

**File Provided Natively**

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**From:** Spranza, John [John.Spranza@hdrinc.com]  
**Sent:** 7/5/2022 10:30:30 AM  
**To:** Kevin Spesert [kspesert@sitesproject.org]; Conner McDonald [conner@cmdwest.com]  
**CC:** Alicia Forsythe [aforsythe@sitesproject.org]; Risse, Danielle [Danielle.Risse@hdrinc.com]; Arsenijevic, Jelica [Jelica.Arsenijevic@hdrinc.com]  
**Subject:** Bio and Cultural Survey Access Needs.  
**Attachments:** Needed Bio and Cultural Survey Activities\_2022-0705.docx

Kevin and Conner,

As I mentioned in this morning's meeting, we have put together a list of top priority activities that we are hoping to get included into your access agreements. We're at the point where being able to do the Priority 1 items is key as the results will help us better refine our effects and mitigation needs, and get a better grip on the pre-construction clearance sequence and schedule. Priority 2 would be great as well to provide that next level of detail we will need.

If you would like to run through these I have from 9-3 open tomorrow and 9-4 on Thursday with the exception on 11-12.

Thanks,  
John

**John Spranza, MS, CCN**  
*Senior Ecologist / Regulatory Specialist*

**HDR**  
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[john.spranza@hdrinc.com](mailto:john.spranza@hdrinc.com)

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## Needed 2022-2024 Biological and Cultural Activities.

This list is provided to identify the high priority “needed” information for biological, cultural and mitigation planning for the two year access agreement:

### Priority 1 - Land Cover/Vegetation Mapping and Pedestrian Cultural Surveys

- Verify land cover mapping (visual and GPS)
- Wetland delineation (visual, GPSing soil pits, survey forms)
  - Soil samples from vernal pool wetlands to look for fairy shrimp eggs (approx. 4 cups)
- Botanical surveys (visual, plant collection for later ID)
- Visual surveys of aquatic habitat (including CRLF habitat assessment...forms)
- Pedestrian hydrological (cross-section, flow, substrate, etc.) and limited biological (water quality, and biota) surveys and placement of instrumentation within Antelope, Stone Corral, and Funks Creeks (flow gauges, weather station, etc)
- Archaeological and Built Environment Surveys (visual) - no collection/ground disturbance
  - Cultural specialists walking across the land in 15-30 meter apart transects.
  - Documenting archaeological resources and built environment resources (buildings and structures) that are 40 years old or older (recording a written description of the resources, GPSing the location, and taking photographs).
  - The field crew would consist of 2-5 people, and there maybe two separate visits needed (one for archaeology and one for built environment) and the crews would usually be in one place for only a few hours but could be in one place up to a day if something needs to be recorded.
  - Results of survey would be documented in reports and resource records which would be file at the state repository for such information and would then be available to tribes, cultural resources specialists, and other governmental agencies on an as needed basis.
  - No collection or ground disturbing activities would occur.

### Priority 2 - Species-Specific Surveys and Subsurface Testing For Known Archeological Sites

- Elderberry (visual and stem counts)
- Vernal pool fairy shrimp – wet and dry samples (if habitat present)
- Burrowing owl (visual)
- Small mammal (visual)
- Bat roost surveys (visual and acoustic)
- Nesting bird surveys (visual)
- Swainson’s hawk (visual , multiple times during nesting season)
- CRLF (visual, multiple visits through a year, including nighttime)
- Archaeological and Built Env. Surveys (visual, limited subsurface testing [shovel, GPR at cemeteries]) - collection would occur and analyzed , on site meetings with tribes and decedents
  - Limited subsurface testing in known archaeological sites or in areas with high sensitivity
  - roughly 1 foot diameter shovel probes and/or 1 to 2 meter square excavation units;
  - archaeological materials would be collected and analyzed, and the disposition determined by the land owner;
  - results would be documented in reports and resource records which would be handled as described above for the pedestrian survey.
  - Ground penetrating radar at the cemeteries (no ground disturbance other than rolling the machine across the area tested)
- Onsite meetings with tribes and descendants of individuals buried at the cemeteries

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**From:** Alicia Forsythe [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=A6CDF06A7E904B65BAA21702A82AD329-AFORSYTHE]  
**Sent:** 7/6/2022 1:30:33 PM  
**To:** Heydinger, Erin [erin.heydinger@hdrinc.com]  
**Subject:** FW: SPJPA Sites: Alternative 2 Memo and fishery assessment

See below.

-----  
Alicia Forsythe | Environmental Planning and Permitting Manager | Sites Project Authority | 916.880.0676 |  
[aforsythe@sitesproject.org](mailto:aforsythe@sitesproject.org) | [www.SitesProject.org](http://www.SitesProject.org)

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**From:** Laurie Warner Herson <laurie.warner.herson@phenixenv.com>  
**Sent:** Wednesday, July 6, 2022 1:26 PM  
**To:** Alicia Forsythe <aforsythe@sitesproject.org>  
**Subject:** FW: SPJPA Sites: Alternative 2 Memo and fishery assessment

For our 3:30 call - I don't know if John sent this to you or not but please see below for ICF fish team feedback on Alt 2 modeling.

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**From:** Moderan, Julien <Julien.Moderan@icf.com>  
**Sent:** Tuesday, June 28, 2022 3:45 PM  
**To:** John Spranza <John.Spranza@hdrinc.com>; Hendrick, Mike <Mike.Hendrick@icf.com>; Briard, Monique <Monique.Briard@icf.com>  
**Cc:** Laurie Warner Herson <laurie.warner.herson@phenixenv.com>  
**Subject:** RE: SPJPA Sites: Alternative 2 Memo and fishery assessment

Hi John,

Yes, we discussed this on Friday last week and the consensus among the Fishery team is that Alt 2 modeling results will be needed for the Final EIR/EIS. It would be too much of a stretch to show alt 2 compared to the other alternatives without updated modeling results and an updated baseline. The changes in Alt2 compared to the RDEIR/SDEIS are not large by any means, but not small enough to dismiss any further implication in the Aquatics analyses results and impact determinations without updated analyses.

A discussion tomorrow during our call sounds like a good plan, as, unsurprisingly, this might have implications in terms of our schedule.

Julien



**Julien Moderan**, Senior Fisheries Biologist  
+1 (415) 537 1716 – [Julien.Moderan@icf.com](mailto:Julien.Moderan@icf.com)  
[Fish and Aquatic Sciences | ICF](#)

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**From:** Spranza, John <[John.Spranza@hdrinc.com](mailto:John.Spranza@hdrinc.com)>  
**Sent:** Tuesday, June 28, 2022 3:33 PM  
**To:** Moderan, Julien <[Julien.Moderan@icf.com](mailto:Julien.Moderan@icf.com)>; Hendrick, Mike <[Mike.Hendrick@icf.com](mailto:Mike.Hendrick@icf.com)>; Briard, Monique <[Monique.Briard@icf.com](mailto:Monique.Briard@icf.com)>  
**Cc:** Laurie Warner Herson <[laurie.warner.herson@phenixenv.com](mailto:laurie.warner.herson@phenixenv.com)>  
**Subject:** RE: SPJPA Sites: Alternative 2 Memo and fishery assessment

Hi Julian,

I know Mike is on PTO, I wanted to make sure this is on your radar so we can discuss it during our call tomorrow. I think the Jacobs team is looking for some feedback this week.  
Thanks.

John Spranza

D 916.679.8858 M 618.640.2487

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**From:** Moderan, Julien <[Julien.Moderan@icf.com](mailto:Julien.Moderan@icf.com)>  
**Sent:** Thursday, June 23, 2022 10:59 AM  
**To:** Spranza, John <[John.Spranza@hdrinc.com](mailto:John.Spranza@hdrinc.com)>; Hendrick, Mike <[Mike.Hendrick@icf.com](mailto:Mike.Hendrick@icf.com)>; Briard, Monique <[Monique.Briard@icf.com](mailto:Monique.Briard@icf.com)>  
**Cc:** Laurie Warner Herson <[laurie.warner.herson@phenixenv.com](mailto:laurie.warner.herson@phenixenv.com)>  
**Subject:** RE: SPJPA Sites: Alternative 2 Memo and fishery assessment

CAUTION: [EXTERNAL] This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Good morning John,

*Have you guys brought this to the fishery team?* I think the answer is “not yet” (Mike, Monique, please correct me if I am wrong).

Nicole emailed the fish folks earlier today so it is now on our radars and we are adding it to our agenda for the team’s weekly Sites check-in tomorrow at 11am.

We will keep you informed of what comes out of that discussion asap. I think Nicole mentioned the Authority would want feedback **by next week** to make an informed decision on including or not a new complete set of Alt2 modeling results and analyses in the FEIR/EIS. Can you please confirm / offer precision on when exactly our input is needed?

Julien

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**From:** Spranza, John <[John.Spranza@hdrinc.com](mailto:John.Spranza@hdrinc.com)>  
**Sent:** Thursday, June 23, 2022 9:17 AM  
**To:** Hendrick, Mike <[Mike.Hendrick@icf.com](mailto:Mike.Hendrick@icf.com)>; Briard, Monique <[Monique.Briard@icf.com](mailto:Monique.Briard@icf.com)>; Moderan, Julien <[Julien.Moderan@icf.com](mailto:Julien.Moderan@icf.com)>  
**Cc:** Laurie Warner Herson <[laurie.warner.herson@phenixenv.com](mailto:laurie.warner.herson@phenixenv.com)>  
**Subject:** FW: SPJPA Sites: Alternative 2 Memo and fishery assessment

Hi,

Have you guys brought this to the fishery team? Nicole and Anne have looked at this through a CEQA/NEPA lens primarily for water quality components, but have we looked at whether or not we need to do additional fishery modeling (SALMOD, IOS,..) to be able to say that although we have not done all the follow-on modeling, the Caslim analysis in a comparative approach is sufficient to support the FEIR/EIS analysis?

John Spranza

D 916.679.8858 M 818.640.2487

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**From:** Laurie Warner Herson <[laurie.warner.herson@phenixenv.com](mailto:laurie.warner.herson@phenixenv.com)>  
**Sent:** Thursday, June 23, 2022 6:57 AM  
**To:** Heydinger, Erin <[erin.heydinger@hdrinc.com](mailto:erin.heydinger@hdrinc.com)>; Spranza, John <[John.Spranza@hdrinc.com](mailto:John.Spranza@hdrinc.com)>; Alicia Forsythe <[aforsythe@sitesproject.org](mailto:aforsythe@sitesproject.org)>  
**Subject:** FW: SPJPA Sites: Alternative 2 Memo

CAUTION: [EXTERNAL] This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

More thoughts from ICF, below.

By the way, my intent is to only update Reclamation on Alt 2 our ongoing work to identify an approach, not discuss a preferred approach since we are not there yet.

