Appendix B Air Quality Technical Information

Appendix B Air Quality Technical Information

The purpose of this technical appendix is to describe the modeling techniques used to estimate criteria pollutant and greenhouse gas (GHG) emissions associated with construction and operation of the Proposed Action.

B.1 Project Construction

B.1.1 Criteria Air Pollutants

Construction of the Proposed Action would generate short-term emissions of reactive organic gases (ROG), oxides of nitrogen (NO_X), carbon monoxide (CO), particulate matter 10 microns in diameter or less (PM10), and particulate matter 2.5 microns in diameter or less (PM2.5). These emissions were estimated using the URBEMIS2007, Version 9.2.4 model. It was assumed that construction of each well would begin in June 2010 and last approximately 2 months.[1]

Construction is expected to occur in four phases, and none would occur concurrently. Each phase has the following estimated duration:

- Site Preparation—1 day
- Well Drilling—14 days
- Well Consturction—30 days
- Pump Installation—7 days

Based on the information summarized in the project description, the following assumptions were made for the emissions modeling:

- Each well would disturb an area of approximately 0.23 acres (100 feet by 100 feet)
- A daily maximum of 0.06 acres would be disturbed (a default assumption of one-quarter the total acreage; this ensures a conservative analysis of a worst-case scenario).

Table A-1 summarizes the pieces of diesel-powered construction equipment assumed in the emissions modeling. URBEMIS default values were used for equipment horsepower and load factors.

[1] While construction of each individual well will require approximately 2 months, not all 32 wells will be built concurrently. Rather, construction of the proposed wells will occur over a 6-24 month period.

Table A-1. Diesel-Powered Construction Equipment

Equipment		Number	Hours/day	Horsepower	Load Factor
Site Preparation					
	Backhoe	1	12	108	0.55
Well Drilling					
	Drill Rig	1	24	291	0.75
Well Construction					
	Crane	1	4	339	0.43
	Backhoe	1	4	108	0.55
	Pump	1	24	53	0.74
	Water Truck	1	8[a]	189	0.5
Pump Installation					
	Backhoe	1	8	108	0.55
	Crane	1	8	339	0.43
	Other Equipment	1	8	190	0.62
	Water Truck	1	8[a]	189	0.50

[a] URBEMIS default.

In addition to the diesel-powered construction equipment summarized in Table A-1, one light-duty gasoline-powered truck will travel one mile onsite per day during all construction phases. Emissions associated with this vehicle were quantified using URBEMIS.

Emissions from on-road workforce traffic and off-road diesel-powered delivery trucks were estimated using the number of workers per phase and the estimated delivery truck vehicle miles traveled (VMT). It was assumed that each phase would require 5 employees and that each employee would make 2 trips per day to the construction site (total of 10 trips per day). During the well construction and installation phases, it was assumed that one diesel-powered delivery truck would travel 40 miles offsite per day.

Because 32 wells would be construction under the Proposed Action, the emissions estimated by URBEMIS for the construction of a single well were multiplied by 32 to obtain total emissions.

B.1.2 GHG Emissions

GHG emissions from construction activities are primarily the result of fuel use by construction equipment and worker trips. The primary GHG emissions generated

by construction activities are carbon dioxide (CO_2), methane (CH_4), and nitrous oxides (N_2O).

CO_2 emissions were estimated using URBEMIS2007 and the assumptions described above. URBEMIS does not quantify CH_4 and N_2O emissions from off-road equipment or worker commutes. Emissions of CH_4 and N_2O from diesel equipment were determined by scaling the construction CO_2 emissions predicted by URBEMIS by the ratio of CH_4/CO_2 and N_2O/CO_2 emissions expected per gallon of diesel fuel according to the California Climate Action Registry (CCAR) (CCAR 2009). GHG emissions from worker and vendor commutes were determined by dividing the annual CO_2 emissions from construction worker and vendor commutes by 0.95. This statistic is based on the U.S. environmental Protection Agency's (EPA's) recommendation that CH_4, N_2O, and other GHG emissions account for 5% of on-road emissions (EPA 2009).

In order to simplify reporting and analysis, methods have been set forth to describe emissions of GHGs in terms of a single gas. The most commonly accepted method to compare GHG emissions is the "global warming potential" (GWP) methodology defined in the Intergovernmental Panel on Climate Change (IPCC) reference documents (IPCC 1996, 2001). The IPCC defines the GWP of various GHG emissions on a normalized scale that recasts all GHG emissions in terms of CO_2 equivalents (CO_2e), which compares the gas in question to that of the same mass of CO_2 (CO_2 has a GWP of 1 by definition).

Calculated emissions of CO_2, CH_4, and N_2O were converted to CO_2e and multiplied by 32 to obtain total construction emissions for the Proposed Action.

B.2 Project Operations

B.2.1 Criteria Air Pollutants

Given the limited nature and extent of maintenance activities, criteria pollutant emissions associated with operation of the Proposed Action were assumed to be minimal and were not quantified.

B.2.2 GHG Emissions

Operational-GHG emissions would be produced by electricity usage required for well pumping. The water-related energy proxy for the San Joaquin River (California Energy Commission 2006) was used to estimate annual electricity usage for each well based on their yearly production capacity (Table A-2).

Table A-2. Yearly Production Capacity and Estimated Annual Electricity Usage for Region 1 Wells

Well ID	Production (AF/Yr)	Electricity (MW/Yr)	Well ID	Production (AF/Yr)	Electricity (MW/Yr)
5	750	219	78	360	105
28	1,260	368	80	400	117
29	200	58	82	317	93
31	1,260	368	84	345	101
32	1,260	368	86	460	134
33.1	1,260	368	90	350	102
33.2	1,260	368	91	230	67
35	1,260	368	94	172	50
14	500	146	96	230	67
38	340	99	97	290	85
50	270	79	101	700	204
51	430	126	102	450	131
54	425	124	120	500	146
55	225	66	121	600	175
59	80	23	122	550	161
64	500	146	78	360	105
67	450	131		**Total**	**5,164**

Because the project would receive electricity generated by Pacific Gas and Electric Company (PG&E), the PG&E CO_2 emission factor was used to calculate CO_2 emissions (PG&E 2007). State-specific emission factors for CH_4 and N_2O were obtained from CCAR as PG&E currently does not calculate these emission factors (CCAR 2009). Table A-3 summarizes the GHG emission factors used in this analysis.

