

RECLAMATION

Managing Water in the West

Final Environmental Assessment/Initial Study and Finding of No Significant Impact/Mitigated Negative Declaration

Anderson-Cottonwood Irrigation District Integrated Regional Water Management Program – Groundwater Production Element Project



**U.S. Department of the Interior
Bureau of Reclamation
Mid Pacific Region
Sacramento, California**



**Anderson-Cottonwood Irrigation District
2810 Silver St.
Anderson, CA 96007**

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Final Environmental Assessment/Initial Study

Anderson-Cottonwood Irrigation District Integrated Regional Water Management Program – Groundwater Production Element Project

This Final EA/IS has been prepared by Reclamation and ACID pursuant to the requirements of NEPA and CEQA. This Final EA/IS incorporates, by reference, the Anderson-Cottonwood Irrigation District Integrated Regional Water Management Program – Groundwater Production Element Project Draft Environmental Assessment/Initial Study (Draft EA/IS), dated August 2011. This document is a continuation of the Draft EA/IS, and these documents together constitute the Finding of No Significant Impact and Mitigated Negative Declaration.

Reclamation and ACID released a Draft EA/IS for a 30-day public review period from August 30 through September 30, 2011. Comments were received and are included as Attachment 1. All changes to the Draft EA/IS in response to comments are presented below in Section 8. Responses to comments are presented in Section 9. This Final EA/IS incorporates the Draft EA/IS by reference. This document will be used by Reclamation to support a Finding of No Significant Impact and by ACID to support a Mitigated Negative Declaration under NEPA and CEQA, respectively.

8. Changes to the Draft EA/IS

This section of the Final EA/IS includes additions, deletions, and corrections to the Draft EA/IS. These changes were made in response to comments that were received (see Section 9).

Changes to Acronyms and Abbreviations

1. Page viii, change “Integrated Regional Water Management Plan” to “Integrated Regional Water Management Program”
2. Page viii, change “State Historic Preservation Office” to “State Historic Preservation Officer”

Changes to Section 1

1. Page 1-1, Section 1.1, Background, first paragraph, line 10, change the word “Plan” to “Program”
2. Page 1-1, Section 1.1, Background, first paragraph, add the following sentence after “proponent.”: “Any existing or future project facilities that have been or will be constructed using Proposition 50 grant funds, and that operate for purposes other than supplementing a given district’s water supply sources (such as a water transfer), would need to be evaluated further to assess potential impacts from the revised project purpose (once such actions are fully defined) and must comply with both NEPA and CEQA.”
3. Page 1-1, Section 1.1, Background, last paragraph, line 3, change “125,000 acre-feet” to “128,000 acre-feet”
4. Page 1-1, Section 1.1, Background, last paragraph, line 4, change “4,000 ac-ft” to “7,000 ac-ft”
5. Page 1-1, Section 1.1 Background, last paragraph, line 4, add the following sentence after “water.”: “3,000 ac-ft of ACID’s project water supply was permanently reassigned to Reclamation, resulting in a total supply of 125,000 ac-ft per year.”
6. Page 1-2, Section 1.3.1, Purpose and Need, first paragraph, last sentence, remove “Sacramento Valley IRWMP revision and” and replace with “project”.
7. Page 1-5, Section 1.4, Applicable Regulatory Requirements and Required Coordination, bullet item 4, change “State Historic Preservation Office” to “State Historic Preservation Officer”.

Changes to Section 3

1. Page 3-29, Section 3.4.2.3, Proposed Action, first paragraph, line 8, add the following word after “would be”: “adversely”.

9. Responses to Comments

Five comment letters pertaining to the Anderson-Cottonwood Irrigation District Integrated Regional Water Management Program – Groundwater Production Element Project (proposed action/proposed project) were received. The letters are numbered one to five, based on the chronological order that each letter was received. Following is a summary of the specific comments that were received, with responses to the comments. Copies of all letters received are included in Attachment 1.

Letter 1

California Department of Public Health – Health and Human Services, addressed to ACID, dated September 9, 2011

This comment letter includes additional email correspondence documentation between Public Health and ACID.

Comment 1-1:

The California Department of Public Health (CDPH), Environmental Review Unit (ERU) is in receipt of the Draft Environmental Assessment/Initial Study and Finding of No Significant Impact/Mitigated Negative Declaration for the above project. The CDPH, Division of Drinking Water and Environmental Management is responsible for issuing water supply permits administered under the Safe Drinking Water Program and will need to issue a new or amended Water Supply Permit for the above referenced project. A project triggers a permit if it includes changes to the water supply, shortage, treatment of drinking water or consolidation of one or more public water systems. CDPH will be a “responsible agency” pursuant to the California Environmental Quality Act (CEQA) and considers the above referenced document as adequate to meet the CDPH CEQA permit requirements.

Response 1-1:

The ACID Integrated Regional Water Management Program – Groundwater Production Element Project proposes to install two groundwater wells for agricultural use only. These wells would not be used to provide potable water; therefore, the proposed action/proposed project is not subject to a Water Supply Permit from CDPH (this was confirmed with CDPH in the attached email dated September 12, 2011).

Letter 2

California State Water Resources Control Board, addressed to ACID, dated September 14, 2011

This comment letter includes two enclosures titled, “Basic Criteria for Cultural Resources Reports” and “Instructions and Guidance for ‘Environmental Compliance Information’.”

Comment 2-1:

We have received a copy of the District's draft Initial Study and Mitigated Negative (IS/MND) from the State Clearinghouse for the Project. Since the Project may be eligible for CWSRF [Clean Water State Revolving Fund] financing, the State Water Resources Control Board (State Water Board) is providing some information on the environmental review requirements of the CWSRF Program should you decide to pursue CWSRF financing in the future.

Response 2-1:

ACID will not be pursuing CWSRF financing. No further response is necessary.

Letter 3**California Department of Transportation, addressed to ACID, dated September 27, 2011****Comment 3-1:**

Caltrans has concerns with the proposed location of Well Number 1 in proximity to the I-5 interchange. Caltrans has worked with the City of Anderson for many years to develop a two-phase interchange project for the long-term operation of the interchange. Phase 1 involves adding a northbound offramp and a roundabout on the east side of the interchange. Phase 2 would add a roundabout to the west side and would change the offramp alignment. This project raises concerns regarding the proposed well location in relation to the offramp re-alignment. Caltrans requests that the ACID work with Caltrans and the City of Anderson to determine a location that would minimize the impacts to the future interchange project.

Response 3-1:

ACID is aware of the proposed offramp realignment near the site for Well No. 1 and has taken this into consideration for final placement of the well.

The Draft EA/IS allows for placement of the well within the current boundaries of the owner's parcel, which provides for adjusting its placement to avoid proximity to the planned offramp realignment. No impacts on the future interchange project should result with placement of the well outside the anticipated highway right-of-way.

Letter 4**AquAlliance, addressed to Bureau of Reclamation and ACID, dated September 28, 2011****Comment 4-1:**

Please provide AquAlliance with an explanation of the "SVIRWMP" revision(?) that is planned or required for the Project. FONSI at p.2, EA/ FONSI/IS/MND at p. 1-2. AquAlliance requests notification of changes made to the SVIRWMP.

Response 4-1:

The sentence on p.1-2 has been revised as identified in Section 8, Changes to the Draft EA/IS, to clarify that Reclamation is providing funding to assist with implementation of the

proposed project, not for revisions to the program. No revisions to the program are required as part of the proposed project; rather, the proposed project is in line with the purpose of the program.

Comment 4-2:

The Bureau of Reclamation's draft environmental review of the Project does not comply with the requirements of National Environmental Policy Act ("NEPA"), 42 U.S.C. §4321 *et seq.* The Bureau's reliance on the EA alone violates NEPA requirements because, among other things, the EA fails to provide a reasoned analysis and explanation to support the Bureau's proposed finding of no significant impact (FONSI). The EA alternatives analysis is fundamentally flawed and the treatment of the chain of cause and effect extending from project implementation leads to an inadequate analyses of nearly every resource, growth inducing impacts, and cumulative impacts.

Response 4-2:

The Draft EA/IS satisfies NEPA requirements. According to the Department of the Interior NEPA Regulations (Section 46.310), when the Responsible Official determines that there are no unresolved conflicts about the proposed action with respect to alternative uses of available resources, the Draft EA/IS need only consider the proposed action and proceed without consideration of additional alternatives. The proposed action does not constitute a major federal action that would result in significant impacts. Additionally, the Draft EA/IS provides a thorough and systematic evaluation of a broad range of environmental issues and concludes that no potentially significant impacts would occur as a result of the proposed action/proposed project.

Comment 4-3:

Second, the EA/ FONSI/IS/MND does not benefit from programmatic NEPA and CEQA review for the SVIRWMP or the Sacramento Valley Water Management Agreement (SVWMA) (Plans). This leaves the Project and all other SVIRWMP and SVWMA projects without the ability to tier from the larger project plan's environmental review. An EIS/EIR for the SVIRWMP and the SVWMA would afford the Bureau, DWR, the State Water Resources Control Board, and the California public clearer insight into how, where, and why the SVIRWMP and the individual component projects are needed. The Project's draft EA/ FONSI/IS/MND as released this month fails to provide adequate disclosure of significant impacts from the Project and in conjunction with the numerous other projects that are part of the SVIRWMP and the SVWMA.

CEQA requires lead agencies in California to prepare a detailed environmental impact report when a project has the potential to have a "Significant effect on the environment [that] means a substantial, or potentially substantial, adverse change in the environment... ."(?) (§ 21068; see *Dehne v. County of Santa Clara* (1981) 115 Cal.App.3d 827, 843-844 [171 Cal.Rptr. 753]) (Pub. Res. Code §§ 21100, 21151; 14 Cal. Code Regs., §§15064(a)(1), (f)(1).), DWR has failed to produce or require programmatic environmental review for the SVWMA or the SVIRWMP.

Response 4-3:

As stated in Section 1.1 of the Draft EA/IS, the proposed project is supported by both state and federal grant funding. Although the other projects funded by these grants are generally similar in nature, each project has independent utility, is not associated with a larger

program, and will be implemented by each grantee to supplement their current surface water supplies in both normal and dry years, as determined appropriate by each project proponent. All potentially significant impacts are disclosed in the Draft EA/IS, and mitigation is identified as necessary and required to ensure that residual impacts are less than significant.

Comment 4-4:

As demonstrated in these comments, a negative declaration is not the appropriate level of review required for the Project (Laurel Heights Improvement Association v. Regents of the University of California, 1988, 47 Cal.3d 376). The lead agencies have failed to take a hard look at the environmental impacts of the Project. The conclusion reached in the CEQA check list, "The proposed avoidance and minimization measures would reduce the overall impact on the proposed project to a level of less than significant," fails on its face as substantial questions remain unanswered throughout the EA/ FONSI/IS/MND. For example, the Project's proposed aquifer extractions may have significant effect on the region's environmental and hydrological conditions yet there is no discussion or mitigation provided for review and the "monitoring and remedial action plans" are not provided.

Response 4-4:

See Responses to Comments 4-2, 4-3, 4-11, 4-17, 4-18, and 4-19.

Comment 4-5:

In addition, there are also substantial questions about whether the Project will have significant adverse environmental impacts when considered in conjunction with the other related water projects underway and proposed in the region. The Bureau and ACID simply cannot, consistent with NEPA and CEQA, allow these foreseeable environmental impacts to escape full analysis in an EIS/EIR of some kind, either programmatic or project specific.

Response 4-5:

The cumulative analysis as presented in Section 3.1.2.5 of the Draft EA/IS is appropriate given the lack of other known and approved groundwater development projects anticipated within the project vicinity and the Redding Groundwater Basin. Because the Redding Groundwater Basin is hydraulically separated from the Sacramento Valley Groundwater Basin, potential groundwater-related impacts associated with the proposed project and other known projects in the basin would be limited to the Redding Groundwater Basin.

See Response to Comment 4-2 regarding the sentence about the level of environmental analysis and documentation, as well as Response to Comment 4-3.

Comment 4-6:

The EA/ FONSI/IS/MND is a part of numerous plans, grants, and agreements. Installing new wells for production is part of the Sacramento Valley Water Management Agreement--Implementation of Short-term Projects, which is a massive project with significant impacts. This alone illustrates that the Project is part of a larger project that has not been reviewed programmaticaly under NEPA and CEQA, but as stated above, ACID is party to it and the Project is funded through another plan that failed to conduct NEPA or CEQA review: the SVIRWMP.

Response 4-6:

The Draft EA/IS was written to serve as a site-specific environmental analysis to disclose impacts directly associated with the groundwater well production project. This proposed project is not affiliated with the SVWMA. As stated in Section 1.1, Background (page 1-1), of the Draft EA/IS, "Although the projects funded by this grant are generally similar in nature, each project has independent utility, and will be implemented by each grantee to supplement their current surface water supplies in both normal and dry years, as determined appropriate by each project proponent." See Response to Comment 4-3.

Comment 4-7:

The SVWMA and the SVIRWMP moved ACID and other Settlement Contractors forward into the lucrative water selling market. During the 2009 drought, ACID managed to sell water to Shasta Lake City, Bella Vista, Shasta Community Services District, and Kanawha Water District. The Plans goals require districts to incorporate ground water use into their operations, so that more water is available for junior water rights holders south of the Delta. Just how other northstate water dependent farms, businesses, residents and flora and fauna will be impacted has *never* been fully explored.