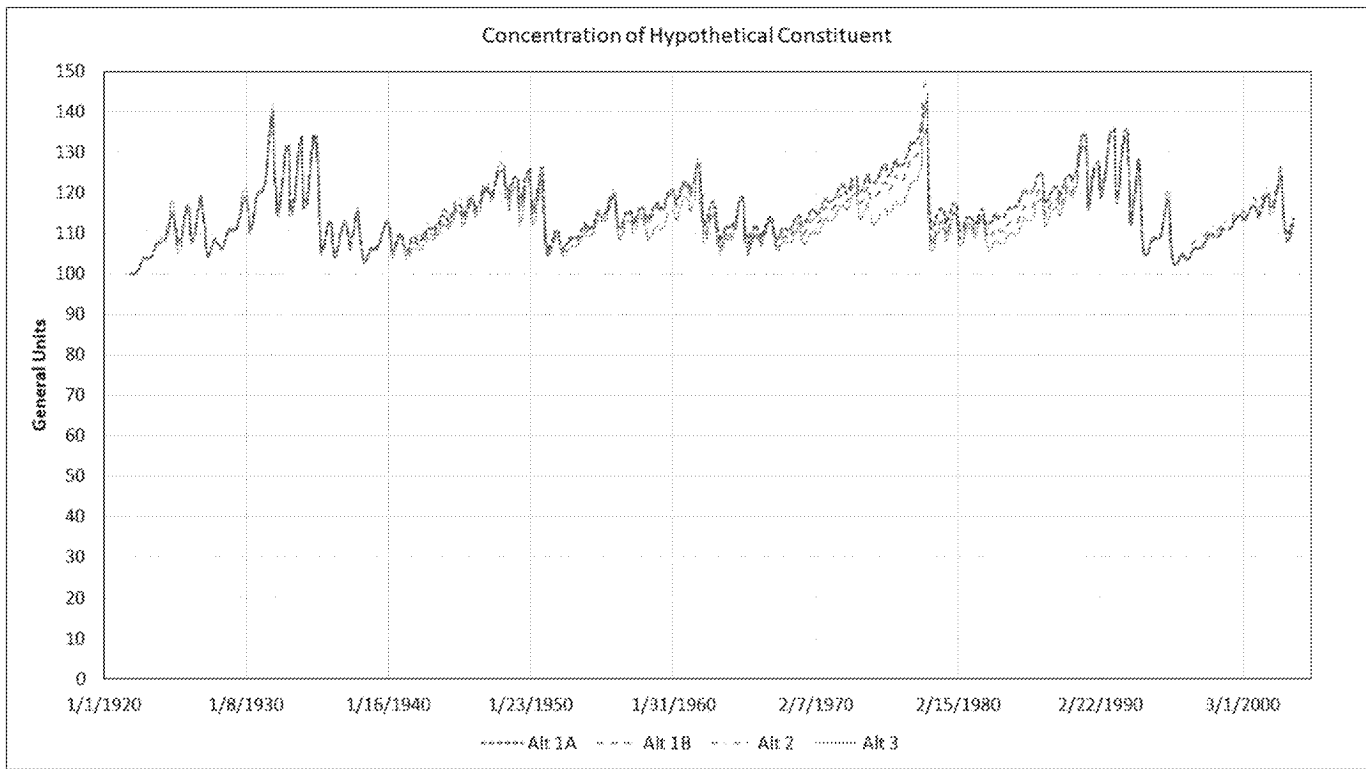
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**From:** Williams, Nicole <[Nicole.Williams@icf.com](mailto:Nicole.Williams@icf.com)>  
**Sent:** Thursday, June 23, 2022 6:48 AM  
**To:** Laurie Warner Herson <[laurie.warner.herson@phenixenv.com](mailto:laurie.warner.herson@phenixenv.com)>  
**Subject:** RE: SPJPA Sites: Alternative 2 Memo

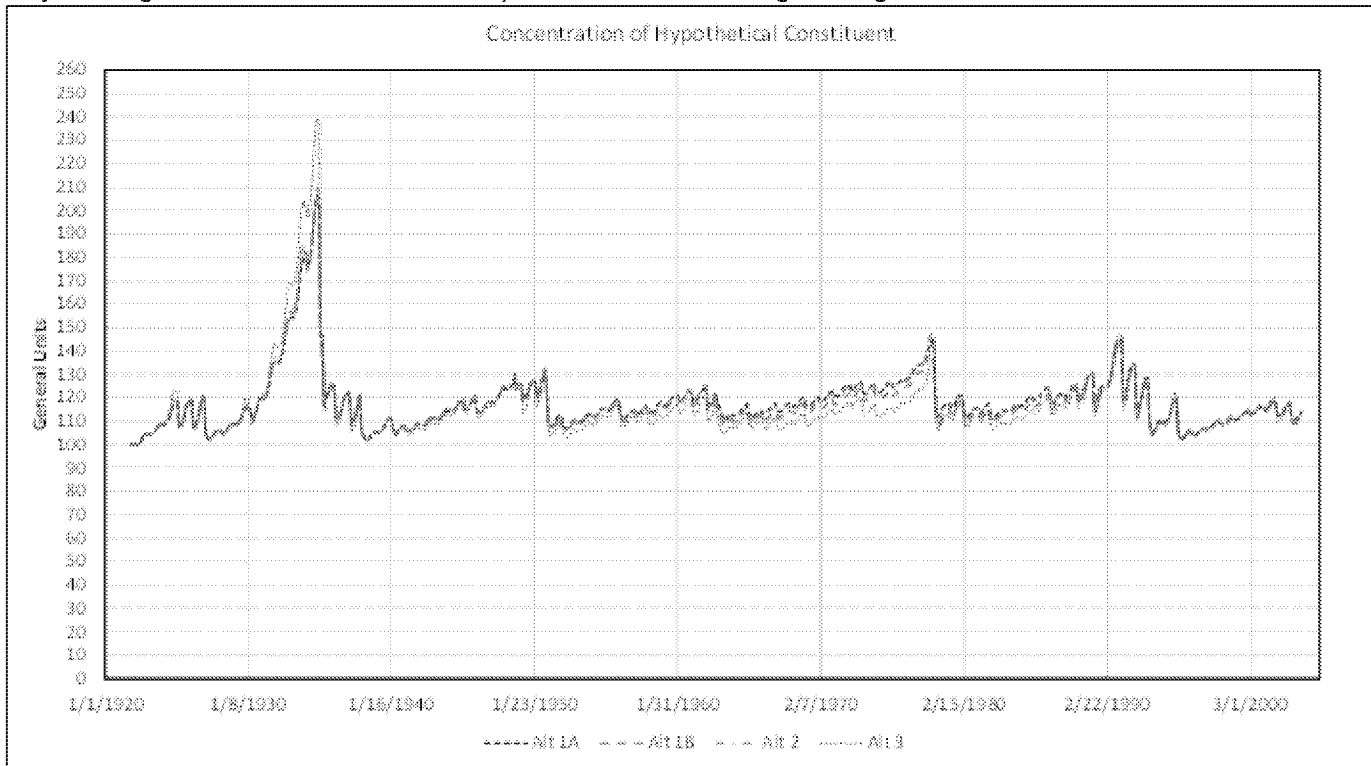
Morning Laurie, below is another example of #3 (practical application may present interesting challenges and result in oddities...) I think we probably need to discuss with Reclamation today that we are still working on this Alternative 2 issue and our hope is that we find an approach that doesn't require re-running all models for Alternative 2. But it may remain to be seen if we've found that actual approach. Cheers, Nicole

Evapoconcentration graphs show some issues and likely will need to say something about the new increase in concentration in the 1930s.

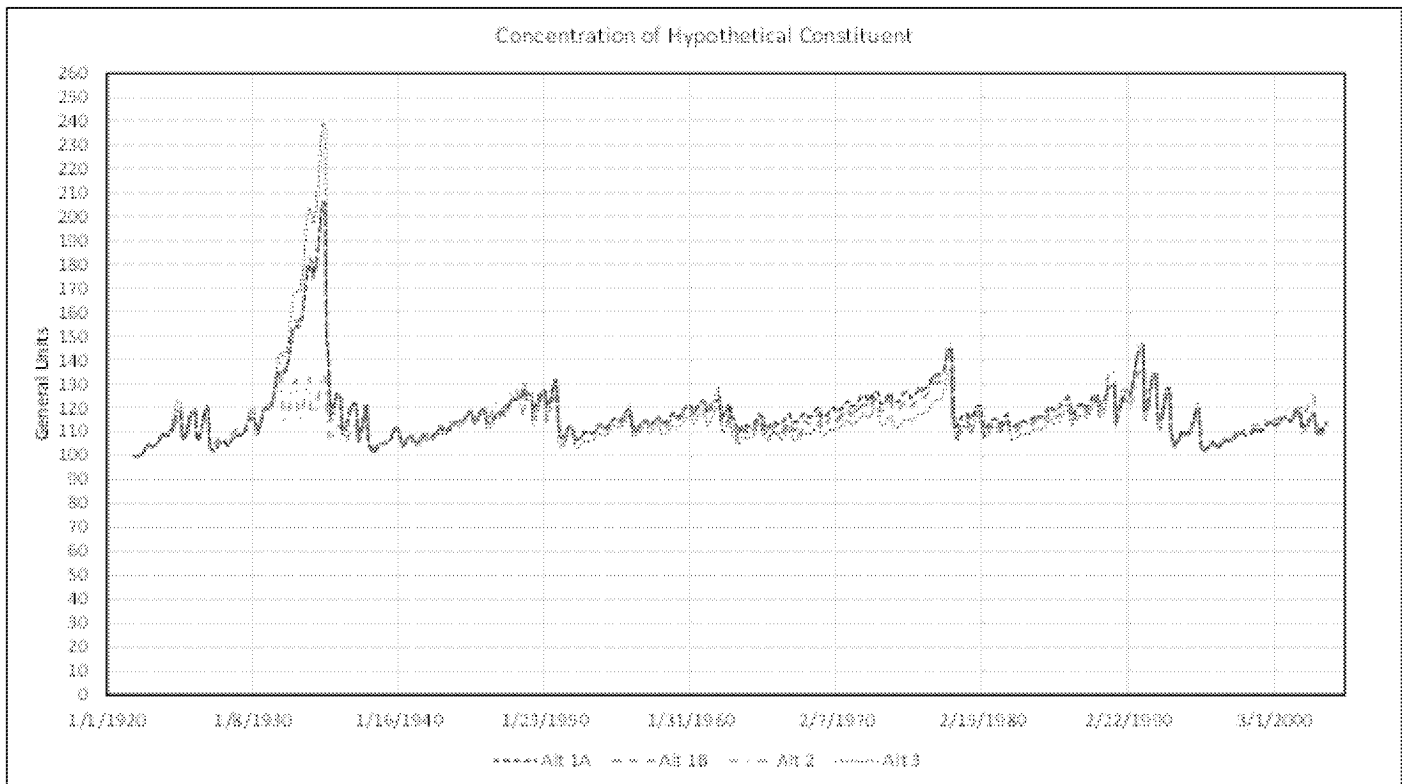
1. Original graph in RDEIR/SDEIS



2. Graph using full set of refined CalSim results including refined Alt 2 - didn't realize until now that there is a major change in the 1930s due to basically no diversions to storage during 1930 - 1935



3. Graph using new calsim results for 1A, 1B, and 3 and RDEIR/SDEIS Alt 2 results – you can see RDEIR/SDEIS Alt 2 down along the bottom when there was diversions to storage, but now apparently there are no diversions to storage under the refined modeled results



**NICOLE L. WILLIAMS**  
 Managing Director  
 ICF  
 o 916.231.9614  
 icf.com

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**From:** Williams, Nicole  
**Sent:** Wednesday, June 22, 2022 8:57 PM  
**To:** Laurie Warner Herson <laurie.warner.herson@phenixenv.com>  
**Subject:** RE: SPJPA Sites: Alternative 2 Memo

Hi Laurie,

Confirmed; received. Anne and I spoke briefly this afternoon. She may have additional thoughts, but I wanted to send you these initial thoughts.

In general the content that Jacobs provided shows:

- Changes to Alt 2 are small compared to results presented for Alt 2 in the RDEIR/SDEIS
- Changes are similar to what is observed in the refined modeled runs for Alt 1A, 1B, and 3

I think this generally means a new appendix could be included in the Final EIR/EIS with the content in the memo. The modelers would likely need to further explain why comparing RDEIR/SDEIS Alt 2 results to the baseline or the refined Alt1A, 1B, and 3 results doesn't result in anything "new" and/or fully discloses impacts. This might be somewhat similar to what was done for the supporting appendices Jacobs prepared for socioeconomic explaining why differences in the baseline and water supply results wouldn't result in any "worse" impacts as previously disclosed by the Draft 2017 modeling.

A Few Considerations:

1. Changes to “NAA” (modeled baseline): I’m not sure I realized changes to the modeled baseline was occurring, but now it can be seen in numeric form. The modelers may need to explain that the RDEIR/SDEIS modeled NAA and the Final EIR/EIS modeled NAA are essentially “the same” in a new appendix.
2. Potentially more input from the modelers and other technical folks to support why #1 wouldn’t result in substantial changes in “downstream models”. This may include describing the relationships in other models – I know the relationships aren’t always linear – so it may be somewhat challenging.
3. Practical application of merging refined results for Alt 1A, 1B and 3 with RDEIR/SDEIS results for Alt 2 in the Final EIR/EIS may present interesting challenges and result in oddities that could be complex to describe, in the event that we try. I asked Anne to pull together a few examples, and below is the one she was able to get to today. Please see below.