Table A-3. GHG Emission Factors for Electricity Consumption

Greenhouse Gas	Emission Factor (pounds per mega-hour)
Carbon Dioxide	635.67
Methane	0.0302
Nitrous Oxide	0.0081
Sources: PG&E 2007; CCAR 2009.	

The emissions calculated for each well were converted to CO_2e and summed to obtain total operational emissions.

B.3 References

California Climate Action Registry. 2009. Climate Action Registry General Reporting Protocol Version 3.1. January. Available: <http://www.climateregistry.org/resources/docs/protocols/grp/GRP_3.1_January2009.pdf>. Accessed: April 19, 2010.

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U.S. Environmental Protection Agency. 2009. *Emission Facts. Greenhouse Gas Emissions from a Typical Passenger Car.* Last Revised: November 24, 2009. Available: <http://www.epa.gov/OMS/climate/420f05004.htm>. Accessed: January 13, 2010.

Appendix C USFWS and CNDDB Special-Status Species Lists

U.S. Fish & Wildlife Service

Sacramento Fish & Wildlife Office

Federal Endangered and Threatened Species that Occur in or may be Affected by Projects in the Counties and/or U.S.G.S. 7 1/2 Minute Quads you requested

Document Number: 100514032505

Database Last Updated: April 29, 2010

Quad Lists

Listed Species

Invertebrates

Branchinecta conservatio

Conservancy fairy shrimp (E)

Branchinecta lynchi

vernal pool fairy shrimp (T)

Desmocerus californicus dimorphus

valley elderberry longhorn beetle (T)

Lepidurus packardi

vernal pool tadpole shrimp (E)

Fish

Acipenser medirostris

green sturgeon (T) (NMFS)

Hypomesus transpacificus

Critical habitat, delta smelt (X)

delta smelt (T)

Oncorhynchus mykiss

Central Valley steelhead (T) (NMFS)

Critical habitat, Central Valley steelhead (X) (NMFS)

Oncorhynchus tshawytscha

Central Valley spring-run chinook salmon (T) (NMFS)

winter-run chinook salmon, Sacramento River (E) (NMFS)

Amphibians

Ambystoma californiense

California tiger salamander, central population (T)

Rana draytonii

California red-legged frog (T)

Critical habitat, California red-legged frog (X)

Reptiles

Gambelia (=Crotaphytus) sila

blunt-nosed leopard lizard (E)

Thamnophis gigas

giant garter snake (T)

Birds

Vireo bellii pusillus
Least Bell's vireo (E)

Mammals

Dipodomys nitratoides exilis
Fresno kangaroo rat (E)

Neotoma fuscipes riparia
riparian (San Joaquin Valley) woodrat (E)

Sylvilagus bachmani riparius
riparian brush rabbit (E)

Vulpes macrotis mutica
San Joaquin kit fox (E)

Plants

Amsinckia grandiflora
large-flowered fiddleneck (E)

Proposed Species

Amphibians

Rana draytonii
Critical habitat, California red-legged frog (PX)

Quads Containing Listed, Proposed or Candidate Species:

HOWARD RANCH (404A)
CROWS LANDING (424A)
PATTERSON (424B)
NEWMAN (424D)
WESTLEY (443C)
VERNALIS (444A)
TRACY (444B)
SOLYO (444D)

County Lists

No county species lists requested.

Key:

(E) *Endangered* - Listed as being in danger of extinction.

(T) *Threatened* - Listed as likely to become endangered within the foreseeable future.

(P) *Proposed* - Officially proposed in the Federal Register for listing as endangered or threatened.

(NMFS) Species under the Jurisdiction of the National Oceanic & Atmospheric Administration Fisheries Service. Consult with them directly about these species.

Critical Habitat - Area essential to the conservation of a species.

(PX) *Proposed Critical Habitat* - The species is already listed. Critical habitat is being proposed for it.

(C) *Candidate* - Candidate to become a proposed species.

(V) Vacated by a court order. Not currently in effect. Being reviewed by the Service.

(X) *Critical Habitat* designated for this species

Important Information About Your Species List

How We Make Species Lists

We store information about endangered and threatened species lists by U.S. Geological Survey 7½ minute quads. The United States is divided into these quads, which are about the size of San Francisco.

The animals on your species list are ones that occur within, **or may be affected by** projects within, the quads covered by the list.

- Fish and other aquatic species appear on your list if they are in the same watershed as your quad or if water use in your quad might affect them.
- Amphibians will be on the list for a quad or county if pesticides applied in that area may be carried to their habitat by air currents.
- Birds are shown regardless of whether they are resident or migratory. Relevant birds on the county list should be considered regardless of whether they appear on a quad list.

Plants

Any plants on your list are ones that have actually been observed in the area covered by the list. Plants may exist in an area without ever having been detected there. You can find out what's in the surrounding quads through the California Native Plant Society's online Inventory of Rare and Endangered Plants.

Surveying

Some of the species on your list may not be affected by your project. A trained biologist and/or botanist, familiar with the habitat requirements of the species on your list, should determine whether they or habitats suitable for them may be affected by your project. We recommend that your surveys include any proposed and candidate species on your list. See our Protocol and Recovery Permits pages.

For plant surveys, we recommend using the Guidelines for Conducting and Reporting Botanical Inventories. The results of your surveys should be published in any environmental documents prepared for your project.

Your Responsibilities Under the Endangered Species Act

All animals identified as listed above are fully protected under the Endangered Species Act of 1973, as amended. Section 9 of the Act and its implementing regulations prohibit the take of a federally listed wildlife species. Take is defined by the Act as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect" any such animal.

> Take may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or shelter (50 CFR §17.3).

Take incidental to an otherwise lawful activity may be authorized by one of two procedures:

- If a Federal agency is involved with the permitting, funding, or carrying out of a project that may result in take, then that agency must engage in a formal consultation with the Service.

  During formal consultation, the Federal agency, the applicant and the Service work together to avoid or minimize the impact on listed species and their habitat. Such consultation would result in a biological opinion by the Service addressing the anticipated effect of the project on listed and proposed species. The opinion may authorize a limited level of incidental take.

- If no Federal agency is involved with the project, and federally listed species may be taken as part of the project, then you, the applicant, should apply for an incidental take permit. The

Service may issue such a permit if you submit a satisfactory conservation plan for the species that would be affected by your project.

Should your survey determine that federally listed or proposed species occur in the area and are likely to be affected by the project, we recommend that you work with this office and the California Department of Fish and Game to develop a plan that minimizes the project's direct and indirect impacts to listed species and compensates for project-related loss of habitat. You should include the plan in any environmental documents you file.

