velocity -- 2.3 feet per second
4. Pipe type -- C 900 PVC
5. Average operating pressure - approximately 95 psi

Modifications to Millview / Calpella Booster Pump Station

The current configuration of the pump station at Millview / Calpella has 2 pumps, each having the capability to transfer 100 to 150 gpm from Millview to Calpella. The pump station piping configuration now controls transfers through the use of an orifice plate and flow control valve to a constant rate of 100 gpm. The pump station has a meter to measure transferred flows and through manipulation of several valves can move water from Calpella back to Millview. Design criteria for the modifications to the Millview / Calpella booster pump station include:

1. Suction Pressure – approximately 60 psi (estimated)
2. Pump Station Elevation – 820 feet
3. Static tank elevations for the 250,000 gallon West Calpella Tank – 874 feet base elevation, 896 feet max operating level. Design point at 18 feet full, elevation 892 feet
4. Design Total Dynamic Head – approximately 60 feet (estimated)
5. Flow – 400 gpm
6. Number of pumps – 2 - Each pump to provide one half of the flow. Pump - 4 inch suction, 3 inch discharge, close couple centrifugal, horizontal mount. Pump Motor Horsepower – 5.0 hp each, 1800 RPM, TEFC Motors, 3PH, 480 Volt, Baldor or equivalent

The existing electrical and controls system will require further assessment to determine specific required changes.

Project Implementation / Construction Sequence / Schedule

A preliminary schedule has been developed for the project (Figure 3). The schedule reflects an implementation strategy that rapidly delivers the capability of emergency water supply to the Redwood Valley Water District. Since there will be a need to obtain a building permit and permanent power, and the lead time for the pumps and other mechanical equipment will take a much longer time than the actual construction of the physical pipeline connection, the project has been divided into two phases.

Phase 1 - Pipeline, temporary pumping and temporary power

The increased capability to transfer 300 gpm from Calpella to Redwood valley will require, at a minimum:

1. Upgrades to the Millview / Calpella pump station
2. Installation of a pipeline from Calpella to Redwood Valley
3. Rental of temporary power and pumping facilities

Note that the schedule shows the need for early application for encroachment permits, building permits and request for power supply from PG&E. The District also plans to move rapidly regarding contractor selection and will form an agreement with a contractor with a proven track record for the District. The District, on advisement of their attorney, is not required to conduct the public bidding process. The District does intend to adhere to all State mandated prevailing wage requirements.

Phase 2 - Pump station building, interior mechanical and electrical and permanent power

The second phase of work will begin during Phase 1 construction and include the construction of permanent pumping and power supply, but not be completed until approximately 5 weeks after the Redwood Valley District has established the capability to transfer water from Calpella.

Engineer's Project Budget Estimate

A project budget has been prepared that includes costs for construction, temporary rental and operation of pumping and power supply equipment, engineering and planning, construction management and District costs for administration. The attached full budget estimate for the completed project is \$399,000.

Permitting, Application for Power Supply, Environmental Review

Building and encroachments permits will be required from the County of Mendocino. The District is hopeful that the County will provide priority importance to processing the permits as the State has placed a very strong emphasis on expediting drought related projects. An application for a new power service will be submitted to Pacific Gas and Electric as soon possible in the project development process. A third party electrical contractor will install all of the service's drop components that are allowed. Modifications to the primary power and the final connection will need to be completed by PG&E. The coordination, payment of fees and signing of a service agreement are tasks that will require execution early in the project to assure that the required PG&E work will be completed on schedule (approximately 12 weeks into the schedule).

It is assumed that due to the emergency nature of the project and that the construction will occur entirely within the County Road right-of-way that the project will be eligible for a categorical exemption under the California Environmental Quality Act (CEQA). The project elements will be reviewed and, if appropriate, a Notice of Exemption (NOE) will be filed with the Mendocino County Clerk and the State Clearinghouse.

Ms. Michelle Frederick
February 10, 2014
Page.7 of 7

The following information is appended to this correspondence as supplemental information:

Supplemental Information

- Hydraulic Model Assumptions
- Hydraulic Testing Results -- Field Measurements
- Hydraulic Model Results

We are available for any questions that may arise. If you require additional information please call.

Very truly yours,

BRELJE & RACE



Richard Ingram, P.E.