Response 4-7:

The purpose of the SVIRWMP is to provide a regional framework to assist in managing all aspects of water resources. The program provides for many funding opportunities to implement several types of projects to achieve this goal; however, it does not promote the "selling" of water, as the commentor suggests. The Central Valley Project Improvement Act (CVPIA) provides for the transfer of that portion of a Settlement Contractor's contract total known as Project water. ACID has provided all or some portion of its Project water (4,000 acre-feet), which is in excess of the base supply, to other agencies pursuant to provisions of the CVPIA when the District has determined that such water is available. ACID entered into long-term agreements with the City of Shasta Lake and Shasta Community Services District in 2005, and signed a Letter of Agreement with Bella Vista Water District for the same purpose in 2008. In 2008 and 2009, ACID provided Project water to Kanawha Water District when that district was facing supply shortages. All water transfer agreements were in full compliance with NEPA and CEQA requirements. There is no intent to transfer water as part of the proposed action/proposed project; see also Response to Comment 4-10 and revision to the Draft EA/IS in Section 8 (Changes to Section 1, No. 2).

Comment 4-8:

The draft EA/ FONSI/IS/MND suggests that the purpose and need for the project stems from the 2004, 40-year Settlement Contract that was renegotiated between the Bureau and ACID that lead to a loss of 44,000 acre-feet (AF) per year to the district. ACID's water delivery systems also present the district with challenges. If the intent is to provide "help with the flexibility and reliability required to meet agricultural water needs" as stated on page 1-2, there are numerous alternatives that have not been explored.

Response 4-8:

As stated in Section 1.3, Purpose and Need and Project Goals and Objectives (page 1-2), of the Draft EA/IS, "The purpose of the proposed project is to augment surface water supplies by installing and operating two groundwater production wells." The need for the project is to "improve flexibility and reliability of the District's water supply." See Response to Comment 4-2.

Under the SVIRWMP grants program, Reclamation provides financial assistance to support activities that promote the preparation and revision of written regional water management and conservation plans, implement activities identified in written water management plans, demonstrate new or previously unknown water management technologies and practices, and promote improved understanding of good water use practices and principles. ACID is currently exploring other system improvement and management opportunities to pursue under the SVIRWMP grants program to assist in improving flexibility and reliability in water management programs for the District.

Comment 4-9:

Also undisclosed in the draft EA/FONSI/IS/MND is that during the 2009 drought, ACID managed to sell water as mentioned above. This does not appear to be a district that needs more water for its own operations, but rather to assist the Bureau, DWR, and other local agencies meet their wishes or demands.

Response 4-9:

See Response to Comment 4-7. Project water is only available for diversion by ACID during the months of July and August, and has only been made available in years where other districts have incurred significant water cutbacks and ACID determined their own water needs could be met. ACID will continue to assist other districts while making sure their own customers' water needs are met.

Comment 4-10:

The draft EA/FONSI/IS/MND fails to mention the emphasis found in state and federal law protecting third parties from injury that emanates from water transfers. While the lead agencies may not recognize the connection between the Project and water transfers, to AquAlliance the association is clear. ACID entered the water marketing business through its adoption of both the SVWMA and the SVIRWMP and its activities. As noted above, in 2009 alone, ACID entered into agreements to transfer water to Shasta Lake City, Bella Vista, Shasta Community Services District, and the Kanawha Water District. The draft EA/FONSI/IS/MND fails to disclose how the lead agencies will protect third parties, including the environment, from new ground water pumping and transfers.

Response 4-10:

The purpose of the proposed action/proposed project, as stated in Section 1.3, Purpose and Need and Project Goals and Objectives (page 1-2), of the Draft EA/IS is to "augment [ACID's] surface water supplies." There is no intent to transfer water as part of this proposed project. See Section 8, Changes to the Draft EA/IS.

Comment 4-11:

Liability is a crucial component of potential third party impacts. The draft EA/FONSI/IS/MND does not reveal any information about the current status of the ground water basin, which indicates that there is not enough known about the aquifer to judge liability for damage from pumping. How will the lead agencies rectify this for other ground water dependent users and the environment?

Response 4-11:

Section 3.1, Water Resources (pages 3-1 through 3-13), and Appendices D and E of the Draft EA/IS provide a thorough description of the subject area's water resources, including the

hydrology, hydrogeology, water use, land subsidence, and groundwater quality and anticipated impacts. As stated in Section 3.1, ACID installed 12 monitoring wells in 2003 and one additional monitoring well in 2005. The California Department of Water Resources (DWR) has been monitoring groundwater levels at these and other wells since the mid-2000s, and the data are publicly available at <http://www.water.ca.gov/waterdatalibrary/>. DWR plans to continue monitoring these wells into the foreseeable future, and data that result from ongoing monitoring activities will continue to be publicly available.

Comment 4-12:

The No Action Alternative is the only alternative named in the documents. AquaAlliance finds this alternative poorly defined and the absence of any other alternatives troubling for many reasons.

The No Action Alternative fails to explain what are the implications of this alternative beyond the potential of a 25 percent cutback in base (121,000 AF) and project water (4,000 AF) supply in critically dry years. p. 2-1 More information must be provided, such as how often has ACID had such cutbacks in the last 30 years? How large were the actual water shortages? How did ACID handle this in the past and what were the implications for ACID members?

Response 4-12:

ACID has experienced curtailments by Reclamation three times (1991, 1992, and 1994) over the last 30 years, resulting in the availability of 75 percent of both base supply and project water. These shortages occurred under ACID's original contract with Reclamation (165,000 acre-feet per year). During these cutbacks, the monthly allotted supply was inadequate for the acreage being irrigated. This shortfall was managed by reducing the total amount of irrigated acreage within the service area, which resulted in financial hardship and significant long-term crop impacts on District customers.

As stated in Section 1.3, Purpose and Need and Project Goals and Objectives (page 1-2), in the Draft EA/IS, ACID underwent contract renegotiation in 2004 with Reclamation that resulted in a reduction of 47,000 acre-feet of ACID's contract supply, resulting in a revised contract supply of 128,000 acre-feet per year. Additionally, 3,000 acre-feet of ACID's Project supply was permanently reassigned to Reclamation, resulting in a total reduction of 50,000 acre-feet per year. Under ACID's current contract, during a year of curtailment, ACID would be allotted a total of 93,750 acre-feet of water. This quantity of water would be insufficient to meet water needs in a drought year. Considering past occurrences, future cutbacks would result in financial hardship and significant long-term crop impacts on customers in the District's service area. The proposed project, as stated in Section 1.3.1, Purpose and Need, of the Draft EA/IS would provide for additional supply flexibility, particularly during years where ACID's total supply is curtailed in drought years.

Comment 4-13:

The No Action Alternative acknowledges that the surrounding land use will become more urban and that ground water will be an important water source for the future residents. p. 2-1. There isn't any discussion in this section of the significance of ACID becoming a new ground water user in the region or how it will affect the present and future users in the region. The analysis provided in Section 3 is minimal at best and basically concludes that

there are no impacts from the Project except during construction. This significantly stretches the lead agencies' credibility.

Response 4-13:

Section 3.1, Water Resources (pages 3-1 through 3-13), in the Draft EA/IS and Appendices D and E provide a complete and thorough description of anticipated impacts on groundwater resources associated with the proposed action/proposed project.

Comment 4-14:

The absence of any other alternatives makes the EA/FONSI/IS/MND completely inadequate. On page 1-1, the Purpose and Need section highlights the potential for many other management and supply options by explaining that, "... the west side of the District's system has little to no downstream control. Control of the system is achieved at the head of the 35-mile main canal, causing some delivery difficulties at the downstream end of the service area. By pushing water from upstream to downstream without an ability to manage intermediate water surface elevations, downstream response time to water delivery needs can be greatly hindered." The Background section also points out that, "When flow exceeds the canal capacity, ACID water overflows into several wasteways along the canal route." draft EA/FONSI/IS/MND at p.1-1. To "improve the flexibility and reliability of the District's water supply" ACID could make system improvements, pursue conservation, and establish regional transfers between CVP contractors and other regional water purveyors without incorporating ground water into their operations. These are viable alternatives that are discussed in the SVIRWMP (pp. 6-10), but have been ignored here.

Response 4-14:

As previously discussed, ACID is currently exploring other system improvement and management opportunities to pursue under the SVIRWMP grants program to assist in improving flexibility and reliability in water management programs for the District in addition to the proposed project. See Responses to Comments 4-2 and 4-8.

Comment 4-15:

One remaining alternative is to renegotiate the contract that ACID has with the Bureau.

Response 4-15:

As stated in the first sentence of the purpose and need statement on page 1-2 of the Draft EA/IS, the purpose of the proposed action is to "augment surface water supplies by installing and operating two groundwater production wells." As also stated in the first sentence of the second paragraph under Section 1.3.1, Purpose and Need, the "project would improve the flexibility and reliability of the District's water supply." Renegotiating the contract between ACID and Reclamation would not assist in meeting either the purpose or need. ACID completed the renegotiation of their Sacramento River Settlement Contract after many years of discussion with Reclamation in 2005, as did many other water districts. ACID's settlement contract is not up for renewal until 2045. During the renegotiation process, Reclamation determined through a water needs analysis that ACID's water needs had decreased. This determination resulted in a decreased water supply to ACID and, ultimately, its customers. This decreased supply is the basis of the proposed project, as made clear in the purpose and need statement.

Comment 4-16:

There are only two alternatives presented here: the No Action and the Proposed Action.

The lack of *any* alternative action proposal is unreasonable and is by itself a violation of NEPA's requirement to consider a reasonable range of alternatives.

Response 4-16:

See Responses to Comments 4-8 and 4-15.

Comment 4-17:

Page 2-7 states that the wells capacities will be 3,500 gallons per minute. At the 24 hour pumping rate that is expected, that equates to 15.46 acre-feet per day and 2,365 acre-feet for one well from the June to October period (noncritical scenario) of expected operation. In the critical scenario with both wells pumping from April to October, the expected output would be 6,617 acre-feet. As a new extractor of ground water, what are ACID's "monitoring and remedial action plans," that are mentioned on page 2-7? How is the public to know if the plans are adequate or not when no detail is provided?

Response 4-17:

DWR has been monitoring groundwater activity in the Redding Groundwater Basin as well as the ACID monitoring wells for several years, and they will continue monitoring into the foreseeable future. All monitoring information is publicly available at the following DWR Web site: <http://www.water.ca.gov/waterdatalibrary/>. ACID will use this information to monitor activity in the aquifer during periods of pumping.

Additionally, Section 2, Environmental Commitments Incorporated into the Proposed Action/Proposed Project (page 2-7), of the Draft EA/IS, states, "Upon notification of a potential adverse impact, ACID would (within 5 days) contact the affected party and obtain available information as to the nature and extent of the potential impact. After the party has been contacted and relevant information received regarding the potential impact, ACID would evaluate whether an impact had actually occurred and whether the impact appears related to operation of the ACID project. ACID would then take one of the following actions:

- If ACID and affected party mutually determine that the reported adverse impact resulted from implementation of the project, ACID would mitigate the impact in a mutually agreeable manner, possibly including a temporary reduction in groundwater pumping.
- If ACID determines that the reported impact was not likely caused by implementation of the project, then ACID would provide information to the affected party that reasonably demonstrates the lack of causation between the specific project and the reported impact."

Comment 4-18:

Page 3-5 Subsidence. "Land subsidence has never been monitored in the RGB, but is expected to be small, given the lack of chronically depressed groundwater levels and because the current magnitude of groundwater pumping in the basin represents a very small fraction of the amount of water available for groundwater recharge." If subsidence has not been monitored in the Redding Ground Water Basin, the assertions contained in the quotation above are without merit and the NEPA and CEQA analysis inadequate.

Response 4-18:

In Section 3.1.1.4 of the Draft EA/IS, it is acknowledged that land subsidence monitoring data are not available for the Redding Groundwater Basin. However, overdraft of aquifers is the primary cause of irreversible groundwater-related land subsidence to occur, especially in aquifers with substantial fine-grained interbed deposits. As projected using the REDFEM model, the forecast incremental drawdown that would result from implementation of the proposed action/proposed project would not cause an overdraft to the prolific aquifer underlying the proposed sites.

According to Table D-1 in Appendix D of the Draft EA/IS, which summarizes the average annual groundwater balance for calendar years 1999 through 2008 in the REDFEM domain (including the Redding Groundwater Basin), the average annual groundwater inflows were approximately 811,000 acre-feet. During noncritical water years, ACID Well No. 1 would not operate, and ACID Well No. 2 would yield up to approximately 2,350 acre-feet of groundwater per year, which is less than 1 percent of the average annual groundwater inflows over calendar years 1999 through 2008. During critical water years, operation of ACID Wells No. 1 and 2 would yield approximately 6,600 acre-feet of groundwater per year, which is also less than 1 percent of the average annual groundwater inflows over calendar years 1999 through 2008. Thus, the proposed action/proposed project would not cause an overdraft of the aquifer, and project-related land subsidence is not anticipated.

Comment 4-19:

Page 3-5 to 3-6 Assessment Methods. "Therefore, the approach for forecasting groundwater-level impacts of the proposed action includes evaluating the incremental drawdown at distances of 0.25 mile and greater from a proposed project well." AquAlliance questions the selection of only .025. In production well tests conducted in Glenn County in 2007 indicated that the recharge source for the solitary production well "is most likely from the foothills and mountains, to the east and north" – which at a minimum is more than fifteen miles away. (DWR, Glenn-Colusa Irrigation District Aquifer Performance Testing Glenn County, California).

Response 4-19:

The selection of forecasting impacts at no less than 0.25 mile, as stated in Section 3.1.3 of the Draft EA/IS, is as follows, "Pre-existing municipal and industrial (M&I) production wells are typically spaced no closer than 0.25 mile near the proposed pumping locations. It is assumed in this evaluation that proposed well locations are also at least 0.25 mile from any active pre-existing M&I production wells. Therefore, the approach for forecasting groundwater-level impacts of the proposed action includes evaluating the incremental drawdown at distances of 0.25 mile and greater from a proposed project well."