**TABLE 6-16 FROM RDEIR/SDEIS:**

**Table 6-16. X2: No Action Alternative (km) and Change between No Action and Alternatives 1, 2, and 3 (km)**

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
<b>Critically Dry Water Years</b>												
NAA (km)	92.9	92.4	87.6	83.5	77.2	76.7	79.0	84.1	87.2	89.6	91.5	93.0
Alt 1A Change	-1.3	-0.7	0.4	0.3	0.4	0.5	0.1	0.1	0.0	-0.3	-0.5	-0.5
Alt 1B Change	-1.2	-0.7	0.4	0.3	0.3	0.4	0.1	0.1	0.1	-0.3	-0.5	-0.6
Alt 2 Change	-1.2	-0.6	0.4	0.3	0.3	0.4	0.1	0.1	0.1	-0.3	-0.5	-0.4
Alt 3 Change	-0.8	-0.6	0.4	0.3	0.4	0.4	0.1	0.1	0.1	-0.2	-0.4	-0.3
<b>Wet Water Years</b>												
NAA (km)	78.7	79.5	75.3	57.5	54.8	55.5	56.7	59.3	65.4	73.6	81.0	78.4
Alt 1A Change	-0.3	0.1	0.3	0.1	0.0	0.1	0.0	0.0	0.1	0.1	-0.1	-0.3
Alt 1B Change	-0.3	0.2	0.2	0.1	0.0	0.1	0.0	0.0	0.1	0.1	-0.1	-0.3
Alt 2 Change	-0.3	0.2	0.2	0.1	0.0	0.1	0.0	0.0	0.1	0.1	-0.2	-0.4
Alt 3 Change	-0.3	0.2	0.2	0.0	0.0	0.1	0.0	0.0	0.1	0.1	-0.1	-0.3

**New Version that uses old X2 values for Alt 2. Changes in the Alt 2 differences relative to baseline are due to changes in NAA – This makes Alt 2 look better (decrease in X2) in critical years and worse (increase in X2) in wet years**

**Average X2 (km): Alternatives Compared to Baseline - Difference**

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
<b>Critical Years</b>												
Baseline (TAF)	92.6	92.2	87.7	83.8	77.5	76.9	79.0	84.1	87.1	89.5	91.5	92.9
Alt 1A Change	-0.3	-0.1	0.0	0.2	0.1	0.2	0.1	-0.1	-0.1	-0.3	-0.7	-0.7
Alt 1B Change	-0.2	0.0	0.0	0.2	0.1	0.2	0.1	0.0	0.0	-0.3	-0.6	-0.7
Alt 2 Change	-0.8	-0.4	0.2	0.0	0.0	0.2	0.1	0.0	0.1	-0.2	-0.4	-0.3
Alt 3 Change	-0.1	-0.1	-0.1	0.2	0.0	0.2	0.1	0.0	0.0	-0.3	-0.5	-0.3
<b>Wet Years</b>												
Baseline (TAF)	77.7	78.9	74.9	57.6	54.8	55.5	56.8	59.3	65.4	73.6	80.9	77.9
Alt 1A Change	-0.3	0.1	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	-0.3	-0.5
Alt 1B Change	-0.3	0.2	0.3	0.2	0.0	0.0	0.0	-0.1	0.0	0.0	-0.3	-0.5

<b>Alt 2 Change</b>	0.8	0.8	0.6	0.0	0.0	0.1	0.0	0.0	0.1	0.1	-0.1	0.2
<b>Alt 3 Change</b>	-0.2	0.2	0.3	0.1	0.0	0.0	0.1	0.0	0.0	0.0	-0.3	-0.4

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Cheers, Nicole

**NICOLE L. WILLIAMS**  
Managing Director  
ICF  
o 916.231.9614  
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**From:** Laurie Warner Herson <[laurie.warner.herson@phenixenv.com](mailto:laurie.warner.herson@phenixenv.com)>  
**Sent:** Wednesday, June 22, 2022 4:20 PM  
**To:** Williams, Nicole <[Nicole.Williams@icf.com](mailto:Nicole.Williams@icf.com)>  
**Subject:** Re: SPJPA Sites: Alternative 2 Memo

Hi Nicole,

Confirming that you received this and whether. You and Anne have any concerns about being able to address Alt 2 without further modeling.

Thanks,

Laurie

On Jun 22, 2022, at 8:27 AM, Laurie Warner Herson <[laurie.warner.herson@phenixenv.com](mailto:laurie.warner.herson@phenixenv.com)> wrote:

Steve's response is below

Sent from my iPhone

Begin forwarded message:

**From:** "Micko, Steve/SAC" <[Steve.Micko@jacobs.com](mailto:Steve.Micko@jacobs.com)>  
**Date:** June 22, 2022 at 8:09:47 AM PDT  
**To:** Laurie Warner Herson <[laurie.warner.herson@phenixenv.com](mailto:laurie.warner.herson@phenixenv.com)>, "Heydinger, Erin" <[erin.heydinger@hdrinc.com](mailto:erin.heydinger@hdrinc.com)>  
**Subject:** RE: SPJPA Sites: Alternative 2 Memo

Yes, a similar table, with ALT1A, ALT1B, ALT2 and ALT3 was provided via email on May 19, 2022. It is also posted to the SharePoint.

Best,  
Steve

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**From:** Haywood, Laynee [Laynee.Haywood@hdrinc.com]  
**Sent:** 7/7/2022 8:52:50 AM  
**To:** Sandra Yarbrough [syarbrough@sitesproject.org]  
**Subject:** May Special Board Meeting Agenda for SharePoint  
**Attachments:** 0-Authority-Special\_Agenda-2018May07vA.pdf; 03-1-Authority\_Staff-Report\_Prop-1-WSIP2018May07vA.pdf

# SITES JOINT POWERS AUTHORITY

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JEFF HARRIS, CITY OF SACRAMENTO/SACRAMENTO COUNTY WATER AGENCY  
DON BADER, U.S BUREAU OF RECLAMATION – COST SHARE PARTNER **(NON-VOTING)**  
ROB COOKE, CALIFORNIA DEPARTMENT OF WATER RESOURCES – EX-OFFICIO MEMBER **(NON-VOTING)**

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## May 7, 2018 Sites Project Authority Special Board Meeting Agenda 9:00 a.m.

Board Member(s) will be participating by phone from the following location(s):

**Sacramento City Hall**  
Council Member Jeff Harris's Office (District 3)  
915 I Street  
Sacramento, CA 95814

Welcome to a meeting of the Sites Joint Powers Authority. If you are scheduled to address the Board, please state your full name for the record. Regularly numbered items may be considered at any time during the meeting. All items are listed in accordance with the Ralph M. Brown Act. We invite all members of the public to attend.

9:00 a.m. CALL TO ORDER:

- Pledge of Allegiance
- Introductions

1. CLOSED SESSION

Conference with legal counsel regarding significant exposure to litigation or adjudicatory proceedings (Govt. Code 54956.9(d)(2) and (4)(1 item).

2. REPORT FROM CLOSED SESSION

3. MANAGER'S REPORT

3.1 Report on status of Proposition 1 (WSIP) application

Discussion and possible direction to staff regarding the Water Commission's actions related to the Authority's application (**Attachment 3-1**).

**ADJOURN**

PERIOD OF PUBLIC COMMENT: Any person may speak about any subject of concern, provided it is within the jurisdiction of the Directors and is not already on today's agenda. The total amount of time allotted for receiving such public communication shall be limited to a total of 15 minutes per issue and each individual or group will be limited to no more than 5 minutes each within the 15 minutes allocated per issue. **Note:** *No action shall be taken on comments made under this comment period.*

ADA COMPLIANCE: Upon request, Agendas will be made available in alternative formats to accommodate persons with disabilities. In addition, any person with a disability who requires a modification or accommodation to participate or attend this meeting may request necessary accommodation. Please make your request to the County Board Clerk, specifying your disability, the format in which you would like to receive this Agenda, and any other accommodation required no later than 24 hours prior to the start of the meeting.

All supporting documentation is available for public inspection and review in the Office of the Clerk of the Board located at 122 Old Highway 99, Maxwell, CA 95955 during regular business hours 8:30 a.m. to 5:00 p.m., Monday through Friday.



Topic: **Authority Board Agenda Item 3-1** **2018 May 07**

Subject: **Proposition 1 WSIP application**

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**Requested Action:**

Consider staff’s recommendation to reduce the funding request from \$1,388. million as presented in the Authority’s February 23, 2018 appeal letter to the Water Commission to a lesser amount as determined by the Authority Board.

**Detailed Description/Background:**

On May 3, 2018, the Water Commission voted to accept the following valuation of benefits (dollars in millions and in 2015 dollars) and agreed to allow applicants until the close of business on May 9, 2018 to elect to change their funding request.

▪ Recreational benefits	\$	197.2
▪ Flood reduction benefits	\$	44.6
▪ Water to benefit Delta smelt in Cache Slough:	\$	333.5
▪ Water to benefit refuges by augmenting Level 4 water	\$	432.9
▪ Water to benefit Sacramento River anadromous fish	\$	0
▪ Water for Oroville coldwater pool benefits	\$	0
<b>Total value of eligible benefits</b>	<b>\$</b>	<b>1,008.2</b>
<b>Current funding request:</b>	<b>\$</b>	<b>1,388.0</b>
This results in a Public Benefit Ratio (PBR) of:		<b>0.73</b>

**Prior Authority Board Action:**

2017, July 31 Submit Application by the August 14, 2017 deadline

**Fiscal Impact/Funding Source:**

None.

**Staff Contact:**

Jim Watson

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Status:	Draft, subject to change	Prepared:	Watson	Phase:	1	Version:	0
Purpose:	Authority Board Staff Report	Checked:	Spesert	Date:	2018 May 03		
Caveat:	Informational	QA/QC:		Ref/File #:	12.221-210.018		
Notes:				Page:	1	of	2

**Attachments:**

- 3-1A WSIP scoring process & timeline
- 3-1B 2018 April 20 Letter from Water Commission to Authority: Response to Appeal
- 3-1C 2018 April 30 Letter from Feinstein & Garamendi: Water Commission's process and level of eligible funding to benefit central valley salmon
- 3-1D 2018 May 02 Letter from Authority to Water Commission: Proposed solution to the PBR discussion regarding the Sites Project

Summary of Commission Determinations for Public Benefit Ratios  
As of May 3, 2018

Project	Applicant	Type of Project	Total Cost	Funding Requested	Staff Recommended Eligible Amount	Commission Approved Eligible Amount	Commission PBR
Centennial Water Supply Project	Nevada Irrigation District	Surface Storage	\$324 M	-	\$0	Deemed ineligible	-
Chino Basin Conjunctive Use Environmental Water Storage/Exchange Program	Inland Empire Utilities Agency	Conjunctive Use	\$480 M	\$300 M	\$153.7 M	\$206.9 M	1.23
Kern Fan Groundwater Storage Project	Irvine Ranch Water District/Rosedale-Rio Bravo Water Storage District	Groundwater Storage	\$171 M	\$85.7 M	\$72.5 M	\$85.7 M	1.05
Los Vaqueros Reservoir Expansion Project	Contra Costa Water District	Surface Storage	\$795 M	\$459 M	\$422.6 M	\$459 M	1.81
Pacheco Reservoir Expansion Project	Santa Clara Valley Water District	Surface Storage	\$969 M	\$484.5 M	\$484.5 M	\$484.5 M	2.02
Pure Water San Diego Program North City Phase 1	City of San Diego - Public Utilities Department	Surface Storage	\$1,210 M	\$219.3 M	\$0	Deemed ineligible	-
Sites Project	Sites Project Authority	Surface Storage	\$5,176 M	\$1,388 M	\$933.3 M	\$1,008.3 M	0.73
South Sacramento County Agriculture & Habitat Lands Recycled Water, Groundwater Storage, and Conjunctive Use Program (South County Ag Program)	Sacramento Regional County Sanitation District (Regional San)	Conjunctive Use	\$373 M	\$280.5 M	\$244.3 M	\$280.5 M	1.05
Temperance Flat Reservoir Project	San Joaquin Valley Water Infrastructure Authority	Surface Storage	\$2,661 M	\$1,055.3 M	\$171.3 M	\$171.3 M	0.47
The Tulare Lake Storage and Floodwater Protection Project	Semitropic Water Storage District	Conjunctive Use	\$603 M	\$452 M	\$0	Deemed ineligible	-
Willow Springs Water Bank Conjunctive Use Project	Southern California Water Bank Authority	Conjunctive Use	\$343 M	\$301.6 M	\$105.3 M	\$123.3 M	0.41
<b>Total Requested Funding</b>				<b>\$5,097.9 M</b>	<b>\$2,587.5 M</b>	<b>\$2,819.5 M</b>	

**Total Cost** – Total cost as provided in the original application.

**Funding Requested** – \$ amount requested by applicants.

**Staff Recommended Eligible Amount** – Post-Appeal \$ amount staff estimated based on staff adjustments to benefits and value, per Proposition 1 requirements. (April 2018).

**Commission Approved Eligible Amount** – \$ amount Commission approved based benefits and value, per Proposition 1 requirements. (May 3, 2018)

**Staff Recommended PBR** – Ratio of value of public benefits divided by funding requested (April 20, 2018)

**Commission PBR** – Ratio of revised value of public benefits divided by funding requested (May 3, 2018). *Applicants can change their funding request by COB May 9.* PBRs will be finalized on May 10.