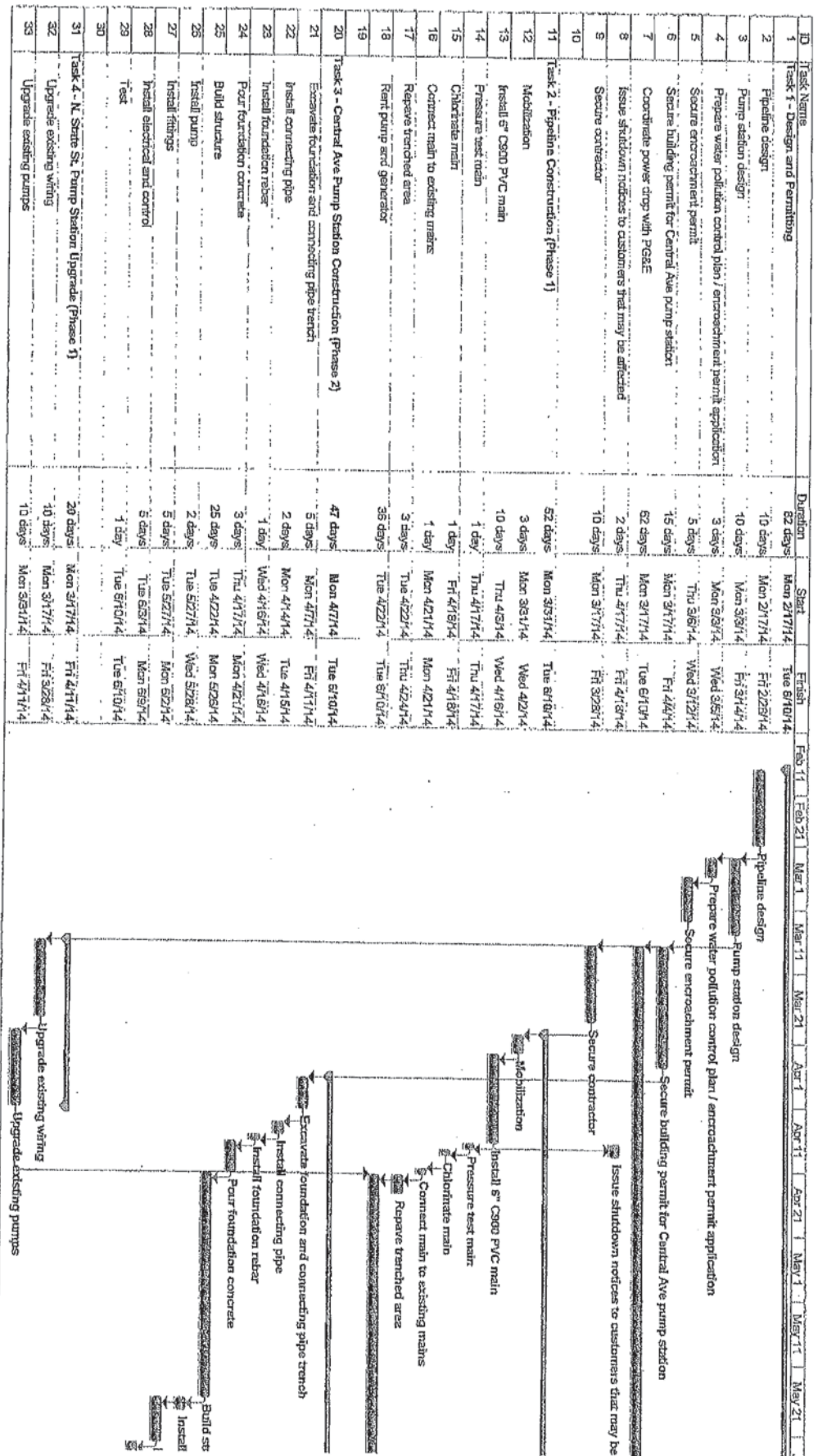
Vice President

cc: Bill Koehler -- Redwood Valley Water District
David Redding -- Calpella Water District

Map Redacted

Map Redacted

Figure 3 - Redwood Valley Emergency Interconnection Preliminary Schedule



REDWOOD VALLEY COUNTY WATER DISTRICT
Connection to Calpella Water System
Preliminary Estimate of Probable Costs
Prepared by Brelje & Race Consulting Engineers
February 2014