Critical Habitat

When a species is listed as endangered or threatened, areas of habitat considered essential to its conservation may be designated as critical habitat. These areas may require special management considerations or protection. They provide needed space for growth and normal behavior; food, water, air, light, other nutritional or physiological requirements; cover or shelter; and sites for breeding, reproduction, rearing of offspring, germination or seed dispersal.

Although critical habitat may be designated on private or State lands, activities on these lands are not restricted unless there is Federal involvement in the activities or direct harm to listed wildlife.

If any species has proposed or designated critical habitat within a quad, there will be a separate line for this on the species list. Boundary descriptions of the critical habitat may be found in the Federal Register. The information is also reprinted in the Code of Federal Regulations (50 CFR 17.95). See our Map Room page.

Candidate Species

We recommend that you address impacts to candidate species. We put plants and animals on our candidate list when we have enough scientific information to eventually propose them for listing as threatened or endangered. By considering these species early in your planning process you may be able to avoid the problems that could develop if one of these candidates was listed before the end of your project.

Species of Concern

The Sacramento Fish & Wildlife Office no longer maintains a list of species of concern. However, various other agencies and organizations maintain lists of at-risk species. These lists provide essential information for land management planning and conservation efforts. More info

Wetlands

If your project will impact wetlands, riparian habitat, or other jurisdictional waters as defined by section 404 of the Clean Water Act and/or section 10 of the Rivers and Harbors Act, you will need to obtain a permit from the U.S. Army Corps of Engineers. Impacts to wetland habitats require site specific mitigation and monitoring. For questions regarding wetlands, please contact Mark Littlefield of this office at (916) 414-6580.

Updates

Our database is constantly updated as species are proposed, listed and delisted. If you address proposed and candidate species in your planning, this should not be a problem. However, we recommend that you get an updated list every 90 days. That would be August 12, 2010.

California Department of Fish and Game
Natural Diversity Database
Selected Elements by Scientific Name - Portrait
ARRA Wells Region 1, 5/14/2010

	Scientific Name/Common Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
1	Actinemys marmorata western pond turtle	ARAAD02030			G3G4	S3	SC
2	Agelaius tricolor tricolored blackbird	ABPBXB0020			G2G3	S2	SC
3	Ambystoma californiense California tiger salamander	AAAAA01180	Threatened	unknown code...	G2G3	S2S3	SC
4	Amsinckia grandiflora large-flowered fiddleneck	PDBOR01050	Endangered	Endangered	G1	S1	1B.1
5	Anthicus sacramento Sacramento anthicid beetle	IICOL49010			G1	S1	
6	Antrozous pallidus pallid bat	AMACC10010			G5	S3	SC
7	Astragalus tener var. tener alkali milk-vetch	PDFAB0F8R1			G1T1	S1.1	1B.2
8	Athene cunicularia burrowing owl	ABNSB10010			G4	S2	SC
9	Atriplex cordulata heartscale	PDCHE040B0			G2?	S2.2?	1B.2
10	Atriplex minuscula lesser saltscale	PDCHE042M0			G1	S1.1	1B.1
11	Atriplex persistens vernal pool smallscale	PDCHE042P0			G2	S2.2	1B.2
12	Blepharizonia plumosa big tarplant	PDAST1C011			G1	S1.1	1B.1
13	Branta hutchinsii leucopareia cackling (=Aleutian Canada) goose	ABNJB05035	Delisted		G5T4	S2	
14	Buteo swainsoni Swainson's hawk	ABNKC19070		Threatened	G5	S2	
15	California macrophylla round-leaved filaree	PDGER01070			G3	S3.1	1B.1
16	Caulanthus coulteri var. lemmonii Lemmon's jewel-flower	PDBRA0M0E0			G4T2	S2.2	1B.2
17	Ceratochrysis menkei Menke's cuckoo wasp	IIHYM71050			G1	S1	
18	Cirsium crassicaule slough thistle	PDAST2E0U0			G2	S2.2	1B.1
19	Coastal and Valley Freshwater Marsh	CTT52410CA			G3	S2.1	
20	Coccyzus americanus occidentalis western yellow-billed cuckoo	ABNRB02022	Candidate	Endangered	G5T3Q	S1	
21	Coreopsis hamiltonii Mt. Hamilton coreopsis	PDAST2L0C0			G2	S2.2	1B.2
22	Desmocerus californicus dimorphus valley elderberry longhorn beetle	IICOL48011	Threatened		G3T2	S2	
23	Eremophila alpestris actia California horned lark	ABPAT02011			G5T3Q	S3	

	Scientific Name/Common Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
24	Eriastrum tracyi Tracy's eriastrum	PDPLM030C0		Rare	G1Q	S1.1	1B.2
25	Eryngium racemosum Delta button-celery	PDAPI0Z0S0		Endangered	G2Q	S2.1	1B.1
26	Eschscholzia rhombipetala diamond-petaled California poppy	PDPAP0A0D0			G1	S1.1	1B.1
27	Eumops perotis californicus western mastiff bat	AMACD02011			G5T4	S3?	SC
28	Falco columbarius merlin	ABNKD06030			G5	S3	
29	Falco mexicanus prairie falcon	ABNKD06090			G5	S3	
30	Great Valley Cottonwood Riparian Forest	CTT61410CA			G2	S2.1	
31	Great Valley Valley Oak Riparian Forest	CTT61430CA			G1	S1.1	
32	Lanius ludovicianus loggerhead shrike	ABPBR01030			G4	S4	SC
33	Lasiurus cinereus hoary bat	AMACC05030			G5	S4?	
34	Lytta moesta moestan blister beetle	IICOL4C020			G2	S2	
35	Madia radiata showy golden madia	PDAST650E0			G2	S2.1	1B.1
36	Malacothamnus hallii Hall's bush-mallow	PDMAL0Q0F0			G1Q	S1.2	1B.2
37	Masticophis flagellum ruddocki San Joaquin whipsnake	ARADB21021			G5T2T3	S2?	SC
38	Neotoma fuscipes riparia riparian (=San Joaquin Valley) woodrat	AMAFF08081	Endangered		G5T1Q	S1	SC
39	Perognathus inornatus inornatus San Joaquin pocket mouse	AMAFD01061			G4T2T3	S2S3	
40	Phacelia phacelioides Mt. Diablo phacelia	PDHYD0C3Q0			G1	S1.2	1B.2
41	Phrynosoma blainvillii coast horned lizard	ARACF12100			G4G5	S3S4	SC
42	Pogonichthys macrolepidotus Sacramento splittail	AFCJB34020			G2	S2	SC
43	Rana boylii foothill yellow-legged frog	AAABH01050			G3	S2S3	SC
44	Rana draytonii California red-legged frog	AAABH01022	Threatened		G4T2T3	S2S3	SC
45	Spea hammondii western spadefoot	AAABF02020			G3	S3	SC
46	Sycamore Alluvial Woodland	CTT62100CA			G1	S1.1	
47	Sylvilagus bachmani riparius riparian brush rabbit	AMAEB01021	Endangered	Endangered	G5T1	S1	