**CALIFORNIA WATER COMMISSION**

901 P STREET, P.O. BOX 942836  
SACRAMENTO, CA 94236-0001  
(916) 651-7501



**Armando Quintero**  
Chair

April 20, 2018

**Carol Baker**  
Vice-Chair

Jim Watson, General Manager  
Sites Project

**Andrew Ball**  
Member

[jwatson@sitesproject.org](mailto:jwatson@sitesproject.org)

**Joseph Byrne**  
Member

Subject: Public Benefit Ratio Appeal Response

**Daniel Curtin**  
Member

Dear Mr. Watson,

**Joe Del Bosque**  
Member

**Maria Herrera**  
Member

**Catherine Keig**  
Member

As you know, the Water Storage Investment Program (WSIP) provided an appeal process allowing applicants to respond to staff adjustments made in our February initial Public Benefit Ratio (PBR) review. Many applicants used the opportunity to submit information that helped substantiate their project's anticipated physical benefits and their monetary value to help the Commission make an informed determination of each project's PBR at the upcoming May 1-3 meeting.

Thank you for your engagement, and the work your team put into the appeal process. The enclosed packet includes the WSIP technical review team's response to your appeal regarding the PBR for the Sites Project.

The response includes the recommendations of the Department of Water Resources, Department of Fish and Wildlife, and State Water Resources Control Board, as appropriate, as well as the Commission staff's updated recommendation for the project's PBR.

The staff recommendations will be presented to the Commission at the May 1-3 meeting. Please note, we are reserving May 4 as a hold-over day in the event extra discussion time is necessary. At the Commission meeting, applicants will have the opportunity to publicly address the Commission and answer questions about their projects. Public comment also will be heard.

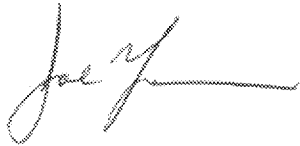
Staff from the Commission, the Department of Water Resources, the Department of Fish and Wildlife, and the State Water Resources Control Board look forward to engaging with applicants at the scheduled meetings on April 24 and 25. These public meetings are designed to walk through the staff-response and help identify any remaining issues that may need clarification when the Commission meets in May. The meetings also will help applicants and the public prepare for the May 1-3 meeting.

The California Water Action Plan recognizes the importance of investing in both above- and below-ground storage. The Commission's May 1-3 meeting will mark another key step toward making key investments in new water storage. The Commission remains on track to make early funding and conditional funding awards in July.

Jim Watson, General Manager  
Sites Project  
April 20, 2018  
Page 2

We look forward to your continued engagement in the Water Storage Investment Program.

Sincerely,

A handwritten signature in black ink, appearing to read "Joe Yun", with a long horizontal flourish extending to the right.

Joe Yun  
Executive Officer, California Water Commission

# Public Benefit Ratio Appeal Response: Sites Reservoir Project

Applicant: Sites Project Authority

## Introduction

On February 2, 2018, the California Water Commission (Commission) released staff-adjusted Public Benefit Ratios (PBRs) for Water Storage Investment Program (WSIP) applications received in August 2017. WSIP regulations section 6008 describes the appeal process for staff adjustments to a PBR. Applicants had three weeks to submit an appeal of the staff's adjustments to their PBRs. On February 23, 2018, the Commission received appeals from 10 applicants.

This PBR appeal response describes the following:

- Applicant's original PBR as submitted
- Staff adjustments to the PBR review
- Applicant's appeal
- Staff PBR recommendations

The Commission will decide final PBRs at its May 1-3, 2018 meeting.

This PBR response incorporates review of the applicant's appeal, which was conducted by the Commission's economics reviewers and water operations reviewers, the California Department of Fish and Wildlife (CDFW), and the California Department of Water Resources (DWR). The following reviews are attached to this PBR response:

- California Water Commission, Economics Review Appeal Response (Economics Response)
- California Water Commission, Water Operations Review Response to Applicant's Appeal of Public Benefits Ratio (Water Operations Response)
- California Department of Fish and Wildlife, Analysis of Water Storage Investment Program Project Appeals of Revised Public Benefit Ratios (CDFW Response)
- California Department of Water Resources, Water Storage Investment Program – Public Benefits Ratio Recommendations – Response to Applicant's Appeal (DWR Response)

## Project Overview

The Sites Project Authority is proposing a surface storage project, the Sites Reservoir Project. The Sites Reservoir Project would be a 1.81 million acre-foot offstream surface storage reservoir located in the Sacramento Valley west of the town of Maxwell. The proposed reservoir's conveyance facilities would include the use of existing Tehama Colusa Canal and Glenn-Colusa Irrigation District Canal diversion and conveyance facilities, plus a proposed new diversion and discharge pipeline. Sources of water would be Funks Creek and Stone Coral Creek, which would be impounded by the proposed reservoir and the Sacramento River. Operation of the proposed reservoir would be in cooperation with the operations of existing Central Valley Project (CVP) and State Water Project (SWP) system facilities. Detailed operating agreements would need to be developed that define a framework and procedures for cooperative operations among the Sites Project Authority, the CVP, and the SWP.

The applicant describes Sites Reservoir Project public benefits as follows:

- Ecosystem Improvement—Increase coldwater pool conservation in Trinity Lake, Shasta Lake, Lake Oroville, and Folsom Lake
- Ecosystem Improvement—Help regulate Sacramento River summer flows for best use of cold water for control of temperature conditions adverse to anadromous fish
- Ecosystem Improvement—Stabilize Sacramento River fall flows for improving spawning and rearing success of anadromous fish
- Ecosystem Improvement—Provide water to the Yolo Bypass to support salmon migration and summer food production for delta smelt
- Ecosystem Improvement—Provide water for Incremental Level 4 refuge deliveries per the Central Valley Project Improvement Act (CVPIA)
- Flood Control—Reduce the frequency of local flooding, including portions of Maxwell, Williams, and Colusa, reduce river levels to avoid flood events, and relieve pressure on local levees
- Recreation—Provide recreation through two new recreation areas and a boat ramp on the shore of Sites Reservoir

## Summary

Staff reviewed the information submitted in the appeal, considered the reasonableness of the documentation provided, and made recommendations (Table 1) for adjustment to the applicant's quantified public benefits, funding request or eligible amount, and PBR. Table 1 summarizes how these values changed during the PBR review process.

Through the PBR appeal process, applicants could rebut staff's adjustments to their public benefits, and provide an alternate PBR. If, during the appeal, and in response to a staff adjustment, the applicant chose to change their funding request from the amount in the original August 2017 application, it is also shown in Table 1.

<b>Table 1. Summary of Adjustments to Public Benefit Ratio</b>				
<b>Item</b>	<b>Original Application, August 2017</b>	<b>Staff PBR Review, February 2, 2018</b>	<b>Applicant Appeal, February 23, 2018</b>	<b>Staff Recommendation, April 20, 2018</b>
Value of Public Benefits (\$ millions)	\$3,506.2	\$662.6	\$3,162.9	\$933.3
Applicant Funding Request (\$ millions)	\$1,661.7	--	\$1,388.0 <sup>1</sup>	--
Public Benefit Ratio	2.11	0.40	2.28 <sup>2</sup>	0.67
<p>Notes:</p> <p>All values are in 2015 dollars.</p> <p>PBR value is based on the applicant's funding request.</p> <p>Values are rounded to the nearest tenth of a million dollars for display purposes.</p> <p>Underlying calculations reflect the precision provided by the applicant.</p> <p><sup>1</sup> This is the applicant's revised funding request as provided in the appeal.</p> <p><sup>2</sup> Applicant submitted a PBR of 1.9 based on the original funding request. The PBR has been recalculated using the revised funding request as provided in the appeal.</p>				

Table 2 summarizes the changes made during the PBR review process to the public physical benefits claimed in the application, and the monetary value of those benefits. The last column shows the staff recommendation for each claimed physical benefit.

<b>Table 2. Summary of Physical Benefits and Economic Issues</b>				
<b>Benefits</b>	<b>Physical/ Monetary</b>	<b>Staff PBR Review, February 2, 2018</b>	<b>Applicant Appeal, February 23, 2018</b>	<b>Staff Recommendation, April 20, 2018</b>
Ecosystem— Anadromous Fish	Physical benefit	CDFW recommended removal	Appealed	Physical benefit removed. See CDFW Response Page 1.
	Monetary value	Value adjusted	Appealed	Monetary value removed. See Economics Response Page 4.
Ecosystem— Refuge Water Supply	Physical benefit	No adjustments	N/A	Physical benefit accepted
	Monetary value	Value reduced	Appealed	Monetary value accepted. See Economics Response Page 2.
Ecosystem— Oroville Coldwater Pool	Physical benefit	CDFW recommended removal	Appealed	Physical benefit removed. See CDFW Response Page 3.
	Monetary value	Value reduced	Appealed	Monetary value removed. See Economics Response Page 7.
Ecosystem— Yolo Bypass Flows	Physical benefit	CDFW recommended removal	Appealed	Physical benefit accepted. See CDFW Response Page 4.
	Monetary value	Method accepted	N/A	Monetary value accepted
Recreation	Physical benefit	No adjustments	N/A	Physical benefit accepted
	Monetary value	Value increased	Accepted	Monetary value accepted
Flood Control	Physical benefit	Adjusted by DWR	Accepted	Physical benefit accepted. See DWR Response Page 2.
	Monetary value	Value reduced	Accepted	Monetary value accepted
Note: N/A indicates item is not applicable				

Table 3 summarizes the monetary value of the public benefits claimed by the applicants, as adjusted through the PBR review. It shows the staff recommendation, and how the total value of the claimed benefits changed through the PBR review. If a benefit was removed, the staff recommended monetary value is zero.

<b>Table 3. Monetization of Public Benefits (\$ millions)</b>				
<b>Benefits</b>	<b>Original Application, August 2017</b>	<b>Staff PBR Review, February 2, 2018</b>	<b>Applicant Appeal, February 23, 2018</b>	<b>Staff Recommendation, April 20, 2018</b>
Ecosystem— Anadromous Fish	\$1,637.1	\$0.0	\$1,616.4	\$0.0
Ecosystem— Refuge Water Supply	\$675.4	\$420.8	\$448.1	\$432.3
Ecosystem— Oroville Coldwater Pool	\$595.3	\$0.0	\$597.4	\$0.0
Ecosystem— Yolo Bypass Flows	\$268.5	\$0.0	\$259.2	\$259.2
Recreation	\$191.6	\$197.2	\$197.2	\$197.2
Flood Control	\$138.3	\$44.6	\$44.6	\$44.6
<b>Total Value of Public Benefits</b>	<b>\$3,506.2</b>	<b>\$662.6</b>	<b>\$3,162.9</b>	<b>\$933.3</b>
Notes: All values are in 2015 dollars. Values are rounded to the nearest tenth of a million dollars for display purposes. Numbers may not add up totals shown due to independent rounding and precision provided by applicant. Underlying calculations reflect the precision provided by the applicant.				

Table 4 shows staff recommendations for the total value of public benefits, ecosystem benefits, and the eligible amount. It also shows the proposed project’s capital costs, and the funding request by the applicant, as provided in the appeal. Adjustments to the value of public benefits may have resulted in changes to the eligible amount, because Water Code section 79752 specifies that projects must have a measurable benefit to the Delta ecosystem or tributaries to the Delta. Water Code section 79756 also specifies that the WSIP can fund no more than one-half of total project costs, and that ecosystem benefits must be at least 50 percent of the eligible amount.

<b>Table 4. Staff Recommendations for Value of Total Public and Ecosystem Benefits and Eligible Amount (\$ millions)</b>	
<b>Benefit/Cost</b>	<b>Amount</b>
Total Public Benefits	\$933.3
Ecosystem Benefits	\$691.5
Total Capital Costs	\$4,397.1
Total Funding Request as provided in appeal	\$1,388.0
Maximum Eligible Amount	\$933.3
Notes: All values are in 2015 dollars. Values are rounded to the nearest tenth of a million dollars for display purposes. Underlying calculations reflect the precision provided by the applicant.	

# Economics Review Appeal Response: Sites Reservoir Project

## Applicant: Sites Project Authority

This appeal response provides the Economic reviewers' (reviewers) recommendation for economics related public benefit ratio (PBR) review comments that were appealed by the applicant. The applicant appeal is summarized in this document and the reviewer responses are presented. Related comments are grouped by topic, in the order presented in the initial PBR review. For each PBR comment, a summary of the PBR comment is presented, followed by a synopsis of applicant's appeal, concluding with the reviewer response. Reviewers analyzed and considered the information contained in the appeal.