Item	Unit	Unit Cost	Quantities	Total Cost
1. Mobilization	LS	\$ 2,100	1	\$ 2,000
2. 6-Inch HDPE water main	FT	\$ 85	1,450	\$ 123,000
3. Tie-in to Redwood Valley water system	LS	\$ 5,000	1	\$ 5,000
4. Tie-in to Calpella water system	LS	\$ 4,000	1	\$ 4,000
5. Tie-in to pump station	LS	\$ 6,000	1	\$ 6,000
6. Pump station site piping	LS	\$ 9,000	1	\$ 9,000
7. Pump station building	SF	\$ 200	140	\$ 28,000
8. Pump station mechanical	LS	\$ 27,000	1	\$ 27,000
9. Pump station electrical	LS	\$ 20,000	1	\$ 20,000
10. Temporary pump and power	LS	\$ 18,000	1	\$ 18,000
11. Permanent power supply	LS	\$ 8,000	1	\$ 8,000
12. Modifications to Millview-Calpella PS	LS	\$ 20,000	1	\$ 20,000
13. Demobilization	LS	\$ 3,000	1	\$ 3,000
Subtotal Construction Cost				\$ 273,000
10% Contingency				\$ 27,000
Engineer's Estimate of Total Construction Cost				\$ 300,000

Encroachment Permit Fee	\$ 1,900
Engineering Planning and Analysis, Assistance with CDPH Processing	\$ 10,000
Engineering Design (12% of construction)	\$ 36,000
Stormwater & Encroachment Permit Applications	\$ 5,000
Construction Management/Inspection (12% of construction)	\$ 36,000
District Administration and Legal	\$ 10,000

Engineer's Estimate of Probable Project Costs	\$ 399,000
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Preliminary Assumptions for modeling of the Calpella Water System:

1. Maximum Day Demand (MDD) for Calpella Water System (CWS) is 100 gpm. Source -- recorded value per Dave Redding of 141,500 gallons max. day (98.3 gpm)
2. Modeled demand for CWS is a peak hourly demand (PHD) of 150 gpm. This is based on the 1.5 multiplier put forth by California Code of Regulations (CCR) 64554 as a method to calculate PHD from MDD.
3. Redwood Valley Water System (RVWS) pass through demand of 300 gpm.
4. Water level in the 250,000 gallon storage tank in the CWS west of Central was set at approximately 2/3 full with a free surface elevation of 892 ft.
5. Junctions (9 in all) around the perimeter of the water system were assigned a base demand of 7.5 gpm.
6. Two junctions in center of CWS along N. State Street were assigned a base demand of 30 gpm.
7. The junction at N. State St. and Durable Mill Rd. was as assigned a base demand of 22.5 gpm.
8. Water enters CWS at pump station on 5200 block of N. State St. at the Millview/Calpella pump station at a flow rate of approximately 400 gpm.
9. Additional CWS flow demands (approximately 50 gpm) are satisfied by 250,000 gallon storage tank.
10. Water exits CWS and enters RVWS at existing pump station on 7000 block of East Rd. north of Hwy 20 and at the planned pumping station at 6700 block of Central Avenue.
11. Water system information derived from CWS provided 2011 GIS map of system.
12. Hazen-Williams coefficients of 130 for plastic pipe and 100 for steel pipe were used.
13. Junction elevations derived from Google Earth (accuracy +/- 10 feet??)

Calpella Water System 400 in/150 demand/200 central 100 RVPS

Network Table - Nodes

Node ID	Elevation ft	Base Demand GPM	Demand GPM	Head ft	Pressure psi
Junc 6"X.MOORE@STATE	675	30	30.00	872.97	85.78
Junc 4"x6"x4"TEE-1	676	30	30.00	873.44	85.55
Junc 4"X.MOORE@STATE	676	0	0.00	873.12	85.41
Junc 6"TEE@NSTATEBYMILL	679	22.5	22.50	872.85	84.00
Junc 6"X4"REDUCER-2	680	0	0.00	872.85	83.56
Junc MILL TERMINUS	684	7.5	7.50	872.85	81.83
Junc 8"x4"COUPLER	686	0	0.00	897.62	91.70
Junc 8"TEECENTRAL@NSTATE	688	7.5	7.50	897.74	90.88
Junc 6"X4"REDUCER-3	691	0	0.00	872.81	78.78
Junc 6"X6"X4"T.TO.BOOSTER	692	0	0.00	871.58	77.81
Junc Millcreek	703	0	0.00	914.44	91.62
Junc 8"TEE-1	703	0	0.00	906.75	88.28
Junc 4"X6"ACTORTPREDUCER	705	0	0.00	871.58	72.18
Junc 4"X4"X6"TEECORTINAPL	709	0	0.00	857.53	64.36
Junc 4"X6"X4"T@E.CAP.RD	711	0	0.00	871.61	69.59
Junc RV.PUMP.STATION	712	107.5	107.50	796.69	36.70
Junc 6"X4"RED.MOORE@SCHOOL	733	0	0.00	887.20	66.81
Junc CORTINAPLHYDRANT	763	7.5	7.50	857.53	40.96
Junc 8"X@MOORE&CENTRAL	774	7.5	7.50	887.60	49.22
Junc N.STATE.TERM	783	7.5	7.50	872.78	38.90
Junc 8"JUNCTOSOUTH TANK	784	7.5	7.50	891.90	46.75
Junc CENTR.AVE.TERM	801	207.5	207.50	877.00	32.93
Junc MARINA.BOOS.STA	809	7.5	7.50	871.57	27.11
Resvr Millview Tie-In	821	#N/A	-400.07	821.00	0.00
Tank CALPELLA250KTANK	874	#N/A	-49.93	892.00	7.80