The REDFEM domain encompasses the entire Redding Groundwater Basin. Because no third-party groundwater pumpers are known to be located closer than 0.25 mile from the proposed action/proposed project pumping locations, the forecast incremental drawdowns were summarized for distances no closer than 0.25 mile from these project locations. This assessment approach does not infer that recharge would only occur within 0.25 mile of the proposed well, as the commentor suggests.

Comment 4-20:

The draft EA/FONSI/IS/MND does not, as we have mentioned repeatedly, reveal that the current Project is part of the much larger set of Plans to develop ground water in the region, to develop a “conjunctive” system for the region, and to integrate northern California’s ground water into the state’s water supply. These are plans that the Bureau, DWR, and others have pursued and developed for many years. Indeed, one of the plans — the short-term phase of the SVWMA — is still the subject of an ongoing scoping process for a Programmatic EIS/EIR dating back to 2003.

Response 4-20:

As previously stated, Section 1.1, Background (page 1-1), of the Draft EA/IS states that “Although the projects funded by this grant are generally similar in nature, each project has independent utility, and will be implemented by each grantee to supplement their current surface water supplies in both normal and dry years, as determined appropriate by each project proponent.” See Response to Comment 4-3.

Comment 4-21:

In assessing the significance of a project’s impact, the Bureau must consider “[c]umulative actions, which when viewed with other proposed actions have cumulatively significant impacts and should therefore be discussed in the same impact statement.” 40 C.F.R. §1508.25(a)(2). A “cumulative impact” includes “the impact on the environment which results from the incremental impact of the action when added to *other past, present and reasonably foreseeable future actions* regardless of what agency (Federal or non-Federal) or person undertakes such other actions.” *Id.* §1508.7. The regulations warn that “[s]ignificance cannot be avoided by terming an action temporary or by breaking it down into small component parts.” *Id.* §1508.27(b)(7). However, because the lead agencies chose to look at only one component project here, they find that there are no cumulative impacts to water, land, agriculture, biological resources and sensitive species after construction, American Indian Trust Assets, Environmental Justice, Greenhouse Gas, pp. 3-13, 3-19, 3-26, 3-30, 3-32, 3-41.

An environmental impact statement should also consider “[c]onnected actions.” *Id.* §1508.25(a)(1). Actions are connected where they “[a]re interdependent parts of a larger action and depend on the larger action for their justification.” *Id.* §1508.25(a)(1)(iii). Further, an environmental impact statement should consider “[s]imilar actions, which when viewed together with other *reasonably foreseeable or proposed agency actions*, have similarities that provide a basis for evaluating their environmental consequences together, such as common timing or geography.” *Id.* §1508.25(a)(3) (emphasis added).

As presented above, instead of assessing the cumulative impacts of the proposed action as part of the larger program (SVWMA) that even the Bureau recognized should be subject to a programmatic EIS (but for which no programmatic EIS has been completed), the Bureau has attempted to separate the Project and approve it through an inadequate EA. Further, the Bureau has failed to take into account the cumulative effects of other ground water and surface water projects in the region, the development of “conjunctive” water systems, and the anticipated further integration of Sacramento Valley surface and ground water into the state water system.

The Ninth Circuit Court makes clear that NEPA mandates “a useful analysis of the cumulative impacts of past, present and future projects.” *Muckleshoot Indian Tribe v. U.S. Forest Service*, 177 F.3d 800, 810 (9th Cir. 1999). Indeed, “[d]etail is required in describing the cumulative effects of a proposed action with other proposed actions.” *Id.* The very cursory cumulative effects discussion contained in the EA plainly fails to meet this standard.

Response 4-21:

See Responses to Comments 4-3, 4-5, 4-6, and 4-10. The proposed action/proposed project is not being pursued as part of the SVWMA. The proposed action/proposed project is being funded by the SVIRWMP as administered by DWR.

The Draft EA/IS determines that the proposed action/proposed project would not contribute significantly to cumulative impacts; and Section 2, the Environmental Commitments Incorporated into the Proposed Action/Proposed Project, outlines avoidance and minimization measures that further reduce potential cumulative effects of the proposed action/proposed project.

Comment 4-22:

ACID should be prohibited from transferring water. It is one thing for a Settlement Contractor to sell its surface water, as it did in 2009 (a drought year), to help its neighbors. It is quite another to tap into an aquifer and begin using a common resource for private gain and undisclosed growth inducing and cumulative impacts.

Response 4-22:

See Responses to Comments 4-2, 4-5, 4-7, 4-9, 4-10, 4-11, and 4-21 and Section 8, Changes to the Draft EA/IS.

Comment 4-23:

The monitoring and remedial action plans must be based on the hydrology of the region, not ACID’s boundaries or simply modeling and include:

- Ground water levels in at least a seven-mile radius to start, with adaptive adjustments possible in five year increments.
- Water quality data
- Environmental conditions including:
 - Baseline conditions for a minimum of five years before the wells may be used documenting seasonal tributary flows, subsidence, extant flora and fauna, and conditions for reproductive success and maturity.
 - If the Project is implemented, the monitoring must continue for seasonal tributary flows, subsidence, extant flora and fauna, and conditions for reproductive success and maturity.
 - The monitoring and remedial action plans results must be readily available on the ACID web site with real time monitoring posted daily during months of pumping.

Response 4-23:

See Response to Comment 4-17.

Letter 5

City of Anderson, sent via email to ACID, dated September 30, 2011

The email contained a memorandum from Pace Engineering as an attachment titled, "Draft Environmental Assessment/Initial Study Integrated Regional Water Management Program-Groundwater Production Element Project – PACE Comments for the City of Anderson."

Comment 5-1:

Given the apparent poor efficiency (less than 65 percent) of the current ACID canal system to deliver water to its customers, we would recommend that the IRWMP report compare the overall socioeconomic impact of the proposed well project versus having ACID repair the existing canal system. For example, comparing the long-term electrical well pumping costs that would be wasted for using the proposed wells versus the costs of repairing the leaking canal system.

Response 5-1:

As stated in Section 1.3, Purpose and Need and Project Goals and Objectives (page 1-2), of the Draft EA/IS, "The purpose of the proposed action is to augment surface water supplies by installing and operating two groundwater production wells." The need for the proposed project is to "improve flexibility and reliability of the District's water supply." The use of groundwater to augment the District's surface supply provides flexibility in the timing of such water use; such flexibility is not provided by canal lining conservation. The commentor suggests that lining the canal would be considered a "repair"; however, lining an earthen canal is not a "repair" but rather an improvement to the existing system. Lining an earthen canal is not only prohibitively expensive, but at this time, a funding source is not currently available. ACID is currently exploring other system improvement and management opportunities to pursue under the SVIRWMP grants program to assist in improving flexibility and reliability in water management programs for the District.

Comment 5-2:

The use of NSF (National Sanitation Foundation) and State Health Department approved drilling fluids would be required when drilling the proposed wells in order to avoid contaminating groundwater in close proximity to existing municipal wells. See Page B-2.

Response 5-2:

Project wells would be installed in accordance with relevant federal, state, and county laws and ordinances.

Comment 5-3:

Due to the close proximity of the proposed ACID Well No. 1 with other City municipal wells, the construction of the ACID Well should be per the Shasta County Health Department well construction standards for a potable water well (see Page B-2). The well should be chlorinated and tested in order to assure that no contaminants have entered the aquifer.

Response 5-3:

See Response 5-2.

Comment 5-4:

Based on the Report's Well Drawdown Analysis (Page 3-8) and finite element (REDFEM) analysis (Appendix D), it is estimated that the regional aquifer drawdown at the proposed ACID Well No. 1 site will be approximately 10 to 15 feet at the desired pumping rate of 3,500 GPM. The analysis also suggests that at 0.25 miles from the well, water table drawdown would be approximately 4.6 feet and at 0.5 miles the long term drawdown is estimated at approximately 3-feet. Currently, the City operates municipal Well No. 10 (i.e., Highway 273 Well) that is approximately 0.44 miles from the proposed ACID well site and Well No. 7 (Volonte Park Well) which is approximately 0.61 miles from the site.

The IRWMP report estimates that during the proposed ACID Well No. 1 operation, the expected long-term drawdown that would be seen at the City's Highway 273 facility would increase by about 3.2 feet and at the Volonte Well facility it is estimated that an additional 2 feet of drawdown can be expected. These increases in water table drawdown would ultimately increase pumping costs to the City (see IRWMP Page 3-38). The IRWMP estimates that for every 1-foot of drawdown added to an existing well pump the increase in electrical costs would be roughly \$0.38/Ac-Ft/ft.

Currently, April to October pumping volumes for the Highway 273 well are estimated at 271 Ac-Ft and the Volonte Well volume is 330 Ac-Ft. Using the IRWMP cost estimate the estimated added electrical costs that the City would be required to pay would be approximately \$330/year for City Well No. 10 and \$251/year for Well No. 7.

By comparison, a well drawdown pumping test performed by Lawrence and Associates in August 2005 for a high capacity potable water well (see attached Lawrence & Associates Test/Construction Well Installation and Testing, Vineyards of Anderson, Shasta County, California Figure 4) indicated that this well had a transmissivity (T) of 9.77×10^4 GPD/ft and a storage coefficient (S) of 1.0×10^{-4} . The test well is located approximately 1 mile from the proposed ACID Well No. 1 site. Using these test variables, we used the Cooper-Jacob Method to estimate drawdown at the Highway 273 Well (0.44 miles from the ACID Well No.1 site) during the pumping conditions of the proposed ACID Well No. 1 (3,500 GPM) for 200 consecutive days. Based on this analysis, we estimated that the drawdown at City Well No. 10 would be approximately 38 feet.

Obviously, if this increased drawdown condition were to occur, due to the proposed ACID well, the impact on the City wells would be much more significant than the IRWMP report estimates. For example, if an additional 38 feet were added to the current drawdown at City Well No. 10, the added electrical costs to operate this well, concurrently with the ACID well, would increase by about \$4,000 per year during critical dry years. In addition, if this drawdown condition did occur, other wells within the Anderson well system would also be affected including the Volonte Well (0.61 miles from the ACID well site), Balls Ferry Well (1.0 miles from the site) and possibly the Diamond St. Well and the North Street Well.

Obviously, these added pumping electrical costs, resulting from the operation of the proposed ACID well, will have to be verified. We recommend that the City review its current annual electrical pumping costs in order to define electrical usage per foot of drawdown at each well so that the City can evaluate specific financial impacts that may occur if the proposed ACID well is constructed. If it is determined that by constructing and

operating ACID Well No. 1 at the proposed site significantly increases electrical pumping costs to the City, ACID should be required to reimburse the City for these added costs.

Response 5-4:

The horizontal hydraulic conductivity (Kh) estimated by Lawrence and Associates at the referenced test well location is 73 feet per day. The Kh in REDFEM near the City of Anderson's Volonte Park (Well No. 7) and Highway 273 (Well No. 10) municipal wells is also approximately 70 feet per day. Thus, the simulated aquifer properties are consistent with the estimates provided by Lawrence and Associates in the vicinity of Wells No. 7 and 10.

The Cooper-Jacob method of analysis was used by the commentor to forecast the drawdown that may occur at Wells No. 7 and 10, as a result of operating ACID's Well No. 1 at 3,500 gallons per minute (gpm) for 200 days. This particular method of analysis assumes that the aquifer is homogeneous and isotropic, of uniform thickness, and receives no recharge from any source. It further assumes that all extracted groundwater comes from aquifer storage, the potentiometric surface has no slope, and the pumping well fully penetrates the aquifer. In reality, none of those assumptions are met. REDFEM is not restricted by these assumptions, which is why the forecast incremental drawdown values from REDFEM are less than those estimated using the Cooper-Jacob method. REDFEM accounts for more of the processes that would occur under operation of the proposed action/proposed project, as compared with the Cooper-Jacob method of analysis. Therefore, the maximum incremental drawdown as presented in the Draft EA/IS is adequate to assert that the resulting effect on pumping costs for neighboring groundwater users is minimal.

The use of groundwater exists as a "correlative" right in California, where the use of percolating water under "overlying land" is allowed subject to such uses being for beneficial use. The City, ACID, or any other user does not hold an exclusive right to extract groundwater from within a groundwater basin. All users contribute to drawdown and associated pumping costs; no user is entitled to any reimbursement due to changes in groundwater levels, assuming all users are putting extracted groundwater to beneficial use. As stated in Section 3.7, Socioeconomic Resources (pages 3-32 through 3-35), of the Draft EA/IS, the anticipated potential increase in pumping costs (less than 1 percent) "would not be expected to threaten the economic viability of crop production or adversely affect groundwater pumping for domestic use."

Comment 5-5:

Given this apparent variability of ground water hydrology, we would recommend that, as a part of the proposed project, ACID perform well pilot studies using small diameter pumping and monitoring wells at each well site to verify estimated hydraulic pumping conditions (i.e., drawdown rates, storage capacity, transmissivity, etc) prior to constructing the large and more expensive production wells. The results of these pilot studies should be made available to the City for their review in order to analyze what impact the proposed ACID wells would have on the City's local well system.

Response 5-5:

Section 3.1, Water Resources (pages 3-1 through 3-13), of the Draft EA/IS describes the subject area water resources, including the hydrology, hydrogeology, water use, land subsidence, and groundwater quality and anticipated impacts on these resources. Sufficient

evidence exists to support the assumption of available and adequate supplies to support the proposed action/proposed project; therefore, a pilot well study is not deemed necessary.

Comment 5-6:

If the project is implemented, ACID should consider notifying the City of Anderson when it is determined that DoR [sic] is declaring a critical dry year and that ACID will be operating their well facilities. Scheduling of the ACID well operations should be provided to the City in order for the City to monitor possible impacts on the City wells during ACID operations.