## Summary of Economics Appeal Response

The applicant appeals the following benefit and cost adjustments made in the Economics Review for PBR:

- The applicant removed a cost of \$185 per acre-foot (AF), and added conveyance energy cost for refuge water deliveries, and provided refuge water supply physical benefits by water year type. Applicant's appeal states a quantified benefit of \$448.1 million for refuge water supply. Reviewers adjusted the present value (PV) of refuge water supply benefit to \$432.3 million because the applicant's PV calculations used to obtain the \$448.1 million were not provided.
- The anadromous fish physical benefit was not substantiated; therefore, the benefit is assigned a monetary value of \$0. Reviewers accepted the alternative cost of rice land retirement and included the additional management and mitigation costs identified by the applicant, with some adjustments. The applicant's appeal states a quantified benefit of \$1,476.3 million for anadromous fish. If the physical benefit were substantiated, reviewers calculated the monetary value of the benefit would be \$307.6 million.
- The Oroville coldwater pool physical benefit was not substantiated; therefore, the benefit is assigned a monetary value of \$0. The applicant's appeal states a quantified benefit of \$597.4 million. Reviewers removed the Oroville coldwater pool monetary benefit because the water quantities provided to estimate alternative cost are not documented and no other alternative cost was provided; the reviewer adjusted monetary value of the benefit is also \$0.
- The applicant substantiated Yolo Bypass Flow physical benefits. Reviewers accepted the applicant's quantified benefit of \$259.2 million for this benefit.
- The applicant accepted reviewers' adjustments to flood control monetization. The adjusted PV of flood control benefits is \$44.6 million.

- The applicant accepted reviewers' adjustments to recreation monetization. The adjusted PV of recreation benefits is \$197.2 million.
- The applicant provided municipal and industrial (M&I) and agricultural water supply benefits. The reviewers confirmed the applicant's PV of M&I water supply of \$3,120 million. The applicant accepted reviewer adjustment of agricultural water supply benefit. The PV of the agricultural water supply benefit is \$1,407.9 million.
- The applicant agreed with PBR adjustments related to monetized hydropower benefits. The reviewer-adjusted PV of hydropower is \$569.5 million.
- The applicant removed recaptured water supply from the estimation of monetized benefits.
- The applicant removed the anticipated savings resulting from reduced interest during construction from the project cost allocation and requested inclusion of \$350 million in future mitigation to eligible capital costs. Reviewers retained \$4,397.1 million as the project's capital costs, as shown in the original application.

After considering all applicant appeals and reviewer adjustments in response, total public benefits are \$933.3 million, and the recommended eligible amount is \$933.3 million.

## 1. Ecosystem Monetization—Refuge Water Supply

Applicant's appeal states quantified benefit of \$448.1 million. Reviewers adjusted the benefit to \$432.3 million.

### 1.1. Comment—Average Conveyance Energy Cost

Reviewers concluded that the applicant's "Average Conveyance Energy Cost" of \$185 per AF cannot be added to the TR unit values to obtain "Adjusted WSIP Unit Water Values" as provided in Table A5-7 in the file named "Sites\_A5 Documentation.docx."

#### 1.1.1 Applicant Appeal

*The Authority removed the \$185 per AF added conveyance energy cost for refuge water deliveries that would be offset by an equivalent conveyance cost to deliver the water to the destination per the applicant's appeal letter, a file named "AppealLetter.pdf," on page 9.*

#### 1.1.1 Economics Review Response

Reviewers acknowledge applicant's acceptance of removal of the \$185 per AF added conveyance energy cost.

### 1.2. Comment—Reliability of Water Supplies

The applicant's valuation of refuge water supplies does not account for the reliability of these supplies. Based on information in Tables A5-17 in the file named "Sites\_A5 Documentation.docx," the applicant calculates refuge water supply using the same unit values for each future development condition (i.e.,

2030, 2045, and 2070) regardless of the different amount of water provided in different water year types.

#### 1.2.1 Applicant Appeal

*The refuge water valuation was revised to reflect specific water deliveries across water year types. Additional details regarding the revised analysis are provided in Attachment B per the file named AppealLetter.pdf,” on page 9.*

#### 1.2.1 Economics Review Response

The water operations review concluded that “The revised Incremental Level 4 water supply deliveries included in Table 5 of the Appeal Letter and Table B-2 of AttachB match the results of analysis conducted by reviewers” (see Water Operations Response, page 9 of 12). Therefore, benefits were monetized based on these quantities, see Comment 1.4 below.

### 1.3. Comment—Conveyance Cost for Refuge Supplies

Reviewers used these adjusted quantities with water year type frequencies and TR unit values, plus the additional \$21 per AF conveyance cost, to adjust the benefits for refuge water supply.

#### 1.3.1 Applicant Appeal

*The Authority added a \$21 per AF cost for the conveyance energy cost to the unit water benefit values from the TR to obtain the willingness-to-pay at the point of use per the file named “AppealLetter.pdf,” on page 9).*

#### 1.3.1 Economics Review Response

Reviewers accept this addition.

### 1.4. Comment—Present Value Calculation

The reviewer-adjusted PV of refuge water supply benefits is \$432.3 million.

#### 1.4.1 Applicant Appeal

*The applicant states that the “project’s refuge water supply benefits will have a total present value of \$448.1 million with an equivalent annualized average value of \$15.8 million” per the file named “AttachB.pdf,” on page B-5.*

#### 1.4.1 Economics Review Response

Reviewers are unable to replicate the PV calculation of \$448.1 million using the information provided. Using time series estimates of annual value in the appeal spreadsheet named “Final Sites WSIP Appeal Clean Model 2018.02.23.xls” on the “Annual Benefit by Purpose Rev” tab, the reviewers estimate the PV of benefits to be \$432.9 million. The reviewers’ analysis using refuge water supply quantities by water year type provided by the applicant results in a revised refuge water supply benefit of \$432.3 million. Reviewers accepted the adjusted monetized benefit of \$432.3 million because the applicant’s calculations are not provided and could not be verified.

## 2. Ecosystem Monetization—Anadromous Fish

Applicant's appeal states a quantified benefit of \$1,476.3 million. The physical benefit was not substantiated (see the California Department of Fish and Wildlife (CDFW) Response, page 3 of 5). Therefore, the monetary benefit for anadromous fish is zero. If the physical benefit were not removed, the monetary value of the benefit would be \$307.6 million.

### 2.1. Comment—Document Least-Cost Alternative

Reviewers found that the applicant did not provide sufficient documentation, as required by the regulations section 6004(a)(4), to support the conclusion that the 12.5-foot raise of Shasta Dam is the most cost-effective alternative.

#### 2.1.1 Applicant Appeal

*The applicant provides some additional documentation that the 12.5-foot raise of Shasta Dam is the most cost-effective alternative. Colusa Reservoir complex and Newville Reservoir are presented. However, the applicant states that "Other than constructing a new off-stream reservoir, the most effective way to achieve the anadromous fish benefits in the same location as Sites Reservoir (Sacramento River between Keswick Dam and Red Bluff) is to raise Shasta Dam," per the file named "AttachA.pdf," on page A-77.*

#### 2.1.1 Economics Review Response

Reviewers noted that the additional information and analysis are not used by the applicant or reviewers to monetize benefits.

### 2.2. Comment—Monetizing Anadromous Fish Benefit Based on Alternative Cost of Water

The applicant does provide alternative benefits measures based on the amount of water, but the applicant did not demonstrate that the Shasta Dam raise is more feasible than the additional amount of water transfers.

#### 2.2.1 Applicant Appeal

*The applicant states "The next section considers a long-term water transfer program as an alternative non-construction approach," per the file named "AttachA.pdf," on page A-78.*

#### 2.2.1 Economics Review Response

Reviewers noted that the additional information and analysis are used to develop an alternative cost to monetize the anadromous fish benefits.

### 2.3. Comment—Conditions for Use of TR Unit Values

To apply the TR water unit values, water quantities by water year type, as well as confirmation that these quantities would provide the same fishery improvement as the project, would both be required.

### 2.3.1 Applicant Appeal

*The applicant states that “Table A.4-4 provides Anadromous Fish Benefit Water Supply Quantities by Water Year Type and monetization is provided based on Delta TR unit values plus additional costs of rice land retirement.” The appeal first calculates the alternative cost of the Table A.4-4 water using Delta Export TR unit values to obtain a PV of benefits of \$1,337.5 million per the file named “AttachA.pdf,” on page A-79.*

### 2.3.1 Economics Review Response

Reviewers could not confirm that the Delta export amounts shown in Table A.4-4 provide the same benefits to anadromous fish as the proposed project. The applicant did not provide an explanation on how the Table A.4-4 volumes were derived and did not provide any analysis demonstrating that these Delta export amounts provide the same benefits to anadromous fish as the proposed project.

The applicant’s appeal finds that north of Delta rice land would need to be used to provide water. Water transfers for Sacramento Valley uses have typically come from Sacramento Valley water users. Therefore, reviewers concluded that north-of-delta water amounts and monetization, not south-of-Delta, should be applied. Reviewers did not accept the monetization as presented in the appeal.

### 2.3.2 Applicant Appeal

*The appeal also finds that rice land retirement would be required to achieve the project’s physical benefits. The applicant states: “The Economics Review by the CWC recommended the use of WSIP unit values to monetize the benefits. This would require the establishment of a long-term transfer program to conserve water in Lake Shasta to mimic the coldwater pool benefits from Sites Reservoir operations” per the file named “AppealLetter.pdf,” on page 9.*

*In their description of the analysis, the applicant states: “Unlike the short-term water sales contracts within the WSIP’s transfer data, permanent land retirement will be required for the long-term water transfer agreements necessary to match the Sites Reservoir’s water supply reliability. It is also expected that outright land purchases rather than easements would be necessary, given the typical land and operating conditions for region’s rice production. The cropland would be expected to remain permanently fallow—even in wet years” per the file named “AttachA.pdf,” on page A-82.*

*Section 1b on page A-82 to A-83 of the file named “AttachA.pdf” documents “Rice Cropland Retirement Acreage.” Having calculated that 22,410 acres of rice land retirement would be required, Section 2c of AttachA.pdf states: “The estimated acquisition costs for the 22,410 acres are conservatively estimated to be between \$124.4 million (agricultural easement) and \$207.3 million (for full fee title).”*

*The applicant calculated additional costs associated with rice land retirement management and giant garter snake and wetland mitigation. Those costs were then added to the Delta Export alternative cost.*

*The applicant's appeal states: "Outright purchase of farmland represents an additional cost over temporary transfers or easements... As a result, a 1.67 factor (i.e. 1/0.6 or 67 percent increase in the transfer cost/value) may be applied to provide an approximate value adjustment for water transfers requiring full fee-title property acquisitions" per the file named "AttachA.pdf," on page A-82. The appeal then reduces benefits 1.4 percent for "downstream flow impacts" to obtain a proposed total benefit of \$1,476.3 million (in the same file on page A-92).*

### 2.3.2 Economics Review Response

Reviewers accepted the concept that one alternative means of providing the project anadromous fish benefit would include rice land retirement. However, reviewers could not replicate the \$124.4 million to \$207.3 million cost estimate generated by the applicant. Reviewers calculated the total land acquisition high-end cost to equal \$224.1 million (i.e., \$10,000 per acre times 22,410 acres).

Reviewers accepted most of the additional costs associated with rice land retirement management and wetland and giant garter snake mitigation shown in Table A.4-9 since the TR unit values do not include management and mitigation costs that would likely be required to achieve the same physical benefit using rice land retirement.

Reviewers did not accept the applicant's "Acquisition (Net)" cost of \$22.50 per AF. The applicant provides reasoning for the "Acquisition (Net)" on page A-82, under section "a. Land Costs." The applicant also states that the cost of short-term easements is between 60 and 80 percent of the full fee title value of the land. They calculate a factor of 1.67 (1/0.6) and state that this represents the additional cost of permanent land retirement. For the same volume of water, the cost of temporary transfers is, generally, not less, when compared to land retirement. This is because land retirement allows growers to avoid more fixed farming costs than temporary transfers.

Reviewers accepted the alternative cost of land retirement and all additional costs identified by the applicant except the "Acquisition (Net)" cost of \$22.0/AF" discussed above. The additional management and mitigation cost for each of 22,410 retired acres is \$134.70. The PV of these costs is \$83.5 million. The total PV of the anadromous fish benefit then equals \$307.6 million based on the land retirement alternative (i.e., \$224.1 million plus \$83.5 million). Since the physical benefit is not accepted the assigned monetized benefit value is \$0.