Calpella / RVWD Intertie

Pumping from Calpella to RVWD on February 6, 2014					
Sites	Static	50 GPM	75 GPM	100 GPM	128 GPM (MAX)
Suction (In Well house)	85 psi	82 psi	80 psi	75 psi	64 psi
Discharge (In Vault after pump)	120 psi	-	-	-	-
North Central	40 psi	40 psi	40 psi	40 psi	40 psi
North State	50 psi	50 psi	50 psi	50 psi	49 psi
Marnia Booster	35 psi	35 psi	34 psi	34 psi	31 psi
Tank Level	18 FT	18 FT	18 FT	18 FT	18 FT

RVWD to Calpella = 80 GPM (MAX)

Novak, Anne (CDPH-DDWEM)

From: Burton, Bruce (CDPH-DDWEM-NCDWFOB)
Sent: Thursday, May 22, 2014 4:56 PM
To: Frederick, Michelle (CDPH-DDWEM); Mazzera, David (CDPH-DDWEM); Reese, Lance (CDPH-DDWEM); Tran, Dat (CDPH-DDWEM); Cajina, Stefan (CDPH-DDWEM)
Cc: Kinney, Brian (CDPH-DDWEM); Garrett, James (CDPH-DDWEM); Novak, Anne (CDPH-DDWEM); Ziese, Joshua (CDPH-PS-DDWEM); Hearne, Thera (CDPH-DDWEM); Okeke, Sylvester (CDPH-PS-DDWEM); Hartwell, Seresa (CDPH-DDWEM); Pang, Maria (CDPH-DDWEM); DWPFUNDS (CDPH-PS-DDWEM); Wildflower, Joy (CDPH-DDWEM); Schott, Guy (CDPH-DDWEM)
Subject: RE: Redwood Valley CWD PWSDE app

I have reviewed this PWSDE memo and approve the project for funding.

Bruce

-----Original Message-----

From: Frederick, Michelle (CDPH-DDWEM)
Sent: Thursday, May 22, 2014 4:42 PM
To: Mazzera, David (CDPH-DDWEM); Reese, Lance (CDPH-DDWEM); Tran, Dat (CDPH-DDWEM); Burton, Bruce (CDPH-DDWEM-NCDWFOB); Cajina, Stefan (CDPH-DDWEM)
Cc: Kinney, Brian (CDPH-DDWEM); Garrett, James (CDPH-DDWEM); Novak, Anne (CDPH-DDWEM); Ziese, Joshua (CDPH-PS-DDWEM); Hearne, Thera (CDPH-DDWEM); Okeke, Sylvester (CDPH-PS-DDWEM); Hartwell, Seresa (CDPH-DDWEM); Pang, Maria (CDPH-DDWEM); DWPFUNDS (CDPH-PS-DDWEM); Wildflower, Joy (CDPH-DDWEM); Schott, Guy (CDPH-DDWEM)
Subject: Redwood Valley CWD PWSDE app

Attached please find the PWSDE application for Redwood Valley County Water System in Mendocino County. Stefan has reviewed and initialed the original document. If you have any questions, do not hesitate to contact me.

Thanks,
Michelle

Michelle Floyd Frederick, P.E.
District Engineer—Mendocino District
California Department of Public Health - Drinking Water Program
50 D Street, Suite 200
Santa Rosa, CA 95404
Phone: (707) 576-2731 Fax: (707) 576-2722 michelle.frederick@cdph.ca.gov