Response 5-6:

ACID agrees to notify the City of Anderson when Reclamation has declared a critically dry water year.

Comment 5-7:

All monitoring well data that was used in preparation of the IRWMP report should be made available to the City of Anderson for review and comparison. It is recommended that if the ACID well project is constructed, all ACID monitoring wells used for the IRWMP report continue to be monitored by ACID staff (especially those monitoring wells located within the City's sphere of influence) and that this well data be available to the City of Anderson for review to determine possible groundwater and City well impacts.

Response 5-7:

ACID installed 12 monitoring wells in 2003 and one additional monitoring well in 2005. DWR has been monitoring groundwater levels at these and other wells since the mid-2000s, and the data are publicly available at <http://www.water.ca.gov/waterdatalibrary/>. Thus, baseline groundwater levels in the ACID area are available. It is our understanding that DWR also plans to continue monitoring these wells into the foreseeable future, so there is some monitoring infrastructure already in place, and data that result from ongoing monitoring activities are publicly available.

Attachment 1
Comments



RON CHAPMAN, MD, MPH
Director

State of California—Health and Human Services Agency
California Department of Public Health



EDMUND G. BROWN JR.
Governor

September 9, 2011

Anderson-Cottonwood Irrigation District
Stan Wangberg
2810 Silver Street
Anderson, CA 96007



RE: A.C.I.D Integrated Regional Water Management Program – Groundwater
Production Element – SCH#2011082076

Dear Mr. Wangberg:

The California Department of Public Health (CDPH), Environmental Review Unit (ERU) is in receipt of the Draft Environmental Assessment/Initial Study and Finding of No Significant Impact/Mitigated Negative Declaration for the above project. The CDPH, Division of Drinking Water and Environmental Management is responsible for issuing water supply permits administered under the Safe Drinking Water Program and will need to issue a new or amended Water Supply Permit for the above referenced project. A project triggers a permit if it includes changes to the water supply, storage, treatment of drinking water, or consolidation of one or more public water systems. CDPH will be a “responsible agency” pursuant to the California Environmental Quality Act (CEQA) and considers the above referenced document as adequate to meet the CDPH CEQA permit requirements.

1-1

The proposed project consists of 2 groundwater wells each with an estimated well depth of 500 feet. Each well would have an estimated capacity of 3,500 gpm with a 100- to 150-horsepower pump motor. A maximum of 100 feet of conveyance piping, 12 to 14 inches in diameter would be installed approximately 12 to 24 inches underground at each well. The pipeline would discharge directly into the ACID main canal via open-ended discharge through the canal bank. Well No. 1 is proposed to be located in the City of Anderson and Well No. 2 is proposed to be located 0.5 mile northwest of the town of Cottonwood.

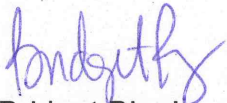
When the review process has ended, please forward the following items with your permit application to the CDPH Lassen District Office:

- Copy of the resolution/minutes adopting and approving the Draft Environmental Assessment/Initial Study and Finding of No Significant Impact/Mitigated Negative Declaration;

- Copy of the stamped Notice of Determination (NOD) filed at the Shasta County Clerk's Office (Note: The NOD must be submitted to the State Clearinghouse as well);
- Copy of the California Department of Fish and Game receipt issued by the Shasta County Clerk's Office or State Clearinghouse;
- Copies of any comment letters received locally or through the State Clearinghouse.

Please contact Michael McNamara of the Lassen District Office at (530) 224-4800, for information on the water supply permit application process. If you have any questions about this letter, please call me at (916) 552-9999 or email at Bridget.binning@cdph.ca.gov

Sincerely,



Bridget Binning
CDPH Environmental Review Unit

Cc: CDPH Lassen District Office
State Clearinghouse

Stan Wangberg

From: Hanagan, Kim (CDPH-DDWEM) [Kim.Hanagan@cdph.ca.gov]

Sent: Monday, September 12, 2011 1:36 PM

To: acidstan@sbcglobal.net

Subject: FW: clarification re: ACID project

Just fyi re: a letter from cdph to you dated 9/9 that stated you need a water supply permit, which you don't. (the groundwater well construction project)

Kim Hanagan, P.E.

Lassen District Associate Engineer
California Dept. of Public Health/Division of Drinking Water
415 Knollcrest Drive, #110, Redding, CA 96002
(530) 224-2413
(530) 224-4844 fax

From: Binning, Bridget (CDPH-DDEWM)

Sent: Monday, September 12, 2011 1:14 PM

To: Hanagan, Kim (CDPH-DDWEM)

Subject: RE: clarification re: ACID project

Ok, thanks for the clarification. It wasn't very clear to me in their CEQA document.

Bridget

From: Hanagan, Kim (CDPH-DDWEM)

Sent: Monday, September 12, 2011 12:03 PM

To: Binning, Bridget (CDPH-DDEWM)

Subject: clarification re: ACID project

Hello Bridget, re: your sept 9 letter to San Wangberg at Anderson-Cottonwood Irrigation District, my understanding is their project is to construct 2 groundwater wells which will discharge only to their ag canal. The water will not be used for drinking. They wouldn't need a water supply permit from CDPH. I haven't seen any documents re: the project other than your letter (and I was in a meeting in which Mr. Wangberg was summarizing the project).

Thank you.

Kim Hanagan, P.E.

Lassen District Associate Engineer
California Dept. of Public Health/Division of Drinking Water
415 Knollcrest Drive, #110, Redding, CA 96002
(530) 224-2413
(530) 224-4844 fax

From: Stan Wangberg [mailto:acidstan@sbcglobal.net]

Sent: Friday, August 19, 2011 8:58 AM

To: Bill Bishop; Bill Suppa; Brenda Haynes; Brian Person; Conrad Tona; David Coxey; Don Groundwater; Eric Wedemeyer; Gerry Cupp; Joe Patten; John Van den Bergh; Ken Mariette; Hanagan, Kim (CDPH-DDWEM); Larry Ball; Lauri (Outback); Mike Berlien; Mike Sybert; Pam Clacker; Richard Dinges; Rick Cascarina; Tom Chism; Tom Warnock; Willie Rodriguez

Cc: Sarah Isbell; Holly D

9/28/2011

State Water Resources Control Board

SEP 14 2011

Stan Wangberg
Anderson-Cottonwood Irrigation District
2810 Silver Street
Anderson, CA 96007

Dear Mr. Wangberg,

CLEAN WATER STATE REVOLVING FUND (CWSRF) PROGRAM INFORMATION FOR THE ANDERSON-COTTONWOOD IRRIGATION DISTRICT (DISTRICT); ANDERSON-COTTONWOOD IRRIGATION DISTRICT INTEGRATED REGIONAL WATER MANAGEMENT PROGRAM-GROUNDWATER PRODUCTION ELEMENT PROJECT (PROJECT)

We have received a copy of the District's draft Initial Study and Mitigated Negative (IS/MND) from the State Clearinghouse for the Project. Since the Project may be eligible for CWSRF financing, the State Water Resources Control Board (State Water Board) is providing some information on the environmental review requirements of the CWSRF Program should you decide to pursue CWSRF financing in the future.

2-1

The CWSRF Program provides low-cost financial assistance for a wide variety of water quality improvement and enhancement projects that protect water quality and public health. It has grant funds under certain conditions with limited availability. The application period is continuous. For additional information, please refer to the State Water Board's CWSRF Program website at: www.waterboards.ca.gov/water_issues/programs/grants_loans/srf/index.shtml.

Due to staffing constraints, we are unable to provide "specific" comments at this time if there are no clear indications that an agency will seek funding from the CWSRF Program. If you decide to pursue CWSRF financing, please note that in addition to CEQA requirements, there are federal environmental laws and regulations applicable to the CWSRF Program. Any environmental issues must be resolved before the State Water Board can approve CWSRF financing for your Project. Enclosed are three brochures that explain the CWSRF Program environmental review process, and an environmental evaluation form listing the applicable federal requirements. The District must meet those listed federal requirements if it decides to seek CWSRF financing.

BASIC CRITERIA FOR CULTURAL RESOURCES REPORTS

FOR SECTION 106 CONSULTATION WITH THE STATE HISTORIC PRESERVATION OFFICER (SHPO) UNDER THE NATIONAL HISTORIC PRESERVATION ACT (NHPA)

CURRENT RECORDS SEARCH INFORMATION

- A current (less than a year old) records search from the appropriate Information Center is necessary. The records search should include maps that show all recorded sites and surveys in relation to the area of potential effects (APE) for the project.
- The APE is three-dimensional and includes all areas that may be affected by the project. It includes the surface area and extends below ground to the depth of any project excavations.
- The records search request should be made for an area larger than the APE. The appropriate area varies for different projects but should be drawn large enough to provide information on what types of sites may exist in the vicinity.

NATIVE AMERICAN AND INTERESTED PARTY CONSULTATION

- Native American and interested party consultation should be initiated at the beginning of any cultural resource investigations. The purpose is to gather information from people with local knowledge that may be used to guide research.
- A project description and map should be sent to the Native American Heritage Commission (NAHC) requesting a check of their Sacred Lands Files. The Sacred Lands Files include religious and cultural places that are not recorded at the information centers.
- The NAHC will include a list of Native American groups and individuals with their response. A project description and maps should be sent to everyone on the list asking for information on the project area.
- Similar letters should be sent to local historical organizations.
- Follow-up contact should be made by phone if possible and a phone log should be included in the report.

REPORT TERMINOLOGY

- A cultural resources report used for Section 106 consultation should use terminology consistent with the NHPA.

INSTRUCTIONS AND GUIDANCE FOR "ENVIRONMENTAL COMPLIANCE INFORMATION"

Introduction:

Detailed information, including statutes and guidelines on the California Environmental Quality Act (CEQA), can be obtained at <http://ceres.ca.gov/ceqa>. A CEQA Process Flowchart that shows interaction points between lead and responsible agencies can be found at http://ceres.ca.gov/topic/env_law/ceqa/flowchart/index.html. In addition, State Water Board environmental staff is available to answer questions about the CEQA process. Please contact your assigned Project Manager to be directed to an appropriate environmental staff person for further clarification.

CEQA Checklist:

All projects coming to the State Water Board for funding are considered "projects" under CEQA because the State Water Board is providing discretionary approval for that funding.

The types of CEQA documents that might apply to an applicant's project include one of the following: 1. Notice of Exemption; 2. Initial Study/Negative Declaration (or Mitigated Negative Declaration with a Mitigation Monitoring and Reporting Program [MMRP]); or 3. Environmental Impact Report (EIR) with an MMRP. The applicant must determine the appropriate document for its project and submit the additional supporting information listed under the applicable section of the CEQA Checklist. Please submit two copies of all documents. If the applicant is using a CEQA document that is older than five years, the applicant must re-evaluate environmental and project conditions, and develop and submit an updated document based on the results of that re-evaluation.

The applicant must ensure the CEQA document is specific to the project for which funding is being requested. Tier I CEQA documents, such as Program or Master Plan EIRs, may not be suitable for satisfying State Water Board requirements if these documents are not project-specific. Instead, the applicant should be submitting a Tier II CEQA document that is project-specific. If this Tier II CEQA document references pertinent environmental and mitigation information contained in the Tier I CEQA document, then the applicant must submit both documents. *[NOTE: Tier I and Tier II documents refer to documents as defined under CEQA. Although the same terminology is used, these documents do not relate to the Tier I and Tier II level of reviews under the CWSRF Program.]*

Each applicant, if it is a public agency, is responsible for approving the CEQA documents it uses regardless of whether or not it is a lead agency under CEQA. Non-profit organizations, however, shall only be responsible for approving the applicable project mitigation measures identified in the MMRP. For purposes of State Water Board funding, all public agencies applying for this funding shall file either a Notice of Exemption or a Notice of Determination with the Governor's Office of Planning and Research (State Clearinghouse). Stamped copies of these notices shall be submitted with the rest of the environmental documents.

If the CEQA document is linked to a National Environmental Policy Act (NEPA) document (such as an Environmental Assessment or an Environmental Impact Statement), then the applicant shall submit the additional corresponding NEPA items with either a Finding of No Significant Impact, or a Record of Decision made by the lead agency under NEPA.

3. Clean Air Act:

For CWSRF financed projects, we recommend including a general conformity section in the CEQA documents so that another public review process will not be needed, should a conformity determination be required. The applicant should check with its air quality management district and review the State Air Resources Board California air emissions map for information on the State Implementation Plan. For information on the analysis steps involved in evaluating conformity, please contact the environmental staff person through the assigned Project Manager.

4. Coastal Zone Management Act:

For affected areas, refer to <http://coastalmanagement.noaa.gov/mystate/docs/StateCZBoundaries.pdf>. For additional information please refer to <http://www.coastal.ca.gov/ccatc.html> and/or <http://www.bcdc.ca.gov/>.

5. Farmland Protection Policy Act:

The Natural Resources Conservation Service provides information on the Farmland Protection Policy Act at <http://www.nrcs.usda.gov/programs/fppa>. Please see the following website regarding the Williamson Act <http://www.consrv.ca.gov/dlrp/lca>.

6. Floodplain Management - Executive Order 11988:

Each agency shall provide leadership and take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health and welfare, and to restore and preserve the natural and beneficial values served by floodplains in carrying out its responsibilities. Before taking an action, each agency shall determine whether the proposed action will occur in a floodplain. The generally established standard for risk is the flooding level that is expected to occur every 100 years. If an agency has determined to, or proposes to, conduct, support, or allow an action to be located in a floodplain. The agency shall consider alternatives to avoid adverse effects and incompatible development in the floodplains. For further information, please consult the following web link: <http://www.epa.gov/owow/wetlands/regs/eo11988.html>.