	Scientific Name/Common Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
48	Symphyotrichum lentum Suisun Marsh aster	PDASTE8470			G2	S2	1B.2
49	Taxidea taxus American badger	AMAJF04010			G5	S4	SC
50	Tropidocarpum capparideum caper-fruited tropidocarpum	PDBRA2R010			G1	S1.1	1B.1
51	Vulpes macrotis mutica San Joaquin kit fox	AMAJA03041	Endangered	Threatened	G4T2T3	S2S3	

Appendix D Response to Comments on the Draft Environmental Assessment

WINNEMEM WINTU TRIBE

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June 30, 2010

Shelly Hatleberg
Mid-Pacific Region
U.S. Bureau of Reclamation
2800 Cottage Way
Sacramento, CA 95825

Faxed to 916-978-5290
Sent Via e-mail to shatleberg@usbr.gov

Subject: Draft Environmental Assessment for the Construction of New Wells in San Joaquin Valley, Region 1

Dear Ms. Hatleberg:

The signatory groups have reviewed the Draft Environmental Assessment (DEA) and Draft Finding of No Significant Impact for the construction of 32 New Wells in Region 1 and submit the following comments and questions.

General Comments

We find that the use of $40 million to subsidize additional irrigation water supplies, resulting in cumulative groundwater overdraft, potential subsidence- especially along the Delta Mendota Canal, and toxic pollution makes no sense whatsoever and would have significant environmental effects. Increased cones of depression from the 32 wells could also cause regional contaminated groundwater to migrate into pumped areas, compromising pumped water quality. Because of these reasons detailed below, an Environmental Impact Statement (EIS) is required to analyze the significant environmental impacts and justify this enormous expenditure of public funds for the benefit of few western San Joaquin Valley growers. Coalition-1

Purpose and Need

The DEA does not adequately describe the project. Which districts receive water pumped from the new wells? Would beneficiaries only be the districts within which the wells are located? Can that water be transferred to other districts outside of the ones where the wells are located? What are the terms and conditions of this gift of public funds for private use? What compensation do the landowners where the wells are located receive? What is the cost/benefit analysis? What is the conveyance for the pumped groundwater? Is either the Delta Mendota Canal or the California Aqueduct to be utilized for conveyance? Is so, what are the impacts on other beneficial uses? Coalition-2

The Purpose and Need is narrowly limited to agricultural water supplies only. Why does it not include providing Level 4 water for wildlife refuges or funding for conveyance facilities for refuges? There is no justification to increase public subsidies for private profit while exacerbating regional groundwater overdraft, subsidence and water pollution? An EIS is required.

Impact Analysis- Section 3.1 Water Resources

The DEA fails to note that the Delta Mendota Canal (DMC) is used as conveyance for Municipal/Industrial (M&I) and refuge/wetland water supplies. There are CVP M&I contractors served by the DMC, and the Mendota Pool supplies water for refuges and wetlands in the Grasslands area. Additionally, upper DMC water mixes with State Water Project/California Aqueduct M&I water in San Luis Reservoir and/or the O'Neill Forebay. Are there other conveyance facilities to be used which supply M&I or refuge/wetland water supplies? Coalition-3

The DEA does not disclose if any water will be exported outside of county boundaries and if county permits for export of groundwater will be required. If pumped groundwater Coalition-4

is exchanged and/or replaced with surface water from outside of the county, will groundwater exports trigger a need for county permit(s)?

The DEA notes the existence of a San Joaquin County Groundwater Management Ordinance and a Groundwater Management Plan, but does not identify whether Merced or Stanislaus counties also have groundwater ordinances and plans. The DEA goes into great detail about county General Plan noise elements, but not the details of the groundwater management plans of the affected counties and the San Luis Delta Mendota Water Authority (SLDMWA). The DEA relies on the unspecified requirements of those groundwater management plans for a Finding of No Significant Impact, but does not identify the specific mitigation measures and monitoring requirements that could justify a FONSI. The revised environmental document should identify those requirements and mitigation measures. An EIS is required. Coalition-4 cont'd

Impact Water-2: Interference with Water Level in Nearby Wells- This section of the DEA tries to minimize potential impacts to adjacent wells by stating as follows:

"This potential lowering of groundwater elevations in the vicinity of existing wells is not a significant impact because it is assumed that adjacent wells are constructed to operate within the historical fluctuations that have occurred over the modeled period, existing wells also create cones of depression and pumps are set low enough in the well to deal with this phenomenon, and the districts and landowners would continue to operate according to the guidelines provided in the approved groundwater management plan, whereby the districts participate in monitoring groundwater levels and adjusting well use to ensure all users have an available supply." Coalition-5

However, the DEA fails to identify the guidelines in the approved groundwater management plan(s) that will reduce these impacts to less than significant. Additionally, the modeling (Figure 3.1-3) shows some wells lowering adjacent confined aquifer groundwater over 10 feet (the DEA does not disclose how much more than 10 feet it is).

There are no monitoring requirements and no mitigation measures identified to ensure that adjacent wells are not impacted. The analysis does not support a FONSI and an EIS should be prepared.

Impact Water-3: Increased Pumping Contributes to Overdraft of Regional Groundwater Basin- The evidence presented in the model does not support a FONSI for this impact, particularly for the deeper confined aquifer wells. Figure 3.1-4 identifies that the proposed project will reduce confined aquifer levels by up to 40 feet to an elevation as low as 20 feet above mean sea level (msl), well below the historical range of 60 to 70 feet above msl. The DEA tries to justify the extreme drawdown of the regional aquifer by stating that it recovers quickly after periods of no pumping during winter months, but there is no assurance that well usage will be restricted during any future time period or who would monitor this, only an assumption that pumping will be reduced at some undisclosed point in the future. Will the pumping make the region Coalition-6

more vulnerable to long-term drawdown of the aquifers if dry years return soon and persist for long periods?