### 2.3.3 Applicant Appeal

*Table A.4-13 in the file named "AttachA.pdf," on page A-91 provides "Relative Change in Lower River Average Annual Survival" and in the same file on Table A.4-14, "the benefit values have been conservatively reduced by 1.4 percent to account for downstream flow impacts on anadromous fish populations."*

### 2.3.3 Economics Review Response

It is not clear that this adjustment (i.e., 1.4 percent) can approximate an appropriate reduction in benefits due to downstream flow impacts. This might be appropriate if the values in Table A.4-13 are the reduction in survival as a share of the increase in survival of anadromous

fish provided by the project. Tables A.1-2 through A.1-5 in the file named “AttachA.pdf,” on pages A-3 to A-5 show that this is not the case. The 1.4 percent is large relative to the increase in survival in Table A.1-5. Therefore, this potential adjustment was not accepted.

## 2.4. Comment—Monetizing Anadromous Fish Using Willingness to Pay

Reviewers noted the applicant has estimated anadromous fish numbers using SALMOD.

Regulation section 6004(a)(4)G requires that:

*“The monetized benefit of the proposed project shall be calculated as the avoided cost (if any) plus, for any portion of the physical benefit not monetized as an avoided cost, the minimum of the feasible alternative cost value (if any) and the willingness to pay value (if any).”*

If the applicant’s fish numbers were accepted, a willingness-to-pay measure should be developed as required by the TR.

### 2.4.1 Applicant Appeal

*In the applicant’s file named “AttachA.pdf,” on page A-2, Table A.1-1 provides “Total Number of Returning Adults Assumed in SALMOD for the Four Chinook Salmon Runs.” Table A.1-5 in the same file provides “Annual Production Results from SALMOD Adjusted for Reduced Flows Downstream of Sites Reservoir Diversions.” Additionally, Table A.17 in the same file provides “Long-term Average Escapement for Winter-Run Chinook Salmon (1971-2002).” This last table provides estimates of “Increment under With Sites Scenario with Flow-Survival Adjustment” showing increased winter-run Chinook salmon escapement of 58 and 228 adults under 2030 and 2070 conditions respectively.*

### 2.4.1 Economics Review Response

CDFW did not substantiate the anadromous fish benefit (see CDFW Response, page 3 of 5). If the physical benefit of fish numbers could be accepted, then the willingness-to-pay benefit could be compared to alternative cost. Using unit fish values provided in the TR, reviewers found that the alternative cost measure based on rice land retirement was less than the value of fish produced. However, this monetization cannot be accepted as a potential monetization measure.

## 3. Ecosystem Monetization—Oroville Coldwater Pool

The applicant’s appeal states a quantified benefit of \$597.4 million. The physical benefit was not substantiated (see CDFW Response, page 4 of 5). Therefore, the monetary benefit for the Oroville coldwater pool benefit is zero. If the physical benefit were not removed, the monetary value of the benefit would still be \$0.

### 3.1. Comment—Alternative Cost of Water Supplies Based on Annual Oroville Storage

Reviewers adjusted the monetization of the Lake Oroville coldwater pool physical benefit. Lake Oroville physical benefits are provided only as “projected future increase in annual water storage.”

#### 3.1.1 Applicant Appeal

*The applicant provides coldwater pool supply physical benefits by water year type in the file named “AttachC.pdf” in Table C2-2.*

#### 3.1.1 Economics Review Response

Reviewers were unable to substantiate that these water quantities would provide the same coldwater pool improvement as the project. The applicant did not provide an explanation on how the Delta export quantities in Table C2-2 were derived and did not provide any analysis demonstrating that these Delta export amounts provide the same coldwater pool benefit as the proposed project. Therefore, monetization using the Table C2-2 water quantities was not accepted.

### 3.2. Comment—Use of TR Water Unit Values

Reviewers recommend adjusting the monetization applied to the Lake Oroville coldwater pool benefit based on the alternative cost of water supply using TR unit values.

#### 3.2.1 Applicant Appeal

*The applicant provided substantial new analysis for Oroville coldwater pool benefits. Alternative cost is based on the amount of reduced Delta export by water year required to achieve the same physical benefit. For monetization, the applicant states “The Authority recommends retaining the water unit values for Delta export because it would be more straightforward for State Water Project water users to reduce water use south of the Delta to conserve water in Oroville... Lake Oroville provides water almost exclusively for south of Delta water contractors” per the file named “AttachC.pdf,” on page C-10.*

#### 3.2.1 Economics Review Response

Lake Oroville also releases water for Feather River water rights holders. The California Department of Resources’ (DWR’s) Bulletin 132-15, *Management of the State Water Project*,<sup>1</sup> documents that, from 2002 to 2014, Feather River diversions ranged from 0.84 to 1.19 million AF. These water users could participate in water transfers to provide the same coldwater pool benefit as the Sites project. Therefore, reviewers conclude that north-of-Delta water quantities and TR north of Delta unit values should be used.

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<sup>1</sup> <https://www.water.ca.gov/LegacyFiles/swpao/docs/bulletins/bulletin132/Bulletin132-15.pdf>

## 4. Ecosystem Monetization—Yolo Bypass Flows

Reviewers accepted the applicant’s monetization of Yolo Bypass flow physical benefits. This physical benefit has been substantiated by the applicant and accepted by CDFW (see CDFW Response, page 4 of 5). The PV of benefits is \$259.2 million.

## 5. Flood Control Monetization

The applicant accepts quantified benefit of \$44.6 million provided in the PBR review.

### 5.1. Comment—Monetization of Flood Control Physical Benefit

Reviewers adjusted monetization of the flood control physical benefit. In addition to the assumed 5-foot flood depths for all flood events, reviewers have concerns about the use of full structure replacement values, and misapplication of U.S. Army Corps of Engineers depth-damage functions.

#### 5.1.1 Applicant Appeal

*The applicant states “The Authority accepts the reviewer’s comments related to both the physical benefits and the monetized benefits” in the file named “AppealLetter.pdf,” on page 13.*

#### 5.1.1 Economics Review Response

Reviewers acknowledge the applicant’s acceptance of flood control monetization adjustments.

## 6. Recreation Monetization

The applicant’s appeal states a quantified benefit of \$197.2 million. Reviewers accept this benefit.

### 6.1. Comment—Monetization of Recreation Physical Benefits

Reviewers accepted monetization of recreation physical benefits. The small difference between the applicant’s (\$191.6 million) and reviewer-adjusted (\$197.2 million) in PV of recreation benefits in Table 1 is caused by different phasing-in of benefits after the start of project operations.

#### 6.1.1 Applicant Appeal

*The applicant states that “The Authority accepts the reviewer’s comments related to both the physical benefits and the monetized benefits” in the file named “AppealLetter.pdf,” on page 13.*

#### 6.1.1 Economics Review Response

Reviewers acknowledge the applicant’s acceptance of recreation monetization.

## 7. Non-Public Benefits Monetization—Municipal and Industrial and Agricultural Water Supply

The applicant’s appeal states a quantified benefit of \$4,528 million. Reviewers accept this benefit.

## 7.1. Comment—Monetization of Supply

Reviewers accepted the monetization of the M&I water supply benefits and adjusted monetization of agricultural water supply benefits.

### 7.1.1 Applicant Appeal

*The applicant states that “The agricultural water supply benefits were updated consistent with the reviewer’s comments on conveyance costs” in the file named “AppealLetter.pdf,” on page 19.*

### 7.1.1 Economics Review Response

Reviewers accept the applicant’s calculation of agricultural water supply benefits.

## 8. Non-Public Benefits Monetization—Recaptured Water Supply

### 8.1. Comment—Recaptured Water Supply Benefit

Water operations reviewers were not able to verify the recaptured water supply benefit (see Water Operations Review, attached). Therefore, reviewers recommend removing this physical benefit.

### 8.1.1 Applicant Appeal

*The applicant states that “For the purposes of completing the evaluation of monetized PBR, the Authority has removed the recaptured water supply from the estimation of monetized benefits” in the file named “AppealLetter.pdf,” on page 18.*

### 8.1.1 Economics Review Response

Reviewers acknowledge the applicant’s removal of recaptured water supply.

## 9. Non-Public Benefits Monetization—Hydropower

The applicant’s appeal states a quantified benefit of \$570.4 million. Reviewers accept this benefit with adjustments to PV calculations. The reviewer-adjusted PV of this benefit based on the original PBR review is \$569.5 million.

### 9.1. Comment—Hydropower Benefit Monetization Method

Reviewers accepted the monetization method for hydropower benefits with some adjustment to the PV calculations.

### 9.1.1 Applicant Appeal

*The applicant states that “The Authority accepts the reviewer’s comments related to both the physical benefits and the monetized benefits,” in the file named “AppealLetter.pdf,” on page 19.*

### 9.1.1 Economics Review Response

Reviewers acknowledge the applicant’s acceptance of hydropower benefits.

## 10. Project Costs Monetization—Interest During Construction

### 10.1. Comment—Federal and State Contributions

The applicant reduces interest during construction (IDC) on the assumption that federal and State contributions before operations would reduce interest costs. Reviewers adjusted Sites costs by removing the applicant’s IDC reduction.

#### 10.1.1 Applicant Appeal

*The applicant states that “The anticipated savings resulting from reduced interest during construction have been removed from the cost allocation,” in the file named “AppealLetter.pdf,” on page 19.*

#### 10.1.1 Economics Review Response

Reviewers acknowledge the applicant’s acceptance of removal of IDC cost savings.

## 11. Project Costs Monetization—Mitigation Costs

### 11.1. Comment—Project Costs

Reviewers did not comment on the project’s mitigation costs or adjust the project’s capital costs in the PBR review.

#### 11.1.1 Applicant Appeal

*The applicant’s appeal letter, page 2 states:*

*In Attachment F.2, Table 1 Economics Review, the mitigation costs were dropped from the eligible capital costs. Section 6001(a)(11)(C) explicitly allows “required environmental mitigation or compliance obligation expenses” as part of the capital cost. Also, per Page 8-1 of the Technical Reference document, environmental mitigation and compliance costs associated with providing public benefits can be included in the cost allocation. No explanation was provided to explain why these costs were excluded from the CWC cost allocation. In absence of any CWC comments indicating its basis for adjustment for the mitigation costs, the Authority contends that its full construction cost estimate of \$4,797 million should be recognized as the project’s WSIP eligible capital amount (per the file named “AppealLetter.pdf,” on page 2).*

#### 11.1.1 Economics Review Response

Reviewers note that the appeal comment draws attention to an inconsistency within the original application. Application listed \$4,397 million as the capital cost, which was used by the reviewers during the PBR evaluation; the mitigation or compliance obligations were, along with other costs, presented as separate costs, as shown in the applicant’s Physical and Economic Benefits Summary Table, Part 3. Source for applicant estimates is the file named “Sites\_A11 Physical and Economic Benefits Summary Tables”. Part 3 of the Physical and Economic Benefits Table is reproduced below.

<b>Part 3. Present Value of Project Costs, Cost-Effectiveness Measure, and Public Benefit Ratio, Million 2015 \$ Present Value</b>		
<b>Project Costs</b>	<b>Application Page Number</b>	<b>2015 \$ Million Present Value</b>
Capital costs as defined in Program regulations	A10-2	\$4,397
Interest during construction	A10-2	\$429
Replacement costs	A10-3	\$44
Future environmental mitigation or compliance obligation costs	A10-2	\$350
Operations, maintenance and repair (OM&R) costs	A10-3	\$711
Other costs (describe)	NA	\$0

Therefore, the mitigation costs were not “excluded” by the reviewers; rather, they were not explicitly included in the “Capital costs as defined in Program regulations” by the applicant.

# Water Operations Review Response to Applicant's Appeal on Public Benefits Ratio: Sites Project

## Applicant: Sites Project Authority

This response to appeal contains the Water Operations related Public Benefit Ratio review comments (released February 2, 2018), applicant appeal (received February 23) summarization, and Water Operations reviewer responses. The information is arranged as a comment group containing a specific reviewer comment, associated applicant appeal, and reviewer response. The comment groups are arranged by comment order as established in the February Public Benefit Ratio review. Through the information supplied with the appeal, the applicant has addressed Water Operations reviewer comments made in the Public Benefit Ratio review. This Water Operations response to Sites Project Authority's appeal is supplied to other review teams for their use in responding to applicant appeal items related to physical public benefits and economics.