7. Migratory Bird Treaty Act (MBTA):

The MBTA, along with subsequent amendments to this Act, provides legal protection for almost all breeding bird species occurring in the United States and must be addressed in CEQA. The MBTA restricts the killing, taking, collecting and selling or purchasing of native bird species or their parts, nests, or eggs. The treaty allows hunting of certain game bird species, for specific periods, as determined by federal and state governments. In the CEQA document, each agency must make a finding that a project will comply with the MBTA. For further information, please consult the following web link: <http://www.fws.gov/laws/lawsdigest/migtrea.html>.

8. Protection of Wetlands – Executive Order 11990:

Projects, regardless of funding, must get approval for any temporary or permanent disturbance to federal and state waters, wetlands, and vernal pools. The permitting process is usually through the

CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)
CHECKLIST FOR THE APPLICANT
What to Submit to your State Water Board's Project Manager

If project is covered under a **CEQA Categorical or Statutory Exemption**, submit a copy of the following:

- ☐ **Notice of Exemption (filed with the Governor's Office of Planning and Research)**
- ☐ **List of Best Management Practices (BMPs) and their locations, if project implements BMPs**
- ☐ **Map of the project area**

If project is covered under a **Negative Declaration**, submit a copy of the following:

- ☐ **Draft and Final Initial Study/Negative Declaration**
(or Mitigated Negative Declaration, if applicable)
 - ☐ Comments and Responses to the Draft
 - ☐ Mitigation Monitoring and Reporting Program (if using a Mitigated Negative Declaration)
- ☐ **Resolution approving the CEQA documents**
 - ☐ Adopting the Negative Declaration
 - ☐ Making CEQA Findings
- ☐ **Notice of Determination (filed with the Governor's Office of Planning and Research)**

If project is covered under an **Environmental Impact Report (EIR)**, submit a copy of the following:

- ☐ **Draft and Final EIR**
 - ☐ Comments and Responses to the Draft
 - ☐ Mitigation Monitoring and Reporting Program (MMRP)
- ☐ **Resolution approving the CEQA documents**
 - ☐ Certifying the EIR and adopting the MMRP
 - ☐ Making CEQA Findings
 - ☐ Adopting a Statement of Overriding Considerations for any adverse impact(s) that cannot be avoided or fully mitigated if project is implemented
- ☐ **Notice of Determination (filed with the Governor's Office of Planning and Research)**

If EIR is a joint CEQA/National Environmental Policy Act document (EIR/Environmental Impact Statement or EIR/Environmental Assessment), submit the applicable Record of Decision and/or Finding of No Significant Impact.

3. **Clean Air Act: Is the project subject to a State Implementation Plan (SIP) conformity determination?**

☐ No. The project is in an attainment or unclassified area.

☐ Yes. The project is in a nonattainment area or attainment area subject to maintenance plans. Include information to indicate the nonattainment designation (e.g. moderate, serious or severe), if applicable. If estimated emissions (below) are above the federal de minimis levels, but the project is sized to meet only the needs of current population projections that are used in the approved SIP for air quality, then quantitatively indicate how the proposed capacity increase was calculated using population projections.

Air Basin Name: _____

Provide the estimated project construction and operational air emissions (in tons per year) in the chart below, and attach supporting calculations.

Attach any air quality studies that may have been done for the project.

Pollutant	Status (Attainment, Nonattainment or Unclassified)	Threshold of Significance for the Area (if applicable)	Construction Emissions (Tons/Year)	Operation Emissions (Tons/Year)
Carbon Monoxide (CO)				
Ozone (O ₃)				
Oxides of Nitrogen (NO _x)				
Particulate Matter (PM _{2.5})				
Particulate Matter (PM ₁₀)				
Reactive Organic Gases (ROG)				
Sulfur Dioxide (SO ₂)				
Volatile Organic Compounds (VOC)				

4. **Coastal Zone Management Act:**

Is any portion of the project site located within the coastal zone?

☐ No. The project is not within the coastal zone.

☐ Yes. Describe the project location with respect to coastal areas, and the status of the coastal zone permit:

8. **Protection of Wetlands:**

Does any portion of the project area contain areas that should be evaluated for wetland delineation or require a permit from the U.S. Army Corps of Engineers?

☐ No. Provide the basis for such a determination:

☐ Yes. Describe the impacts to wetlands, potential wetland areas, and other surface waters, and the avoidance, minimization, and mitigation measures to reduce such impacts. Provide the status of the permit and information on permit requirements:

9. **Wild and Scenic Rivers Act:**

Is any portion of the project located within a wild and scenic river?

☐ No. The project will not impact a wild and scenic river.

☐ Yes. Identify the wild and scenic river watershed and project location relative to the affected wild and scenic river:

Identify watershed where the project is located: _____

10. **Source Water Protection:**

Is the project located in an area designated by the U.S. Environmental Protection Agency, Region 9, as a Sole Source Aquifer?

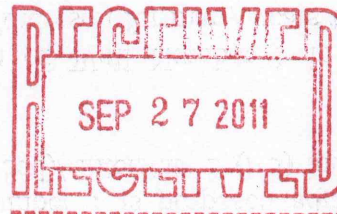
☐ No. The project is not within the boundaries of a sole source aquifer.

☐ Yes. Identify the aquifer (e.g., Santa Margarita Aquifer, Scott's Valley, the Fresno County Aquifer, the Campo/Cottonwood Creek Aquifer or the Ocotillo-Coyote Wells Aquifer):

DEPARTMENT OF TRANSPORTATION
OFFICE OF COMMUNITY PLANNING
1657 RIVERSIDE DRIVE
P. O. BOX 496073
REDDING, CA 96049-6073
PHONE (530) 229-0517
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September 26, 2011

Mr. Stan Wangberg
Anderson Cottonwood Irrigation District
2810 Silver Street
Anderson, CA 96007

IGR/CEQA Review
Sha-5-4.2
ACID Integrated Water Management Plan
Anderson Cottonwood Irrigation District
FONSI/Mitigated Negative Declaration
SCH# 2011082076

Dear Mr. Wangberg:

Thank you for the opportunity to review the Mitigated Negative Declaration and Finding of No Significant Impact (FONSI) determination prepared for the Anderson Cottonwood Irrigation District's (ACID) Groundwater Production Element of the Integrated Regional Water Management Program. The plan provides for the construction of two groundwater production wells that would augment the District's existing surface water supply. Well Number 1 is proposed adjacent to the northwest quadrant of the Factory Outlets Drive (Deschutes Road)/ Interstate 5 (I-5) interchange. The second well is off of Gas Point Road in the Cottonwood area.

Caltrans has concerns with the proposed location of Well Number 1 in proximity to the I-5 interchange. Caltrans has worked with the City of Anderson for many years to develop a two-phase interchange project for the long-term operation of the interchange. Phase 1 involves adding a northbound offramp and a roundabout on the east side of the interchange. Phase 2 would add a roundabout to the west side and would change the offramp alignment. This project raises concerns regarding the proposed well location in relation to the offramp re-alignment. Caltrans requests that the ACID work with Caltrans and the City of Anderson to determine a location that would minimize the impacts to the future interchange project.

3-1

We hope that the ACID will consider this concern in the adoption and implementation of the Plan's Groundwater Production Element to prevent future conflicts with the highway interchange improvement project. We are available to discuss the concerns expressed. If you have any questions, or if the scope of this project changes, please call me at 225-3369.

Sincerely,

A handwritten signature in blue ink, appearing to read "Marcelino".

MARCELINO GONZALEZ
Local Development Review
Office of Community Planning
District 2

c: City of Anderson

AQUALLIANCE

DEFENDING NORTHERN CALIFORNIA WATERS

September 28, 2011

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Shelly Hatleberg, Natural Resources
Specialist, Mid-Pacific Region
U.S. Bureau of Reclamation
2800 Cottage Way
Sacramento, CA 95825
Sent Via e-mail to shatleberg@usbr.gov

Stan Wangberg, District Manager
Anderson-Cottonwood Irrigation
District
2810 Silver St.
Anderson, CA 96007

Re: Draft Environmental Assessment/Initial Study and Finding of No Significant Impact/Mitigated Negative Declaration for the Anderson-Cottonwood Irrigation District Integrated Regional Water Management Program – Groundwater Production Element Project.

Dear Ms. Hatleberg and Mr. Wangberg:

AquAlliance submits the following comments and questions for the Environmental Assessment (EA), Initial Study/Mitigated Negative Declaration (IS/MND), and Findings of No Significant Impact (FONSI) for the Anderson-Cottonwood Irrigation District Integrated Regional Water Management Program – Groundwater Production Element Project (Project). The stated purpose for the Project is explained as follows:

Under the Sacramento Valley Integrated Regional Water Management Program (SVIRWMP) Grants Program, Reclamation provides financial assistance to support activities that promote the preparation and revision of written regional water management/conservation plans, implement activities identified in written water management plans, demonstrate new or previously unknown water management technologies and practices, and promote improved understanding of good water use practices and principles. Reclamation is providing financial assistance to the Anderson-Cottonwood Irrigation District (ACID or District) for SVIRWMP revision and implementation. The District's Groundwater Production Element Project (Proposed Project) includes the installation of two groundwater wells to supplement existing District surface water and groundwater supplies. The Proposed Project would improve the flexibility and reliability of the District's water supply, particularly during dry and critically dry water years. In 2004, ACID's surface water rights were reduced from 165,000 to 121,000 ac-ft per year as part of the renegotiation of the 40-year Settlement Contract. Furthermore, the west side of the District's system has little to no downstream control. The Proposed Project would help with the flexibility and reliability required to meet agricultural water needs in the District's service area.

FONSI p.2

I. General Comments

A. Please provide AquAlliance with an explanation of the “SVIRWMP revision” that is planned or required for the Project. FONSI at p.2, EA/ FONSI/IS/MND at p. 1-2. AquAlliance requests notification of changes made to the SVIRWMP. 4-1

B. The Bureau of Reclamation’s draft environmental review of the Project does not comply with the requirements of National Environmental Policy Act (“NEPA”), 42 U.S.C. §4321 *et seq.* The Bureau’s reliance on the EA alone violates NEPA requirements because, among other things, the EA fails to provide a reasoned analysis and explanation to support the Bureau’s proposed finding of no significant impact (FONSI). The EA alternatives analysis is fundamentally flawed and the treatment of the chain of cause and effect extending from project implementation leads to an inadequate analyses of nearly every resource, growth inducing impacts, and cumulative impacts. 4-2

C. Second, the EA/ FONSI/IS/MND does not benefit from programmatic NEPA and CEQA review for the SVIRWMP or the Sacramento Valley Water Management Agreement (SVWMA) (Plans). This leaves the Project and all other SVIRWMP and SVWMA projects without the ability to tier from the larger project plan’s environmental review. An EIS/EIR for the SVIRWMP and the SVWMA would afford the Bureau, DWR, the State Water Resources Control Board, and the California public clearer insight into how, where, and why the SVIRWMP and the individual component projects are needed. The Project’s draft EA/ FONSI/IS/MND as released this month fails to provide adequate disclosure of significant impacts from the Project and in conjunction with the numerous other projects that are part of the SVIRWMP and the SVWMA. 4-3

CEQA requires lead agencies in California to prepare a detailed environmental impact report when a project has the potential to have a “Significant effect on the environment [that] means a substantial, or potentially substantial, adverse change in the environment. . . .” (§ 21068; see *Dehne v. County of Santa Clara* (1981) 115 Cal.App.3d 827, 843-844 [171 Cal.Rptr. 753]) (Pub. Res. Code §§ 21100, 21151; 14 Cal. Code Regs., §§15064(a)(1), (f)(1).), DWR has failed to produce or require programmatic environmental review for the SVWMA or the SVIRWMP.

As demonstrated in these comments, a negative declaration is not the appropriate level of review required for the Project (*Laurel Heights Improvement Association v. Regents of the University of California*, 1988, 47 Cal.3d 376). The lead agencies have failed to take a hard look at the environmental impacts of the Project. The conclusion reached in the CEQA check list, “The proposed avoidance and minimization measures would reduce the overall impact on the proposed project to a level of less than significant,” fails on its face as substantial questions remain unanswered throughout the EA/ FONSI/IS/MND. For example, the Project’s proposed aquifer extractions may have significant effect on the region’s environmental and hydrological conditions yet there is no discussion or mitigation provided for review and the “monitoring and remedial action plans” are not provided. In addition, there are also substantial questions about whether the Project will have significant adverse environmental impacts when considered in conjunction with the other related water projects underway and proposed in the region. The Bureau and ACID simply cannot, consistent with NEPA and CEQA, allow these foreseeable environmental impacts to escape full analysis in an EIS/EIR of some kind, either programmatic or project specific. 4-4
4-5

The EA/ FONSI/IS/MND is a part of numerous plans, grants, and agreements. Installing new wells for production is part of the Sacramento Valley Water Management Agreement--Implementation of Short- 4-6

term Projects, which is a massive project with significant impacts. This alone illustrates that the Project is part of a larger project that has not been reviewed programmatically under NEPA and CEQA, but as stated above, ACID is party to it and the Project is funded through another plan that failed to conduct NEPA or CEQA review: the SVIRWMP.

4-6

D. The SVWMA and the SVIRWMP moved ACID and other Settlement Contractors forward into the lucrative water selling market. During the 2009 drought, ACID managed to sell water to Shasta Lake City, Bella Vista, Shasta Community Services District, and Kanawha Water District. The Plans goals require districts to incorporate ground water use into their operations, so that more water is available for junior water rights holders south of the Delta. Just how other northstate water dependent farms, businesses, residents and flora and fauna will be impacted has *never* been fully explored.