There are clearly significant impacts of the proposed action which contributes to overdraft of the regional groundwater basin that is already overdrafted even without the proposed project. An EIS should be prepared. Coalition-6 cont'd

Impact Water-4: Increased Pumping Contributes to Land Subsidence- The information in the DEA does not support a FONSI for this impact. Given that the regional confined groundwater will decline outside of historic ranges (from 60 feet msl down to 20 feet msl) due to the Proposed Action (Figure 3.1-4), it should be assumed that land subsidence WILL occur. The DEA fails to justify a FONSI for this impact by stating that with implementation of the proposed project groundwater elevations will remain at "historic levels", when in fact, they will go as much as 40 feet below historic levels. There is no monitoring plan to determine if the project is resulting in subsidence or a mitigation measure to halt pumping if subsidence is detected. The Delta Mendota Canal already has had subsidence problems limiting its capacity. There is no analysis whatsoever of how this project may affect subsidence along the DMC or other conveyance facilities, and the estimated costs of mitigating that impact. An EIS should be prepared. Coalition-7

Impact Water-5: Increased Pumping Increases Salinity of Applied Water and Damages Sensitive Crops- The information in the DEA does not support a FONSI for this impact, nor does it properly identify other beneficial uses and water quality impacts from harmful substances such as selenium that would require monitoring and mitigation. There is no modeling or studies presented to indicate that water quality degradation will not occur, just unsubstantiated assurances. Even though the intended use of the water is agriculture, if the pumped groundwater goes into the Delta Mendota Canal or other conveyance facilities, it is also mixing with water supplied to refuges, wetlands and M&I users. Because there is a potential to contaminate state water supplies with selenium, mercury, and other harmful substances, a Clean Water Act NPDES permit is required. USEPA stated that an NPDES permit is required for a similar groundwater pumping project into the California Aqueduct proposed by Westlands Water District.[1] Coalition-8

The 2 µg/l selenium Basin Plan water quality objective for the Grasslands wetland water supply channels must be met for water in the DMC in particular, but there is no plan to monitor or mitigate for this potential impact. Increased cones of depression from the 32 wells could also cause regional contaminated groundwater to migrate into pumped areas, causing blending that would compromise pumped water quality. The potential of this hydrogeologic process should be evaluated as part of an EIS. Blending of contaminated groundwater resulting from the proposed project may not be adequate mitigation to protect some beneficial uses such as wetlands and refuges. An EIS should be prepared.

[1] http://www.c-win.org/webfm_send/73, accessed 6/28/10.

Impact Water-6: Increased Pumping Increases Salinity of Drainage Water and Groundwater below Irrigated Lands- This particular section only discusses salinity and thus completely fails to consider selenium buildup that already occurs regionally in groundwater as a result of providing additional irrigation water. Because of the need to leach accumulated salt out of root zones, these lands cannot be irrigated without creating runoff contaminated with selenium, mercury, boron, molybdenum, arsenic, salt and pesticides. Some of this toxic pollution seeps into the San Joaquin River and Bay-Delta, with the remainder percolating downward and laterally into the various aquifers. The San Joaquin River and its tributaries are listed as impaired by salt, selenium, boron and agricultural contaminants under Section 303(d) of the Clean Water Act. Based on research by the U.S. Fish and Wildlife Service,[2] continued selenium discharges into the San Joaquin River through the Grasslands Bypass Project alone results in 50% mortality of juvenile salmon and steelhead in the San Joaquin River, according to research biologist Dennis Lemly.[3] The DEA fails to disclose the amounts and concentrations of selenium and other contaminants that the proposed project will discharge into the regional aquifers and the San Joaquin River. Coalition-9

The DEA grossly downplays the fact that the region has chronic toxic high groundwater as a result of irrigating toxic soils (see Figure 5 below from the *Management Plan for Agricultural Subsurface Drainage and Related Problems on the Westside San Joaquin Valley* (1990)[4]) by justifying that a little bit more isn't a big deal. There is no modeling to estimate how much pollution will be created.[5] There is no cost/benefit analysis of the economic sense of the proposed action. How can public funds justifiably be used to increase public pollution for private profit? The public is paying for the pollution already through projects such as the Grasslands Bypass Project, loss of wildlife and human health impacts. The various loans, grants, crop subsidies, CVP "project use energy" and other forms of financial subsidies have already gone into these irrigated lands for private profit. Where is the justification to increase subsidies and pollution of aquifers and the Bay-Delta to maintain farm profits? A FONSI cannot be justified. Coalition-10

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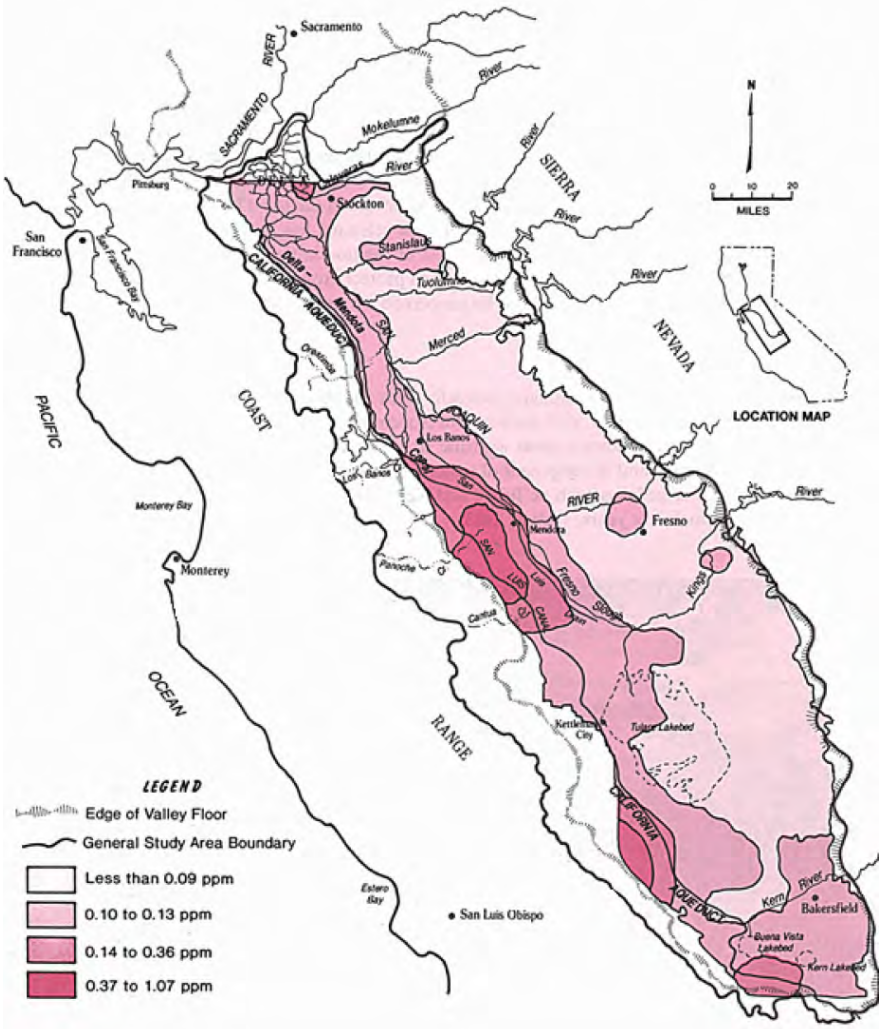
[2] http://wwwrcamnl.wr.usgs.gov/Selenium/Library_articles/Beckon_and_Maurer_Effects_of_Se_on_Listed_Species_SLD_2008.pdf .accessed 6/29/10.
[3] http://www.c-win.org/webfm_send/9, accessed 6/28/10.
[4] http://www.c-win.org/webfm_send/10 , accessed 6/28/10.
[5] For an example of estimating drainage created by irrigation in this region, see USBR. Broadview Water Assignment Project Draft EA/FONSI. April 2004 p 4-2.