## Comment 1: CalSim II Model Review

### Comment 1.1

Review of the Sites Project Authority's CalSim II model inputs shows that the water quality standards measured in milligrams per liter (mg/L) at Contra Costa Water District's (CCWD) intakes at Rock Slough, Old River, and Victoria Canal are different from the without-project models published by the Water Storage Investment Program (WSIP). It is unclear how the changes in the salinity standards affect the model results and the Sites Reservoir operations.

#### Applicant Appeal:

*A new project can modify water quality in the Delta that can affect downstream conditions.*

*CalSim II contains a CCWD module that has water quality operational objectives for each of the CCWD intakes. The applicant explained that the CalSim II model inputs for the water quality conditions at the existing CCWD intakes were modified based on DSM2 simulations provided for the with project (Sites Reservoir) conditions.*

*"The CalSim II model inputs for SWRCB D-1641 water quality standards at Contra Costa Water District's (CCWD) intakes at Rock Slough were not modified from the without-project models published by the WSIP.... In order for the CalSim II simulation to reflect the potential changes to existing CCWD/LV operations and determine the net effect of the With Project condition on CCWD, SWP and CVP exports and related water quality conditions, it is imperative that CalSim II simulations (for any with project or alternative condition) use updated DSM2 simulated results for these inputs. ... " (Appeal Letter, p.13)*

Water Operations Review Response:

The explanation provided by the applicant in the appeal adequately addresses the comment. Reviewers confirmed that the CalSim II model inputs for the water quality conditions at the existing CCWD intakes were modified based on DSM2 simulations for the with project conditions.

## Comment 1.2

The applicant proposed a bypass flow standard at four locations along the Sacramento River, including Red Bluff Diversion Dam, Hamilton City, Wilkins Slough, and Freeport. However, the applicant does not provide information on the process used to develop the bypass flow standard. As a result, reviewers are unable to identify whether the proposed standard is adequate to “maintain and protect existing downstream water uses and environmental resources.”

Applicant Appeal:

*The applicant provided additional supporting documentation and explained that the proposed minimum bypass flow criteria were selected to protect existing beneficial uses, water rights, and existing environmental regulatory standards while developing the potential benefits of the Sites Project.*

*“The proposed minimum bypass flow criteria were selected to protect existing beneficial uses, water rights and existing environmental regulatory standards while developing the potential benefits of the Sites Project... CalSim II is instructed that diversions to fill Sites are lower priority than any other existing use of water including the use of water for upstream/downstream diverters, Delta exports and Delta outflow and salinity regulatory requirements. ... To address this concern, iterative analysis was done with the CalSim II and DSM2 to assess potential changes to Delta salinity and to develop protective bypass flow criteria. Over many iterative simulations, a variable schedule of bypass flow criteria for the Sacramento River at Freeport was developed to minimize the potential effects.”  
(Appeal Letter, p. 4 and 5)*

Water Operations Review Response:

The additional information provided by the applicant in the appeal adequately addresses the comment. Reviewers confirmed that diversion to Sites Reservoir has a lower priority than existing water deliveries and regulatory requirements and that Delta salinity is approximately the same between the with- and without-project conditions. The weight for diversion into the Sites Reservoir, represented by arc C17601, is set to negative 1500 which is same as the weight on the surplus and excess flows in the system and lower compared to the weights on water deliveries and regulatory requirements.

## Comment 1.3

The applicant proposes a storm-induced pulse flow protection standard from October through May to “minimize entrainment and impingement of juvenile salmonids and other poor-

swimming aquatic species.” Reviewers cannot verify whether the standard is applied for an adequate duration from the pre-processed number of no diversion days timeseries inputted in the CalSim II model.

#### Applicant Appeal

*The applicant provided supplemental information regarding the basis for the proposed pulse flow protection operation to minimize entrainment and impingement of juvenile salmonids. The applicant described the iterative approach developed to estimate the number of no diversion days and restrict diversions in CalSim II during pulse flow periods for modeling purposes and provided the modeling approach justification of the number of days of no diversions to fill Sites Reservoir.*

*“Operations modeling of the Sites Project included restrictions on diversions to limit impacts on out-migrating juvenile fish as a “surrogate” for real time monitoring and adaptive management... The majority of diversions into Sites Reservoir occur during December through March. Of those months, 44% have no diversion days in recognition of potential pulse events over the 82-year simulation period. Approximately 200 potential pulse events are protected over the 82-year simulation period with durations with an average of 3.5 no diversion days with some months having as many as 14 no diversion days.” (Appeal Letter, p. 5)*

#### Water Operations Review Response:

The additional information provided by the applicant in the appeal adequately addresses the comment regarding the basis for pulse flow protection standard. A review of the 2030 and 2070 conditions confirms that, on average, approximately 85 percent of the water diverted into Sites Reservoir occurs between December and March, which coincides with the months with the highest probability of no-diversion days. A review of the no diversion day timeseries confirms the data presented by the applicant in Table D.3-1 of the appeal documentation. The applicant acknowledged that this approach was adopted for modeling purposes and that “... project operations will be informed by real-time monitoring of fish presence and movement” (AttachD, p. D-5).

#### Comment 1.4

The applicant proposes to “augment flows in the Sacramento River between Keswick Dam and Red Bluff Diversion Dam to minimize dewatering of fall-run Chinook salmon redds... from October through March, particularly during fall months.” Review of the applicant’s CalSim II model results show that the range on long-term average change in Sacramento River flows for the months between October and March between Keswick Dam and Bend Bridge varies by 0 to 5 percent under 2030 conditions, and by -5 to 3 percent under 2070 conditions; between Bend Bridge and Red Bluff Diversion Dam varies by -3 to 1 percent under 2030 conditions, and by -5 to -2 percent under 2070 conditions. These results suggest minimal or no flow augmentation to help minimize dewatering of salmon redds.

#### Applicant Appeal:

*The applicant pointed out that the Water Operations Review focused on the long-term average conditions between October and March without considering the intentional, primary benefits of providing additional water during the critical period for fall run Chinook salmon flow stability (December through February) when Shasta flows may be reduced.*

*“The use of a long-term monthly average flow during the longer October-March period obscures the challenges for flow stability for fall-run Chinook and the benefits of the Sites Project to this run... The Sites ecosystem enhancement storage account has been allocated to increase and stabilize flows in the Sacramento River below Keswick Dam to minimize dewatering of salmon redds.” (Appeal Letter, p. 6)*

*“The Operations Plan defined a general window of opportunity between September and March in Above Normal, Below Normal, and Dry years for water to be released from Shasta Lake to stabilize flows in the Sacramento River when flows are between 3,250 to 5,500 cfs. This window of opportunity defined in the Operations Plan was based on current conditions. The quantification of benefits is based on modeling results under WSIP 2030 and 2070 climate conditions, and modeling analyses indicate that under future climate conditions the primary benefits of this action occur between December and February.” (AttachD, p. D-10)*

#### Water Operations Review Response:

Reviewers revised the analysis of the Sacramento River flows below Keswick Dam by reducing the time window for the flow augmentation benefits from October through March to December through February, and focusing on the Below Normal, Dry, and Critical water years instead of the long-term averages. Reviewers confirmed there is flow increase in the Sacramento River below Keswick Dam between December and February in Below Normal, Dry, and Critical water years. The results of the analysis show that flows in the Sacramento River below Keswick Dam between December and February exceed the without-project condition 40 to 50 percent of the time under 2030 conditions and 25 to 40 percent of the time under 2070 conditions, resulting in increase in average December through February flow by 16 TAF (7 percent) and 14 TAF (6 percent), respectively. Under 2030 conditions, the average December through February flow increases by 10 TAF (4 percent), 29 TAF (12 percent), and 9 TAF (4 percent) for Below Normal, Dry, and Critical water years, respectively. Under 2070 conditions, the average monthly flow between December and February increases by 13TAF (4 percent), 14 TAF (6 percent), and 16 TAF (8 percent) for Below Normal, Dry, and Critical water years, respectively.

#### Comment 1.5

The applicant proposes to improve the coldwater pool storage in Lake Oroville to improve water temperature suitability for anadromous fish in the lower Feather River from May through November during all water years. Review of the applicant’s CalSim II model results show that

the range on long-term average change in the lower Feather River flow decreases by 1 to 7 percent from May through August, and increases by 1 to 3 percent from September through November under 2030 conditions; flow decreases by 1 to 11 percent from June through November with no change in September, and increases by 1 percent in May under 2070 conditions. These results suggest the flow augmentation objective in the lower Feather River is not fully met during May through November.

**Applicant Appeal:**

*The applicant pointed out that the Water Operations review is based on long-term average changes in Feather River flow which does not allow examination of benefits when they are needed most by salmonids and in wet and above normal water years, flow and water temperature management are generally not an issue on the Feather River.*

*“The commission review is based on long-term average changes in Feather River flow which don’t allow examination of benefits when they are needed most by salmonids. In wet and above normal water years flow and water temperature management are generally not an issue on the Feather River. Per the ... Operations Plan of the application, the most important water year types for stabilizing flows and river temperatures for salmonids are in dry and critical years with low Lake Oroville storage and a limited cold water pool. ... In general releases are reduced in June through August to preserve and maintain cold water pool, with flow augmentation releases in following months depending on storage conditions. Some periods may show decreases in average long-term river flows if more water is retained in reservoir storage.” (AttachD, p. D-19)*

**Water Operations Review Response:**

Reviewers revised the analysis of flows in the Feather River by reducing the time window for the flow augmentation benefits from May through November to May through September; focusing on the Dry and Critical water years instead of the long-term averages, and revising the definition of “lower Feather River” to be the stretch of the Feather River immediately below the Thermalito Complex instead of the Feather River just upstream of the confluence with the Sacramento River. Reviewers confirmed there is flow increase in the Feather River flows from May through September in Dry and Critical water years. Under 2030 conditions, the average May through September flow increases by 12 TAF (7 percent). The largest flow increases are observed during June and July where flows under the with-project conditions exceed the without-project conditions 60 to 80 percent of the time followed by May and September during which flows exceed the without-project conditions 40 to 50 percent of the time. No flow increases are observed in August; instead, 90 percent of the time flows are less than the without-project conditions. Under 2070 conditions, the average May through September flow increases by 5 TAF (3 percent). The largest flow increases are observed later in the summer during August and September where flows exceed the without-project conditions 50 to 60 percent of the time followed by May through July during which flows exceed the without-project conditions less than 40 percent of the time.

## Comment 2: HEC-5Q and CE-QUAL-W2 Model Review

The applicant states that the project would “increase cold-water pool storage in Shasta Lake, Lake Oroville, and Folsom Lake and improve temperature in the Sacramento and American Rivers during certain months at specific compliance points...” A review of the applicant’s HEC-5Q model results shows minimal water temperature reduction in the upper Sacramento River.

### Applicant Appeal:

*The applicant pointed out that the Water Operations Review focused on long-term average conditions while not addressing the intentional, primary water temperature benefits of the Sites Project in Dry and Critical year types.*

*“The review focused on long-term average conditions while not addressing the intentional, primary benefits of the Sites Project in dry and critical year types. Existing operations provide compliant conditions but have important challenges in dryer periods.” (Appeal Letter, p. 15)*

*The applicant provided supplemental water temperature results for the average July to September water temperature for long-term, Dry, and Critical years at the four important Sacramento River temperature locations (Bonnyview, Balls Ferry, Jellys Ferry, and Bend Bridge) for the 2015, 2030, and 2070 conditions. (AttachD, p. 23-25)*

### Water Operations Review Response:

The additional information provided by the applicant in the appeal adequately addresses the comment. Reviewers reviewed the supplemental HEC-5Q model data focusing on Dry and Critical years for the 2030 and 2070 conditions provided by the applicant in the appeal (Attachment D, p.23-25). Reviewers confirmed the long-term Dry and Critical years monthly average (July to September) temperature for the four Sacramento River temperature locations (i.e., Bonnyville, Balls Ferry, Jellys Ferry, and Bend Bridge) for the Current (2015), 2030, and 2070 with- and without-project conditions match the HEC-5Q model output provided in the application. For current (2015) conditions, Dry years show a decrease in average July to September temperatures at all locations of about 0.6°F and in Critical years, average July to September temperatures are decreased by about 1.2°F to 1.4°F. For 2030 conditions, Dry years show a decrease in average July to September temperatures at all locations of about 0.2°F to 0.3°F and in Critical years, average July to September temperatures are decreased by about 0.6°F. For 2070 conditions, Dry years show a decrease in average July to September temperatures at all locations of about 0.5°F to 0.65°F and in Critical years, average July to September temperatures are decreased by about 1.44°F to 1.8°F.