4-7

Purpose and Need

The draft EA/ FONSI/IS/MND suggests that the purpose and need for the project stems from the 2004, 40-year Settlement Contract that was renegotiated between the Bureau and ACID that lead to a loss of 44,000 acre-feet (AF) per year to the district. ACID's water delivery systems also present the district with challenges. If the intent is to provide "help with the flexibility and reliability required to meet agricultural water needs" as stated on page 1-2, there are numerous alternatives that have not been explored (see Alternatives below).

4-8

The undeclared part of the Project is disclosed in the SVIRWMP.

The ACID is continuing to develop a conjunctive water management and monitoring program to supplement current surface supplies and reduce Sacramento River diversions. Water produced as part of this project is proposed to be dedicated to meeting water quality standards in the Bay-Delta and improve local, regional, and statewide water supply reliability depending on year type in accordance with the SVWMA [Sacramento Valley Water Management Agreement]. Further detail on the SVWMA and the project are provided in Section 1, Introduction, and Section 4, Assessment of Water Management Strategies, of this IRWMP. pp 6-9 - 6-10.

From the behavior by the Bureau and DWR, with salinity standards routinely violated and the Delta and its tributaries' fish in dire straits, it is the "statewide water supply reliability" component that drives this and other SVWMA and SVIRWMP actions.

Also undisclosed in the draft EA/ FONSI/IS/MND is that during the 2009 drought, ACID managed to sell water as mentioned above. This does not appear to be a district that needs more water for its own operations, but rather to assist the Bureau, DWR, and other local agencies meet their wishes or demands.

4-9

Section 1.5 Potential Environmental Issues

Third Parties

The draft EA/ FONSI/IS/MND fails to mention the emphasis found in state and federal law protecting third parties from injury that emanates from water transfers. While the lead agencies may not recognize the connection between the Project and water transfers, to AquAlliance the association is clear. ACID entered the water marketing business through its adoption of both the SVWMA and the SVIRWMP and its activities. As noted above, in 2009 alone, ACID entered into agreements to transfer water to Shasta Lake City, Bella Vista, Shasta Community Services District, and the Kanawha Water District. The draft EA/ FONSI/IS/MND fails to disclose how the lead agencies will protect third parties, including the environment, from new ground water pumping and transfers.

4-10

California Water Code Section 1810 and the CVPIA protect against injury to third parties as a result of water transfers. Three fundamental principles include (1) no injury to other legal users of water; (2) no unreasonable effects on fish, wildlife or other in-stream beneficial uses of water; and (3) no unreasonable effects on the overall economy or the environment in the counties from which the water is transferred.

Liability is a crucial component of potential third party impacts. The draft EA/ FONSI/IS/MND does not reveal any information about the current status of the ground water basin, which indicates that there is not enough known about the aquifer to judge liability for damage from pumping. How will the lead agencies rectify this for other ground water dependent users and the environment?

4-11

Section 2 No Action Alternative and Proposed Action

Alternatives

The No Action Alternative is the only alternative named in the documents. AquAlliance finds this alternative poorly defined and the absence of any other alternatives troubling for many reasons.

- The No Action Alternative fails to explain what are the implications of this alternative beyond the potential of a 25 percent cutback in base (121,000 AF) and project water (4,000 AF) supply in critically dry years. p. 2-1 More information must be provided, such as how often has ACID had such cutbacks in the last 30 years? How large were the actual water shortages? How did ACID handle this in the past and what were the implications for ACID members?
- The No Action Alternative acknowledges that the surrounding land use will become more urban and that ground water will be an important water source for the future residents. p. 2-1. There isn't any discussion in this section of the significance of ACID becoming a new ground water user in the region or how it will affect the present and future users in the region. The analysis provided in Section 3 is minimal at best and basically concludes that there are no impacts from the Project except during construction. This significantly stretches the lead agencies' credibility.
- The absence of any other alternatives makes the EA/FONSI/IS/MND completely inadequate. On page 1-1, the Purpose and Need section highlights the potential for many other management and supply options by explaining that, "... the west side of the District's system has little to no downstream control. Control of the system is achieved at the head of the 35-mile main canal, causing some delivery difficulties at the downstream end of the service area. By pushing water from upstream to downstream without an ability to manage intermediate water surface elevations, downstream response time to water delivery needs can be greatly hindered." The Background section also points out that, "When flow exceeds the canal capacity, ACID water overflows into several wasteways along the canal route." draft EA/FONSI/IS/MND at p.1-1. To "improve the flexibility and reliability of the District's water supply" ACID could make system improvements, pursue conservation, and establish regional transfers between CVP contractors and other regional water purveyors without incorporating ground water into their operations. These are viable alternatives that are discussed in the SVIRWMP (pp. 6-10), but have been ignored here.
- One remaining alternative is to renegotiate the contract that ACID has with the Bureau.

4-12

4-13

4-14

4-15

NEPA's implementing regulations call for analysis of alternatives is "the heart of the environmental impact statement," 40 C.F.R. §1502.14, and they require an analysis of alternatives within an EA. *Id.* §1408.9. The statute itself specifically requires federal agencies to:

study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning available uses of resources.

42 U.S.C. §4332(2)(E). The case law makes clear that an adequate analysis of alternatives is an essential element of an EA, and is designed to allow the decision maker and the public to compare the environmental consequences of the proposed action with the environmental effects of other options for accomplishing the agency's purpose. The Ninth Circuit has explained that "[i]nformed and meaningful consideration of alternatives ... is ... an integral part of the statutory scheme." *Bob Marshall Alliance v. Hodel*, 852 F.2d 1223, 1228 (9th Cir. 1988) (holding that EA was flawed where it failed adequately to consider alternatives). An EA must consider a reasonable range of alternatives, and courts have not hesitated to overturn EAs that omit consideration of a reasonable and feasible alternative. *See People ex rel. Van de Kamp v. Marsh*, 687 F.Supp. 495, 499 (N.D. Cal. 1988); *Sierra Club v. Watkins*, 808 F.Supp. 852, 870-75 (D.D.C. 1991).

There are only two alternatives presented here: the No Action and the Proposed Action. The lack of any alternative action proposal is unreasonable and is by itself a violation of NEPA's requirement to consider a reasonable range of alternatives.

4-16

Well-Siting Criteria

Page 2-7 states that the wells capacities will be 3,500 gallons per minute. At the 24 hour pumping rate that is expected, that equates to 15.46 acre-feet per day and 2,365 acre-feet for one well from the June to October period (noncritical scenario) of expected operation. In the critical scenario with both wells pumping from April to October, the expected output would be 6,617 acre-feet. As a new extractor of ground water, what are ACID's "monitoring and remedial action plans," that are mentioned on page 2-7? How is the public to know if the plans are adequate or not when no detail is provided?

4-17

Section 3 National Environmental Policy Act – Affected Environment and Environmental Consequences

- Page 3-5 Subsidence. "Land subsidence has never been monitored in the RGB, but is expected to be small, given the lack of chronically depressed groundwater levels and because the current magnitude of groundwater pumping in the basin represents a very small fraction of the amount of water available for groundwater recharge." If subsidence has not been monitored in the Redding Ground Water Basin, the assertions contained in the quotation above are without merit and the NEPA and CEQA analysis inadequate.
- Page 3-5 to 3-6 Assessment Methods. "Therefore, the approach for forecasting groundwater-level impacts of the proposed action includes evaluating the incremental drawdown at distances of 0.25 mile and greater from a proposed project well." AquAlliance questions the selection of only .025. In production well tests conducted in Glenn County in 2007 indicated that the recharge source for the solitary production well "is most likely from the foothills and mountains, to the east and north"—which at a minimum is more than fifteen miles away. (DWR, Glenn-Colusa Irrigation District Aquifer Performance Testing Glenn County, California).

4-18

4-19

Cumulative Impacts

The EA/ FONSI/IS/MND acknowledges that the Project is part of a much larger project on page 1-1. "Northern California Water Association (NCWA) is the grantee. The grant provides \$9.5 million of funding to support the implementation of 11 projects throughout the Sacramento Valley. Federal funding is also being provided to seven districts to support their implementation of the Sacramento Valley Integrated Regional Water Management Plan (IRWMP)."

Added to ACID's participation in the SVIRWMP are the numerous current and reasonably foreseeable water programs that include the Project and/or are related to the SVIRWMP including:

- Sacramento Valley Water Management Agreement (October 2001)
- Regional Integration of the Lower Tuscan Groundwater Formation into the Sacramento Valley Surface Water System Through Conjunctive Water Management (June 2005)
- Sacramento Valley Regional Water Management Plan (January 2006)
- Stony Creek Fan Aquifer Performance Testing Plan for 2008-09
- Draft Initial Study for 2008-2009 Glenn-Colusa Irrigation District Landowner Groundwater Well Program
- Lower Tuscan Integrated Planning Program, a program funded by the Bureau that will "integrate the Lower Tuscan formation aquifer system into the management of regional water supplies."
- Annual forbearance agreements by SWP and CVP contractors
- Drought Water Bank 2009
- 2010-2011 Water Transfer Program
- 10-Year, 600,000 Acre-Feet per Year, Water Transfer Program (Bureau and San Luis Delta Mendota Water Authority)

The draft EA/ FONSI/IS/MND does not, as we have mentioned repeatedly, reveal that the current Project is part of the much larger set of Plans to develop ground water in the region, to develop a "conjunctive" system for the region, and to integrate northern California's ground water into the state's water supply. These are plans that the Bureau, DWR, and others have pursued and developed for many years. Indeed, one of the plans — the short-term phase of the SVWMA — is still the subject of an ongoing scoping process for a Programmatic EIS/EIR dating back to 2003.

4-20

In assessing the significance of a project's impact, the Bureau must consider "[c]umulative actions, which when viewed with other proposed actions have cumulatively significant impacts and should therefore be discussed in the same impact statement." 40 C.F.R. §1508.25(a)(2). A "cumulative impact" includes "the impact on the environment which results from the incremental impact of the action when added to *other past, present and reasonably foreseeable future actions* regardless of what agency (Federal or non-Federal) or person undertakes such other actions." *Id.* §1508.7. The regulations warn that "[s]ignificance cannot be avoided by terming an action temporary or by breaking it down into small component parts." *Id.* §1508.27(b)(7). However, because the lead agencies chose to look at only one component project here, they find that there are no cumulative impacts to water, land, agriculture, biological resources and sensitive species after construction, American Indian Trust Assets, Environmental Justice, Greenhouse Gas, pp. 3-13, 3-19, 3-26, 3-30, 3-32, 3-41.

An environmental impact statement should also consider "[c]onnected actions." *Id.* §1508.25(a)(1). Actions are connected where they "[a]re interdependent parts of a larger action and depend on the larger action for their justification." *Id.* §1508.25(a)(1)(iii). Further, an environmental impact statement should consider "[s]imilar actions, which when viewed together with other *reasonably foreseeable or proposed agency actions*, have similarities that provide a basis for evaluating their environmental consequences together, such as common timing or geography." *Id.* §1508.25(a)(3) (emphasis added).

As presented above, instead of assessing the cumulative impacts of the proposed action as part of the larger program (SVWMA) that even the Bureau recognized should be subject to a programmatic EIS (but for which no programmatic EIS has been completed), the Bureau has attempted to separate the Project and approve it through an inadequate EA. Further, the Bureau has failed to take into account the cumulative effects of other ground water and surface water projects in the region, the development

of “conjunctive” water systems, and the anticipated further integration of Sacramento Valley surface and ground water into the state water system.

4-21

The Ninth Circuit Court makes clear that NEPA mandates “a useful analysis of the cumulative impacts of past, present and future projects.” *Muckleshoot Indian Tribe v. U.S. Forest Service*, 177 F.3d 800, 810 (9th Cir. 1999). Indeed, “[d]etail is required in describing the cumulative effects of a proposed action with other proposed actions.” *Id.* The very cursory cumulative effects discussion contained in the EA plainly fails to meet this standard.

Recommendations

The Project should be denied. If ACID needs more water for its members, there are other alternatives other than ground water that have not been explored at all according to the information provided in the EA/ FONSI/IS/MND.

If the Project is approved, it should meet the following conditions:

- ACID should be prohibited from transferring water. It is one thing for a Settlement Contractor to sell its surface water, as it did in 2009 (a drought year), to help its neighbors. It is quite another to tap into an aquifer and begin using a common resource for private gain and undisclosed growth inducing and cumulative impacts.
- The monitoring and remedial action plans must be based on the hydrology of the region, not ACID’s boundaries or simply modeling and include:
 - Ground water levels in at least a seven-mile radius to start, with adaptive adjustments possible in five year increments.
 - Water quality data
 - Environmental conditions including:
 - Baseline conditions for a minimum of five years before the wells may be used documenting seasonal tributary flows, subsidence, extant flora and fauna, and conditions for reproductive success and maturity.
 - If the Project is implemented, the monitoring must continue for seasonal tributary flows, subsidence, extant flora and fauna, and conditions for reproductive success and maturity.
- The monitoring and remedial action plans results must be readily available on the ACID web site with real time monitoring posted daily during months of pumping.

4-22

4-23

Please add AquAlliance to your NEPA and CEQA notification lists for all future ACID projects. Thank you.

Sincerely,




Barbara Vlamis, Executive Director



Memorandum

TO: Jeff Kiser

DATE: September 30, 2011

FROM: Bruce Crom 

JOB NO.: 26.98

SUBJECT: Draft environmental Assessment/Initial Study for ACID Integrated Regional Water Management Program-Groundwater Production Element Project – PACE Comments for the City of Anderson

Jeff:

This Memo is in regard to PACE Engineering's review of the Draft Environmental Assessment/Initial Study for ACID Integrated Regional Water Management Program-Groundwater Production Element Project (IRWMP Report) prepared by CH2MHill.