Figure 5
SELENIUM CONCENTRATIONS IN SOILS
(Total Selenium in Top 12 Inches of Soil)



Adapted fromTidball et.,al.,1986

The environmental documentation should specifically include disclosure of how much toxic drainage will be created by the proposed project from irrigating toxic soils that would not otherwise be irrigated. A revised environmental document—preferably as an environmental impact statement—should also include a full cost/benefit analysis that considers the various water, crop and energy subsidies along with the cost of treatment of the estimated amount of toxic drainage created by irrigating the additional acreage that would not otherwise be irrigated. Coalition-10 cont'd

Based on the San Luis Drainage Feature Re-evaluation economic analysis by the Bureau of Reclamation, we believe that the project cannot be justified economically because land retirement is the most cost effective option to treat drainage.[6] Therefore,

[6] Table N-10 from the San Luis Drainage Feature Re-Evaluation Final EIS, Appendix N, pg 17. http://www.usbr.gov/mp/nepa/nepa_projdetails.cfm?Project_ID=61; accessed 6/28/10.

using public funds to subsidize additional irrigation water supplies to further deplete overdrafted aquifers and creating toxic pollution in the process makes no sense whatsoever. An EIS is required to justify this enormous expenditure of public funds for the benefit of few and a cost to many. Retirement of some lands with high groundwater problems instead of drilling wells should have been considered as an alternative. Coalition-10 cont'd

The State Water Resources Control Board has stated, "*Drainage problems in the San Joaquin Valley threaten water quality, agriculture, fish and wildlife, and public health….The USBR's actions have caused reduced water quality of the San Joaquin River at Vernalis.*"[7] The DEA fails to address the State Water Board's concerns that USBR make progress in reducing water quality problems. By generating additional irrigation drainage from pumped groundwater, the proposed project is likely to exacerbate, rather than contribute to solving San Joaquin Valley drainage and water quality problems. Coalition-11

The signatories to this letter believe that irrigating lands contaminated with selenium, salt, boron and other harmful substances is a Wasteful and Unreasonable use of water in violation of Article X, Section 2 of the California Constitution and Water Code Section 100.

Impact Water-7: Reduced Surface Water as a Result of Groundwater Pumping- The DEA does not adequately substantiate that there will not be impacts to surface waters, in particular wetlands (which typically are lands where the water table reaches and exceeds the ground surface). The revised environmental document should include maps and charts showing distances and elevation differences for nearby wetlands, springs and seeps, and provide a narrative and analysis of the relationship between those areas and local groundwater. Again, the DEA provides vague and unsubstantiated assurances that no significant impacts will occur. An EIS is required. Coalition-12

Cumulative Impacts Water Resources- This region has faced historically severe pumping impacts such as groundwater overdraft, subsidence, increased salinity, and surface and subsurface water pollution. The DEA attempts but fails to offer convincing evidence that the proposed new wells will not cause significant water resource impacts from additional groundwater extraction impacts and increased agricultural pollution from irrigation of saline/seleniferous soils. The DEA fails in its cumulative impact analysis by only analyzing cumulative impacts of Reclamation's 42 proposed new wells, but not also the considerable number of private wells drilled in the region recently. The San Joaquin and Tulare basins are notorious for groundwater overdraft, subsidence,[8] and selenium pollution[9], and adding more pollution and groundwater overdraft is clearly a significant impact on the human environment requiring an EIS. An 8 percent increase in regional groundwater pumping from the federal project alone is a significant increase given that the absolute amount of groundwater pumped in the Valley is so large and Coalition-13

[7] State Water Resources Control Board, *Water Right Decision 1641*, pp. 85-86.
[88] http://pubs.usgs.gov/pp/1766/, p 98, accessed 6/29/10.
[9] http://pubs.usgs.gov/of/2008/1210/ , accessed 6/29/10.

unsustainable already. Combined with the unknown amount of additional private pumping in the west side that is increasing due to continuing dry conditions and low CVP water allocations, the impacts are clearly significant. An EIS is required. Coalition-13 cont'd

Impact Analysis- CVP Project Use Power

The DEA fails to identify the energy source for the proposed wells. If the energy source is CVP Project Use Power, then the analysis should include an evaluation of the impacts to CVP power customers such as Sacramento Municipal Utility District, Northern California Power Agency and Trinity Public Utilities District. Specifically, the analysis should include the increased cost of power to retail customers, the impact on low income disadvantaged populations, and the source of replacement power. Cumulatively, this should be analyzed in conjunction with plans for use of CVP Project Use Power for other purposes such as reverse osmosis drainage treatment within the San Luis Unit of the CVP and the impacts to CVP retail power customers. If the energy source is not CVP Project Use Power, what is it? How reliable is it as an energy source? Coalition-14

Conclusion

The proposed project cannot be justified under a Finding of No Significant Impact because of impacts to water resources, specifically groundwater overdraft, subsidence from groundwater overdraft and water quality degradation. An Environmental Impact Statement must be prepared. Coalition-15

Please add all signatories below to your public notification list for this project.

Sincerely,

Respectfully submitted,

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California Water Impact Network

Bill Jennings
Chairman Executive Director
California Sportfishing Protection Alliance

Jim Metropulos
Senior Advocate
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cc: Ken Salazar, Interior Secretary
David Hayes, Deputy Interior Secretary
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Dan Nelson, San Luis Delta-Mendota Water Authority

Alexis Strauss, USEPA
Charles Hoppin, Chairman SWRCB
Kate Hart, Chairman CVRWQCB
Lester Snow, Resources Secretary
John McCamman, Department of Fish and Game
Mark Cowin, Department of Water Resources

Appendix D Response to Comments on the Draft Environmental Assessment

D.1 Response to Comment Coalition-1

These new wells in Region 1 constitute approximately $9 million of Reclamation's total $40 million drought relief program funded through the American Recovery and Reinvestment Act of 2009 (ARRA). Reclamation has analyzed the impacts of the Proposed Action without determining that it would result in significant impacts, therefore, an environmental impact statement (EIS) is not required. Concerns relating to toxic pollution and contaminated groundwater, cumulative groundwater overdraft, and potential subsidence are further addressed and clarified in the following responses.

D.2 Response to Comment Coalition-2

The Proposed Action is described in Chapter 2 of the Draft Environmental Assessment (Draft EA). As stated on page 2-1, the new wells would provide additional water to landowners within the BBID, WSID, and DPWD, and the water would not be transferred outside the respective districts. Many of the wells are intended for use by the landowners where the wells would be placed, and district wells would be placed on district land. Hence, no compensation is necessary.

As described in the Draft EA, this water would be pumped directly into agricultural delivery systems, and would not be comingled with any municipal or refuge water supplies. The Delta Mendota Canal (DMC) or California Aqueduct (CA) would not be used to convey this water. Any future participation in water transfers between districts or movement outside the counties, including use of the DMC or CA for conveyance, would not be covered by the Proposed Action and would require separate environmental analysis prior to approval. According to the DPWD, water transfers between counties is not permitted.

Pursuant to NEPA, a cost/benefit analysis is not required for either an EA or an EIS.

Reclamation is providing funding to the Grassland Water District for new wells for refuge water supply. That action is described in a separate EA titled *American Recovery and Reinvestment Act of 2009 New Wells Project-Region 4.*

D.3 Response to Comment Coalition-3

The DMC and CA will not be used to convey this water supply; please refer to response D.2.

D.4 Response to Comment Coalition-4

The project description does not include moving water out of the county because the districts will use this water within their district and, therefore, are not planning to transfer the water outside of their district. The Draft EA specifically describes the existing groundwater management plans and regulations because the Proposed Action would result in additional groundwater pumping during drought conditions. The existing groundwater management plans of the SLDMWA are the most relevant, and the county groundwater management plans also would have jurisdiction over new wells in each county. Installing new wells is not limited by groundwater management plans; transfer of pumped water out of the county would require permits and/or environmental compliance documents if individual landowners or water districts contemplate this in the future.

D.5 Response to Comment Coalition-5

As discussed for response D.4, and provided in the Draft EA (p. 3-3), the most relevant groundwater management plan for Region 1 is the "Northern Agencies" plan prepared by SLDMWA (Boyle 2007). Pursuant to the plan, SLDMWA would monitor regional groundwater conditions (based on data collected by several entities) and evaluate the general condition of the groundwater basin. Reclamation will also continue to monitor groundwater conditions and develop its own hydrologic model in conjunction with the USGS as described in response D.7.

Using the database described in response D.7, Reclamation determined that six existing production wells are located within one-half mile of the planned Drought Relief wells and had the potential for the cones of depression to interfere with current pumping. Two other wells are in close proximity, but are screened in different intervals relative to the Corcoran Clay, and there is no potential for the pumping to interfere with these wells. These six existing production wells are irrigation wells, each operated by landowners within Del Puerto Water District or West Stanislaus Irrigation District. These wells are within districts that would continue to operate according to the SLDMWA "Northern Agencies" groundwater management plan, including monitoring groundwater levels. Therefore, it is appropriate to assume that these wells will continue to be operated in accordance with the management plan, and there would be no significant impacts as a result of installing the new wells.

D.6 Response to Comment Coalition-6

The actual groundwater pumping effects on the two regional aquifers (above and below the Corcoran Clay) are accurately described for *Impact Water-3* (pp. 3-10 through 3-11 of the Region 1 Draft EA) and on Figures 3.1-3 and 3.1-4 of the Draft EA. Although it is true that Figure 3.1-4 in the Region 1 Draft EA shows reductions in confined groundwater levels (Model Layer 6) of up to 40 feet, it also shows a quick recovery to near-baseline levels. The modeling results indicate that other cells would experience a smaller change in the groundwater elevations. In other words, the "worst case" presented in the Draft EA is both temporary and localized, and based on the *simulated* historical range of groundwater elevations.

Overdraft is a condition caused by pumping in excess of sustainable water yield that produces a long-term lowering of groundwater levels. The fluctuations in the simulated groundwater levels shown in the lower plots of Figure 3.1-4 of the Draft EA result from temporary, as opposed to long-term, reductions in groundwater pressure near the pumped well. Because the simulated groundwater elevations recover quickly each year when pumping is stopped, and the long-term groundwater elevations are not reduced, as compared with the historical groundwater elevation, there is no indication of overdraft in this portion of the confined (or unconfined) aquifer. There also is no indication from the modeling that the aquifer would be more vulnerable to long-term drawdown of the aquifer over extended dry periods as there are extended dry periods in the simulation.

Because the water is going to be supplied for irrigation, it is reasonable to assume that pumping would continue to be seasonal with no irrigation occurring in winter months.

D.7 Response to Comment Coalition-7

The Draft EA accurately describes the historical subsidence in the southern San Joaquin and Tulare groundwater basins. As described more fully in several of the referenced U.S. Geological Survey (USGS) reports (e.g., Bull & Miller 1975), the greatest subsidence was associated with specific locations where historical pumping (before surface deliveries from the DMC beginning in 1950 and from the California Aqueduct beginning in 1970) led to large reductions in groundwater elevations—primarily in the alluvial fans originating from the coastal range. In addition, there are no records of substantial (greater than 2 feet) historical subsidence in the vicinity of the new wells.