As you know from the report, there are two ACID wells proposed: Well No. 1 would be located within the City limits north of Deschutes Road near the Outlet Stores. Well No. 2 would be in the northern Cottonwood area. The wells would be drilled to a depth of approximately 500 feet and would contain 100 to 150 horsepower pumps that would have a capacity of roughly 3,500 gallons per minute (GPM) each. ACID intends to operate Well No. 1 only when Bureau of Reclamation (BoR) declares a critical dry year and ACID's water allocation is reduced by 25 percent. Well No. 2 will be used for critical dry years and also to supplement the ACID canal during the late summer months when vegetation fouling of the canals occurs in the southern end of the District. The report indicates that when the BoR declares a critical dry year, ACID would operate these two wells 24 hours a day (from April 1 to sometime in October) possibly drawing as much as 5 million gallons (15.5 Ac-Ft) a day from each well. Historically, since 1990, the BoR has reduced their agricultural water allotment approximately seven times. The worst cut backs occurred from 1990 to 1994 when BoR cut their agricultural allotments four of those 5 years.

After reviewing this document, we have the following comments as it relates to possible impacts to the City for the proposed Anderson Cottonwood Irrigation District (ACID) 3,500 GPM wells:

1. Currently, the ACID irrigation canal system is made up of about 35 miles of main line canals and an undetermined amount of lateral service canals that feed individual agriculture water users from Redding to Cottonwood. The report indicates that

98 percent of the canals within the ACID system are earth lined. The report suggests that (see Page D-10) of the 125,000 Ac-Ft/year that is allocated to ACID, approximately 44,000 Ac-Ft is lost through the ACID canal system due to seepage. This is approximately 35 percent of the water that is allocated by BoR to ACID each year.

Given the apparent poor efficiency (less than 65 percent) of the current ACID canal system to deliver water to its customers, we would recommend that the IRWMP report compare the overall socioeconomic impact of the proposed well project versus having ACID repair the existing canal system. For example, comparing the long-term electrical well pumping costs that would be wasted for using the proposed wells versus the costs of repairing the leaking canal system.

5-1

2. The use of NSF (National Sanitation Foundation) and State Health Department approved drilling fluids would be required when drilling the proposed wells in order to avoid contaminating groundwater in close proximity to existing municipal wells. See Page B-2.

5-2

3. Due to the close proximity of the proposed ACID Well No. 1 with other City municipal wells, the construction of the ACID Well should be per the Shasta County Health Department well construction standards for a potable water well (see Page B-2). The well should be chlorinated and tested in order to assure that no contaminants have entered the aquifer.

5-3

4. Based on the Report's Well Drawdown Analysis (Page 3-8) and finite element (REDFEM) analysis (Appendix D), it is estimated that the regional aquifer drawdown at the proposed ACID Well No. 1 site will be approximately 10 to 15 feet at the desired pumping rate of 3,500 GPM. The analysis also suggests that at 0.25 miles from the well, water table drawdown would be approximately 4.6 feet and at 0.5 miles the long term drawdown is estimated at approximately 3-feet. Currently, the City operates municipal Well No. 10 (i.e., Highway 273 Well) that is approximately 0.44 miles from the proposed ACID well site and Well No. 7 (Volonte Park Well) which is approximately 0.61 miles from the site.

The IRWMP report estimates that during the proposed ACID Well No. 1 operation, the expected long-term drawdown that would be seen at the City's Highway 273 facility would increase by about 3.2 feet and at the Volonte Well facility it is estimated that an additional 2 feet of drawdown can be expected. These increases in water table drawdown would ultimately increase pumping costs to the City (see IRWMP Page 3-38). The IRWMP estimates that for every 1-foot of drawdown added to an existing well pump the increase in electrical costs would be roughly \$0.38/ Ac-Ft /ft.

5-4

Currently, April to October pumping volumes for the Highway 273 well are estimated at 271 Ac-Ft and the Volonte Well volume is 330 Ac-Ft. Using the IRWMP cost estimate the

estimated added electrical costs that the City would be required to pay would be approximately \$330/year for City Well No. 10 and \$251/year for Well No. 7.

By comparison, a well drawdown pumping test performed by Lawrence and Associates in August 2005 for a high capacity potable water well (see attached Lawrence & Associates Test/Construction Well Installation and Testing, Vineyards of Anderson, Shasta County, California Figure 4) indicated that this well had a transmissivity (T) of 9.77×10^4 GPD/ft and a storage coefficient (S) of 1.0×10^{-4} . The test well is located approximately 1 mile from the proposed ACID Well No. 1 site. Using these test variables, we used the Cooper-Jacob Method to estimate drawdown at the Highway 273 Well (0.44 miles from the ACID Well No.1 site) during the pumping conditions of the proposed ACID Well No. 1 (3,500 GPM) for 200 consecutive days. Based on this analysis, we estimated that the drawdown at City Well No. 10 would be approximately 38 feet.

Obviously, if this increased drawdown condition were to occur, due to the proposed ACID well, the impact on the City wells would be much more significant than the IRWMP report estimates. For example, if an additional 38 feet were added to the current drawdown at City Well No. 10, the added electrical costs to operate this well, concurrently with the ACID well, would increase by about \$4,000 per year during critical dry years. In addition, if this drawdown condition did occur, other wells within the Anderson well system would also be affected including the Volonte Well (0.61 miles from the ACID well site), Balls Ferry Well (1.0 miles from the site) and possibly the Diamond St. Well and the North Street Well.

5-4

Obviously, these added pumping electrical costs, resulting from the operation of the proposed ACID well, will have to be verified. We recommend that the City review its current annual electrical pumping costs in order to define electrical usage per foot of drawdown at each well so that the City can evaluate specific financial impacts that may occur if the proposed ACID well is constructed. If it is determined that by constructing and operating ACID Well No. 1 at the proposed site significantly increases electrical pumping costs to the City, ACID should be required to reimburse the City for these added costs.

Given this apparent variability of ground water hydrology, we would recommend that, as a part of the proposed project, ACID perform well pilot studies using small diameter pumping and monitoring wells at each well site to verify estimated hydraulic pumping conditions (i.e., drawdown rates, storage capacity, transmissivity, etc) prior to constructing the large and more expensive production wells. The results of these pilot studies should be made available to the City for their review in order to analyze what impact the proposed ACID wells would have on the City's local well system.

5-5

5. If the project is implemented, ACID should consider notifying the City of Anderson when it is determined that DoR is declaring a critical dry year and that ACID will be operating their well facilities. Scheduling of the ACID well operations should be provided to the City in order for the City to monitor possible impacts on the City wells during ACID operations.

5-6

6. All monitoring well data that was used in preparation of the IRWMP report should be made available to the City of Anderson for review and comparison. It is recommended that if the ACID well project is constructed, all ACID monitoring wells used for the IRWMP report continue to be monitored by ACID staff (especially those monitoring wells located within the City's sphere of influence) and that this well data be available to the City of Anderson for review to determine possible groundwater and City well impacts.

5-7

I hope that these comments are useful. Please feel free to pass these comments on to ACID in response to the IRWMP report.



005002.00
Task 6

August 28, 2005

Mr. Sandy Sanderson
Sanderson Company, Inc.
975 SW Colorado Avenue, Suite 105
Bend, OR 97702

Dear Mr. Sanderson:

**SUBJECT: TEST/CONSTRUCTION WELL INSTALLATION AND TESTING, VINEYARDS OF
ANDERSON, SHASTA COUNTY, CALIFORNIA**

INTRODUCTION

This letter report presents completion information and water-quality data from the Test Well installed for the Vineyards of Anderson project. The Test Well was drilled to provide water for construction activities and to obtain site-specific data regarding water quality and quantity to optimize the design of a production well to be installed in the future in the same general vicinity. Additionally, this well will serve as an observation well during aquifer testing of the production well for the groundwater-impacts analysis that may be necessary to comply with the California Environmental Quality Act (CEQA).

The Test Well is located approximately 1 mile south of Anderson and 1 mile west of Highway I-5, in Township 30 North, Range 4 West, MDB&M (**Figure 1**). The general test-well location was chosen by PACE Civil, Inc., engineers for the City of Anderson.

SUMMARY

The Test Well was drilled to 500 feet below ground surface (bgs), and also was cased to that depth. There are two screened intervals extending from 280 to 400 and 440 to 480 feet bgs. After casing and testing, an electric submersible pump was installed to provide construction water.

Stratigraphy in this location is somewhat similar to that of the City of Anderson's Highway 273 well (City Well), with groundwater production from approximately the same zones. The Vineyards Test Well, however, has a higher proportion of sand/gravel/cobble units (from which

the major groundwater production occurs), suggesting that a production well near the Test Well would yield as much, or more, water than the City's well.

Using data from a short-term aquifer test on the Test Well, a long-term yield of about 1,500 gallons per minute (gpm) could be expected from a production well in this location.

DRILLING & WELL INSTALLATION

A well permit from Shasta County was obtained for the drilling. No other permits, such as a low-threat discharge permit from the Regional Water Quality Control Board, were required, because discharge from development and pumping did not go offsite.

The well was drilled and installed by Western Strata Exploration, Inc. (C-57 Lic. 552198), of Clarksburg, California, using the mud-rotary drilling method, during March and April 2005. First, a six-inch diameter pilot hole was drilled to 500 feet bgs and a geophysical log (resistivity and standard potential) was performed by Dewey Data (**Figure 2**). The geophysical log permits accurate determination of the depths and thicknesses of the various geologic strata, allowing accurate placement of screened intervals for optimum production. Drill cuttings were logged visually under the direct supervision of a California Professional Geologist from Lawrence & Associates.

After electric logging, the hole was reamed to 12 inches in diameter. Six-inch diameter, mild-steel casing was installed in the hole. The perforated intervals were from 280 to 400 and 440 to 480 feet bgs; the slotted casing was factory perforated, with vertical slots. **Figure 2** shows the construction details.

After the casing was installed, pea gravel was tremied into the hole around the perforated interval and up to 50 feet bgs. A neat-cement sanitary surface seal was placed above the gravel pack, to ground surface.

To remove drilling fluids from the annular space and formation around the screened intervals, the well was developed by air-lifting for approximately four hours and then pumping (with a temporary pump supplied by the drilling contractor) for approximately eight hours. This development was conducted by placing the drill pipe (for the air-lift development) or the pump at the bottom of the casing and moving it up and down freely.

After well completion and aquifer testing (described below), an electric submersible pump and appurtenances were installed in the well by J&J Pumps, Redding, California. The discharge pipe was plumbed into a tank for filling water trucks for construction; the tank was supplied by N&T Digmire of Redding, California. The pump and motor assembly is a Goulds model 5TLC020, 20 horsepower, 460 volt. J&J Pumps also installed a 460 volt, 3 phase pumping-plant panel.

STRATIGRAPHY & GROUNDWATER OCCURRENCE

The drill cuttings and geophysical log show a sequence of sand and gravel units interbedded with silt and clay units, typical of the geologic units observed in the Redding groundwater basin. The

sand and gravel units show a range of grain sizes, from fine sand to cobbles. Although cobble-sized clasts could not be distinguished in the drill cuttings because the drill-bit fractured them, the driller reported slow drilling because of cobbles in the intervals 260 to 395 and 445 to 490.

Based on the geophysical log, the sand/gravel/cobble units are dry to about 275 feet bgs. Below that level, coarse-grained units predominate to about 400 feet bgs. There is then a clayey interval from about 400 to 445 feet bgs; below that is another coarse-grained unit. These coarse-grained (cobble) intervals represent the water-bearing zone at this location.

The stratigraphy in the Vineyards of Anderson test well is somewhat similar to that in the City Well, based on the geophysical logs for both wells. To compare the logs, they were first set at their respective elevations (the Vineyards' test well is at about 650 feet MSL, while the City Well is at about 500 feet MSL), and then the logs were compared. Both locations have sand and gravel units at about the same elevations, but the Vineyards log shows a much higher proportion of sand and gravel, suggesting that groundwater yield in this location will be similar to, or higher than, that of the City Well. In both locations, the best groundwater production appears to be at an elevation of about 300 feet MSL or lower.

AQUIFER TESTING & WELL PRODUCTION

After the well was developed, aquifer testing was conducted for four hours. The well was tested at discharges from 90 to 115 gpm. Drawdown was measured with an electric well sounder while the well was pumped. Less than five feet of drawdown was observed. **Figure 3** shows drawdown vs. time and calculation of aquifer transmissivity (the ability of the aquifer to transmit water).¹ Transmissivity was calculated using a simplified, analytical solution to the Theis equation, a standard method to easily calculate transmissivity.

The calculated transmissivity is approximately 97,730 gallons per day per foot of aquifer thickness; this is similar to values calculated in other areas of the Redding basin. Using an aquifer thickness of 180 feet, the calculated hydraulic conductivity (transmissivity ÷ aquifer thickness) is 543 gallons per day per square foot or 73 feet per day, a relatively high value.

Figure 4 shows a calculation, using this data, to predict potential well yield of a larger well. This calculation first uses the Theis equation to replicate the results of the aquifer testing on the Test Well. In this first calculation, the previously calculated transmissivity, and the known pumping rate and drawdown are input, and the value of the aquifer storage coefficient² is adjusted until the calculated drawdown matches the observed drawdown (column labeled *Test Data* on **Figure 4**). The interpreted storage coefficient is 0.0001, a typical value for aquifers in the Redding basin.

¹ Transmissivity is the amount of water that can be transmitted horizontally through a unit width of aquifer by the full thickness of the aquifer under a groundwater gradient of 1.

² The storage coefficient represents the volume of water that a permeable unit will absorb or expel from storage per unit surface area per unit head; it is dimensionless.

To estimate a projected pumping rate, the available drawdown must first be established. Then, a pumping rate is chosen such that the calculated drawdown will not exceed the available drawdown. In this location, an available drawdown of 60 feet was chosen, based on the assumption that a production well would be screened below about 320 - 300 feet MSL, with a static water level of about 375 feet MSL (it is not good engineering practice to draw the pumping level below the top of the well screen). With those criteria, a long-term pumping rate of about 1,500 gpm should be possible. The long-term pumping rate reflects a period of 180 days, during the summer (a period of no recharge).

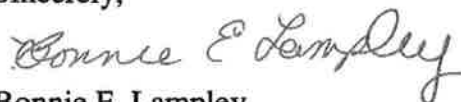
WATER-QUALITY SAMPLING

At the completion of the test pumping, water was collected from the discharge piping. Samples were stored on ice in coolers and hand-delivered under chain-of-custody to Basic Laboratory, Redding, California, a certified California laboratory. **Table 1** (following text) shows a summary of the results; **Appendix A** contains the laboratory sheets.

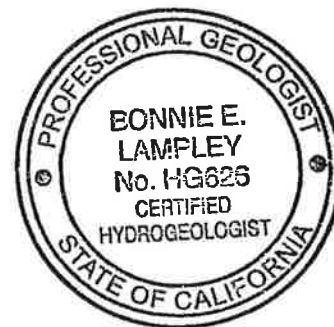
Water quality is excellent for all parameters except iron, which slightly exceeded its Maximum Contaminant Level (MCL) of 300 $\mu\text{g/L}$ (the concentration was 394 $\mu\text{g/L}$). Groundwater in the Redding basin often contains elevated iron concentrations. Turbidity also exceeded its MCL of 5 NTU (the value was 12.6 NTU). The elevated turbidity is likely a residual effect of drilling; the well could be tested again for turbidity at the end of this construction season, after significant pumping has occurred; at that time the discharge should be less turbid. Bacteriological samples should be collected at that time, also.

Please feel free to contact me at (530) 244-9703 or blampley@lwrnc.com if you have any questions regarding this report.

Sincerely,



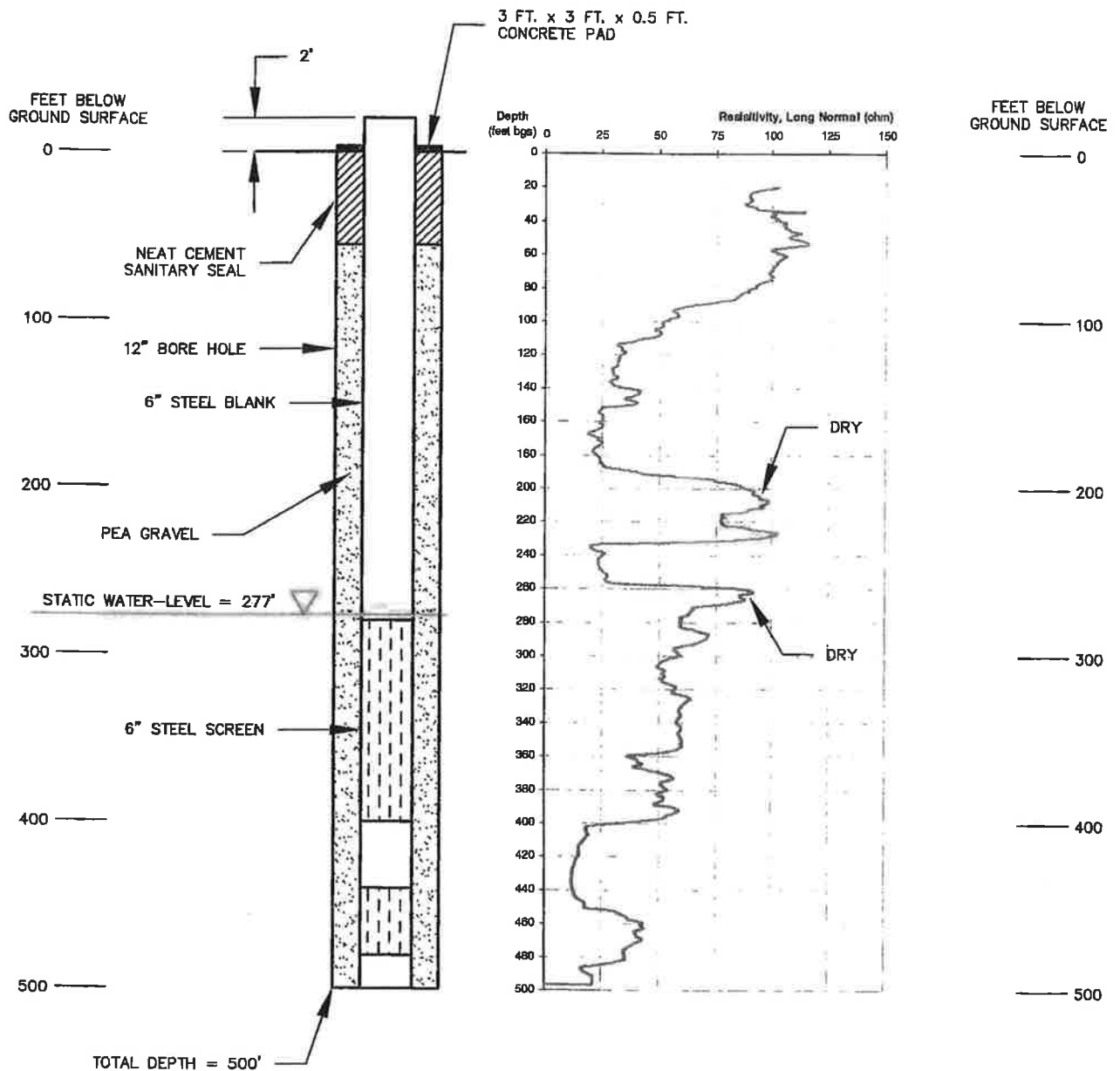
Bonnie E. Lampley
Senior Hydrogeologist, CHG 626



Cc: Mr. Bruce Crom, PACE Civil, Inc.
Mr. Frank Sawyer, SDS Engineering, Inc.

Enc. Table 1. Summary of analytical results
Figure 1. Location map
Figure 2. Well construction details and geophysical log
Figure 3. Drawdown vs. Time graph
Figure 4. Estimated drawdown and long-term pumping rate
Appendix. Laboratory sheets

TABLE 1 VINEYARDS OF ANDERSON TEST WELL WATER-QUALITY SAMPLED APRIL 16, 2005			
Analyte	Units	Result	MCL
Alkalinity	mg/L	93	NE
Bicarbonate	mg/L	113	NE
Carbonate	mg/L	<5	NE
Calcium	mg/L	13	NE
Chloride	mg/L	2.96	250-500-600
Color	units	10	15
Electrical conductance	umhos/cm	200	900-1600-2200
Fluoride	ug/L	0.08	1.4-2.4
Hardness	mg/L	60	NE
Magnesium	mg/L	8	NE
MBAS	mg/L	<0.02	0.5
Nitrate As N	mg/L	0.39	10
Nitrite As N	mg/L	0.01	1
Odor	T.O.N.	<2	3
pH	pH units	7.02	6.5-8.5
Potassium	mg/L	0.7	NE
Sodium	mg/L	14	NE
Sulfate	mg/L	4.97	250-500-600
Total dissolved solids	mg/L	136	500-1000-1500
Turbidity	NTU	12.6	5
Aluminum	ug/L	631	1000
Antimony	ug/L	<7.5	6
Arsenic	ug/L	<2	10*
Barium	ug/L	<125	1000
Beryllium	ug/L	<1	4
Cadmium	ug/L	<1	5
Chromium	ug/L	1	50
Copper	ug/L	<50	1300
Iron	ug/L	394	300
Lead	ug/L	<5.0	15
Manganese	mg/L	<25	50
Mercury	ug/L	<0.2	2
Nickel	ug/L	<1	100
Selenium	ug/L	<5.0	50
Silver	ug/L	<10	100
Thallium	ug/L	<1.0	2
Zinc	ug/L	139	5000
Notes: MCL = maximum contaminant level.			
NE = Not established.			
Bold-face type = exceeds MCL.			
*10 ug/L MCL for arsenic takes effect 2006; current MCL = 50 ug/L.			



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CONSTRUCTION WELL #1 VINEYARDS OF ANDERSON

LAWRENCE & ASSOCIATES
2001 MARKET STREET, RM. 523
REDDING, CA 96001
PHONE (530) 244-9703
FAX (530) 244-5021

SCALE:
1" = 100' VERTICAL
DATE: 8/29/2005
JOB NO: 005002.00

CLIENT:
SANDERSON COMPANY, INC.

PROJECT:
TEST WELL

DRAWN BY:
D. ZAITZ

FIGURE 2

Drawdown vs. Time Vineyards of Anderson Test Well

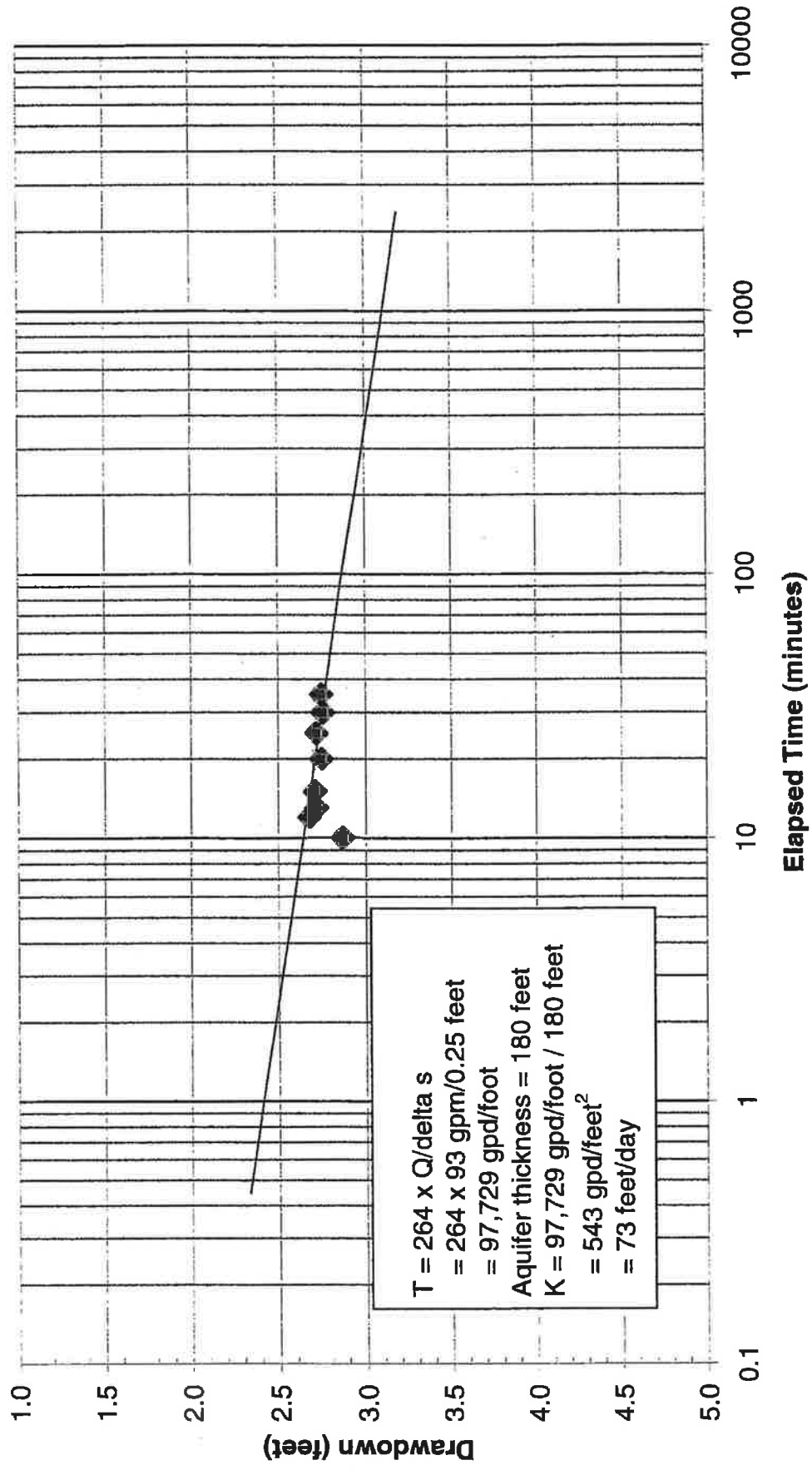


FIGURE 3

Estimated Drawdown & Long-Term Pumping Rate Vineyards of Anderson

Parameter	Units	Test Data	Projection
Distance from center of well	r, ft	0.4	0.4
Storage coefficient	S, d/less	1.00E-04	1.00E-04
Transmissivity	T, gpd/ft	9.77E+04	9.77E+04
Pumping time	t, minutes	35	259200
	t, days	0.02	180
Discharge	Q, gpm	92	1500
$u = [1.87r^2S/Tt]$	u	1.26E-08	1.70E-12
Well function of u	W(u)	17.61	26.52
Drawdown, theoretical = $[s1=114.6QW(u)/T]$	s1, ft	1.9	46.7
Specific Capacity = $[Q/s1=T/114.6W(u)]$	Q/s1, gpm/ft	48.4	32.153
Well efficiency	eff., percent	0.7	0.8
Calculated drawdown	s2, ft	2.71	58
Observed drawdown	s2, ft	2.75	n/a
Aquifer thickness	feet	180	n/a
Hydraulic conductivity	K, gpd/ft ²	543	n/a
Hydraulic conductivity	K, ft/day	73	n/a
Available drawdown	feet	n/a	60
Acceptable pumping rate? (2/3 of available drawdown)			YES

FIGURE 4