The Draft EA does refer to the existing groundwater management plans of the SLDMWA, which specifically consider the land subsidence risk associated with reduced groundwater elevations. These management plans specify the objective of maintaining groundwater elevations above the minimum historical groundwater elevations. The new wells will be subject to this regional groundwater elevation

objective and the associated monitoring and subsequent controls on pumping, if necessary to meet the objective.

As previously discussed, Reclamation has developed a well database containing a variety of well data (e.g., well types, groundwater levels, well screen intervals, subsidence measurements) compiled from the following sources: USGS and California Department of Water Resources (DWR) well databases; SLDMWA well database; Central California Irrigation District (CCID) map of well locations. This information was compiled as part of Reclamation's ongoing efforts to develop an integrated surface/subsurface hydrological model for the purpose of analyzing the impacts of additional groundwater pumping in terms of potential land subsidence along the DMC, California Aqueduct, and CCID canals. Additionally, the United States Geological Survey (USGS) is undertaking a separate monitoring project (funded in part by Reclamation) to evaluate possible relationships between groundwater conditions and land subsidence along the DMC. The study objective is to collect and analyze data to quantitatively define historical and current subsidence. The study will: (1) construct five well monitoring sites to provide information on geology, groundwater levels, and groundwater quality in the study area; (2) refurbish several subsidence measurement stations to provide information on current land subsidence at selected locations; (3) compare computed land subsidence to measured groundwater levels; and (4) utilize groundwater modeling to predict the magnitude and extent of future land subsidence. This project began in Fiscal Year 2010 and is expected to be completed in Fiscal Year 2012. The monitoring wells and information will be included in Reclamation's database and modeling efforts to understand and estimate impacts for future well development in the San Joaquin Valley.

D.8 Response to Comment Coalition-8

According to the 1990 San Joaquin Valley Drainage Program Final Report (San Joaquin Report) (U.S. Department of Interior (DOI) and California Resources Agency), there is no selenium-contaminated groundwater in the vicinity of the new wells. Although a local groundwater level "cone of depression" effect was described in Impact Water-2 (page 3-10 of the Draft EA), the actual water pumped from the new wells would not have a high selenium concentration.

No impacts associated with water quality in the DMC or CA were discussed because water from the proposed wells will not be conveyed in the DMC; refer to response D.2.

D.9 Response to Comment Coalition-9

The Draft EA properly described the increased concentrations of salt and other dissolved materials in drainage water below irrigated lands. However, because the selenium concentrations from the new wells would be similar to the selenium in currently delivered surface water, there would be no significant increase in selenium in the shallow drainage water that might be discharged to the San Joaquin River as a result of the new wells. Therefore, additional analysis is not required to determine impacts to the San Joaquin River or Bay-Delta ecosystem.

D.10 Response to Comment Coalition-10

Reclamation agrees that some irrigated lands in the San Joaquin Valley have relatively high soil concentrations of selenium. However, the discussion of Figure 5 from the San Joaquin Report (U.S. Department of Interior and California Resources Agency) showing concentrations of selenium in the top 12 inches of soil (i.e., saturated soil extract) more properly would have referenced and discussed Figure 8 from the same report showing selenium concentrations in shallow groundwater (less than 20-foot depth). Figure 8 identifies the more limited areas with high selenium concentrations in shallow groundwater, located along the west side of the San Joaquin Valley between Los Banos and Kettleman City. Most shallow groundwater has concentrations of less than 5 parts per billion (ppb) (5 micrograms per liter), with only specific areas having concentrations greater than 50 ppb. This report contains no information on selenium concentrations in the deeper aquifers. Region 1 soils and shallow groundwater are not in the areas identified as having high salinity and selenium content.

Pursuant to NEPA, Reclamation is not required to prepare a cost/benefit analysis for the new wells.

Water supplied by the wells would be used on existing agricultural lands and would not be used to put new lands in production. There would be no significant increase in drainage salt concentrations or selenium concentrations below the lands supplied by water from the new wells. Reclamation agrees that salinity and selenium management in the San Joaquin Valley should proceed using all available options, but the new wells would not contribute to these drainage problems.

D.11 Response to Comment Coalition-11

Reclamation is involved in many programs and projects in partnership with other Federal and California State agencies that are continuing to monitor and manage the portions of the San Joaquin Valley irrigated lands having shallow groundwater and associated high salinity and high selenium concentrations. The new wells

would not increase the selenium concentration of water applied to irrigated lands and would not be located in the specific areas with shallow groundwater and high selenium concentrations.

D.12 Response to Comment Coalition-12

The Draft EA includes aerial photograph maps of each proposed new well showing that the new wells are in agricultural lands. The potential effects of groundwater pumping on shallow groundwater elevations that are connected to wetlands or other surface waters were considered and found to be not significant because there are no connected wetlands or surface waters in the vicinity of the new wells.

D.13 Response to Comment Coalition-13

The Draft EA cumulative analysis includes the consideration of the new ARRA wells added to the historical wells and the other wells that have been constructed during recent dry years with reduced surface deliveries.

The quantitative analysis of cumulative effects is limited to Reclamation's other ARRA-funded new well projects. The Draft EA assumes that some additional wells likely would be drilled in the future without the ARRA funding, and that some wells have been drilled in recent dry years. However, the USGS model (CVHM) that was used to analyze the cumulative groundwater impacts was not adjusted to include these recent wells. Although the recent baseline pumping capacity may be slightly greater than simulated, the comparison of the baseline with all of the ARRA wells provides an accurate cumulative assessment.

The historical overdraft of many portions of the San Joaquin Valley and Tulare groundwater basins (regions) has been greatly reduced by the surface deliveries supplied by the DMC and the CA. The measured example groundwater elevations (shown in Figure 3.1-4 of the Draft EA) and the groundwater modeling results indicate that there are no longer overdraft conditions (long-term declining groundwater elevations) in the portions of the San Joaquin Valley where the new wells would be constructed. These new wells would contribute to the conjunctive use of groundwater to provide a more reliable agricultural water supply in years with reduced allocations. The cumulative groundwater pumping is sustainable as demonstrated in the historical records and modeling of groundwater elevations during the recent 60 years (with DMC deliveries).

D.14 Response to Comment Coalition-14

The wells would not receive CVP Project Use Power. The wells would be operated with power provided by the Pacific Gas and Electric Company (PG&E), a reliable source of power in the San Joaquin Valley. PG&E produces and purchases power from a wide range of sources, including hydroelectric, other renewable, and thermal. .

D.15 Response to Comment Coalition-15

The Proposed Action would not result in significant impacts. Therefore, an EIS is not necessary.