## Comment 3: DSM2 Model Review

The applicant states that upstream release actions improve water quality by augmenting Delta inflows and outflows. The Delta water quality could be improved for up to 6 months from July to December in Above Normal, Below Normal, and Dry water years. Review of DSM2 results shows

that the Sites Project improves water quality in October and November for all locations and deteriorates water quality in December for all locations; from July to September, the Sites Project improves water quality in the Western Delta and deteriorates in Jersey Point and South Delta locations.

Applicant Appeal:

*The applicant stated that it could not verify the percent change in EC noted in the Water Operations Review but acknowledged small deterioration in water quality at few locations during some months between July and December in Above Normal, Below Normal, and Dry water years.*

*“We acknowledge the reviewer’s analysis, but were unable to verify all their findings. We notice small deterioration in water quality at few locations during some months between July and December in Above Normal, Below Normal, and Dry water years. However, we find most increases in EC occur in relatively fresh conditions.” (AttachD, p. D-26)*

*The applicant provided supplemental DSM2 model data of monthly EC at eleven Delta locations between with- and without-project conditions for the 2030 and 2070 conditions for long-term, Wet, Above Normal, Below Normal, Dry, and Critical years. The supplemental DSM2 model data shows the percent difference between with- and without-project long-term average December EC is less than 5 percent under 2030 and 2070 conditions for all locations. (AttachD, p. D-27-D-33)*

Water Operations Review Response:

The additional information provided by the applicant in the appeal adequately addresses the comment. Reviewers confirmed the long-term monthly average EC for the 11 Delta locations for the 2030 and 2070 with- and without-project conditions match the DSM2 model output provided in the application. Reviewers also confirmed that the Wet, Above Normal, Below Normal, Dry, and Critical years’ monthly average EC for January through September for the 11 Delta locations for the 2030 and 2070 with- and without-project conditions match the DSM2 model output processed by reviewers. However, for October through December, reviewers noted that the monthly average EC in Wet, Above Normal, Below Normal, Dry, and Critical years for the 11 Delta locations does not match the DSM2 model output processed by reviewers because the applicant quantified the monthly average EC by water year type using January through December of the same calendar year instead of using October of the preceding calendar year through September of the current calendar year as defined by the State Water Resources Control Board D-1641 Sacramento Valley 40-30-30 index. The applicant confirmed that there is small deterioration in water quality at a few locations during some months between July and December in Above Normal, Below Normal, and Dry water years. However, for October through December, the applicant’s reported change in monthly average EC for Above Normal, Below Normal, and Dry years between with- and without-project conditions are lower than the data processed by reviewers due to quantification of EC by water year type by the applicant using calendar year instead of water year. For December, when EC is quantified by water year type by reviewers using

water year, there is deterioration in EC at most of the Delta locations for Above Normal, Below Normal, and Dry years by up to 6 percent for the 2030 conditions and by up to 13 percent for 2070 conditions. Although there is deterioration in EC in December in Above Normal, Below Normal, and Dry years as compared to the without-project conditions, the Delta water quality standards are maintained and not exceeded in the with-project conditions.

## Comment 4: Water Operations Review Conclusion Related to Benefits

There are discrepancies in the benefits quantified by water year type. The applicant summarized CalSim II model results using the five water year classifications included in the State Water Resources Control Board D-1641 Sacramento Valley 40-30-30 index. However, the applicant defined the water year as January through December of the same calendar year when post-processing the modeling results. The SWRCB D-1641 Sacramento Valley 40-30-30 index defines water year as “October 1 of the preceding calendar year through September 30 of the current calendar year.”

Applicant Appeal:

*The applicant changed the water year type reporting of public and non-public benefits using water year (October through September) rather than calendar year as provided in the application.*

Water Operations Review Response:

The additional information provided by the applicant in the appeal adequately addresses the comment. Reviewers confirmed the applicant’s change in water year type reporting of benefits using water year instead of calendar year.

## Comment 5: Refuge Water Supply

The applicant states that the project would provide Incremental Level 4 water supplies to Central Valley Project Improvement Act refuges north and south of the Delta to supplement refuge water supplies up to the Level 4 criteria. Review of the applicant’s CalSim II model results confirm that the long-term averages for 2030 and 2070 conditions match the Incremental Level 4 deliveries claimed by the applicant. Refuge deliveries by water year type were updated to reflect the D-1641 Sacramento Valley 40-30-30 index water year definition.

Applicant Appeal:

*The applicant changed the water year type reporting of Incremental Level 4 refuge water supply using water year (October through September) rather than calendar year and provided the revised refuge supply quantities by water year type in Table 5 (Appeal Letter, p. 14) and Table B-2 (AttachB, p. B-3).*

Water Operations Review Response:

The additional information provided by the applicant in the appeal adequately addresses the comment. The revised Incremental Level 4 water supply deliveries included in Table 5 of the Appeal Letter and Table B-2 of Attachment B match the results of analysis conducted by reviewers.

## Comment 6: Oroville Coldwater Pool

The applicant defines the coldwater pool as an increase in the end of May storage at Lake Oroville for all storage levels. Review of the applicant's CalSim II model results confirm the applicant's stated long-term average increase in the May storage at Lake Oroville by 26 TAF under 2030 conditions and 31 TAF under 2070 conditions. However, the applicant does not provide a temperature model to assess the temperature improvements in the lower Feather River resulting from coldwater pool storage at Lake Oroville.

Applicant Appeal:

*The applicant changed the water year type reporting of the end of May storage in Lake Oroville and provided the revised end of May storage in Lake Oroville by water year type (Appeal Letter, p. 14, Table 6).*

*The applicant also provided a new water temperature model analysis to assess the water temperature improvements in the lower Feather River and provided the water temperature model (Reclamation Temperature Model) and modeling results.*

*"Tables 1 and 2 summarize the flow and temperature results for the Feather River to show benefits achieved in dry and critical years for WSIP 2030 and WSIP 2070 conditions. The model results demonstrate greater water temperature benefits under projected WSIP 2070 conditions when warmer air temperatures and less snow pack will make water temperature management more challenging." (AttachD, p. D-19)*

*The applicant presented long-term and Critical year average change in average May to November and average October to November water temperature at several locations (low flow channel, above Thermalito, below Thermalito, and Gridley) on the Feather River for the 2015, 2030, and 2070 conditions. The water temperature results showed that larger temperature reductions in the Feather River generally occurred in critical years, ranging from 0.1 to 0.6°F for May to November to 0.2 to 1.1°F for October to November.*

Water Operations Review Response:

The additional information provided by the applicant in the appeal adequately addresses the comment on coldwater storage at Lake Oroville. The revised coldwater pool storage at Lake Oroville – calculated as change in end of May storage – matches the analysis conducted by reviewers.

Reviewers reviewed the analysis of water temperature in the Feather River by using the temperature model results of the Reclamation Temperature Model provided by the applicant. Reviewers verified the temperature results at Feather River immediately below the Thermalito Complex to show benefits achieved in Wet, Above Normal, Below Normal, Dry, and Critical years for the 2030 and 2070 conditions. Reviewers noted that the applicant did not compare the model results at a location in the Feather River just upstream of the confluence with the Sacramento River. The applicant presented long-term and Critical year average change in average May to November water temperature at several locations (low flow channel, above Thermalito, below Thermalito, and Gridley) on the Feather River for the 2015, 2030, and 2070 conditions. Reviewers confirmed that the temperature reduction in the Feather River for long-term, Wet, Above Normal, Below Normal, Dry, and Critical water years matches the results of the Reclamation Temperature Model. The water temperature results showed that larger temperature reductions in the Feather River generally occurred in Critical years, ranging from 0.1 to 0.6°F for May to November and 0.2°F to 1.1°F for October to November. Reviewers also noticed that the applicant quantified the monthly average temperature by water year type using January through December of the same calendar year instead of using October of the preceding calendar year through September of the current calendar year.

## Comment 7: Yolo Bypass Flows

The applicant states that the project will be operated to release two pulse flows of at least 400 cubic feet per second (cfs) each over a 2- to 3-week period between August and October in all years into Yolo Bypass near Knights Landing Ridge Cut to increase desirable food sources for Delta Smelt and other key fish species in the lower Cache Slough and lower Sacramento River areas.

Review of the applicant's CalSim II model results indicate that long-term average annual Yolo Bypass flow into the Delta decreases by 84 TAF per year under 2030 conditions, and by 116 TAF per year under 2070 conditions.

### Applicant Appeal:

*The applicant provided supplemental analysis that examined the frequency and duration of spills over the Fremont Weir as well as the total flows in the Yolo Bypass that would provide rearing habitat for salmonids and splittail. The applicant also provided new analysis through the application of the OBAN lifecycle model that incorporates the effects of Yolo Bypass flows on salmonids.*

*"The Authority has addressed these impacts in the revised analysis through the application of the OBAN lifecycle model that incorporates the Yolo Bypass effects on salmonids (see Attachments A.1, A.2, and A.3). This enables us to comprehensively evaluate benefits and impacts to salmonids and Delta smelt independently." (Appeal Letter, p. 12)*

*“The mean number of days with Yolo Bypass flooding (Fremont Weir flow >3,500 cfs) during January-June ranged from 0 in critically dry years with 2015 climate to 54-55 days in wet years with 2070 climate... The differences in mean duration of flooding between Without and With Project scenarios were small, 1-2 days..., and the frequency of flood duration over the 82-year simulation was not greatly different between Without and With Project scenarios... ” (AttachA, p. A-68)*

Water Operations Review Response:

The additional information provided by the applicant agrees with the reviewers’ assessment that Yolo Bypass flows decrease during the winter. The applicant also conducted a new lifecycle analysis using the OBAN lifecycle model to assess the impacts on fish from decreased Yolo Bypass flows. The review of the OBAN lifecycle model is outside the purview of the Water Operations reviewers.

## Comment 8: Water Supply Deliveries to Agricultural and M&I Users

The applicant does not explicitly define the south of Delta agricultural and municipal and industrial (M&I) water users receiving water deliveries from the project; reviewers cannot match the change in total water supply deliveries to the south of Delta agricultural and M&I water users as claimed by the applicant in the amount 130 TAF per year under 2030 conditions and 147 TAF per year under 2070 conditions.

The applicant does not explain how the 11 TAF south of Delta recaptured water was quantified. Therefore, reviewers are not able to verify this water supply benefit.

Applicant Appeal:

*The applicant described how the total South of Delta water deliveries were computed.*

*“Average annual deliveries to South of Delta Sites Project Participants were calculated on an October-September SWRCB D-1641 water year basis by taking the difference between the with- and without-project scenario of total South of Delta project deliveries for each climate scenario. Total South of Delta project deliveries are the summation of the SWPTOTALDEL and CVPTOTALDEL summary outputs from CalSim II. These outputs summarize South of Delta SWP agricultural and municipal and industrial (M&I) deliveries and CVP agricultural, M&I, exchange contractor, and Level 2 refuge deliveries, respectively... Deliveries were divided among Sites Project participants according to their Sites Project participation.” (AttachD, p. D-37)*

*The applicant removed the 11 TAF south of Delta recaptured water supply from the estimation of monetized benefits.*

Water Operations Review Response:

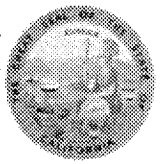
The additional information provided by the applicant in the appeal adequately addresses the comment. The revised south of Delta water supply deliveries included in

Table D.9-1 (AttachD, p. 37) match the analysis conducted by reviewers. As noted by the applicant, the water supply deliveries are distributed among agricultural and M&I users based on their respective participation rates. These participation rates are not reflected in the CalSim II model and therefore, changes in water supply deliveries resulting from the Sites Project to individual contractors south of Delta cannot be tracked using the CalSim II model results. A review of Tables D.9-2 through D.9-4 (AttachD, p. D-38-D-40) confirms that the participation ratios are held relatively constant across 2015, 2030, and 2070 conditions.



State of California – Natural Resources Agency  
DEPARTMENT OF FISH AND WILDLIFE  
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EDMUND G. BROWN JR., Governor  
CHARLTON H. BONHAM, Director



April 9, 2018

Joseph Yun  
Executive Officer  
California Water Commission  
P.O. Box 942836  
Sacramento, CA 94236-0001

Dear Mr. Yun:

### **ANALYSIS OF WATER STORAGE INVESTMENT PROGRAM PROJECT APPEALS OF REVISED PUBLIC BENEFIT RATIOS**

This letter and the attached appeal responses from the California Department of Fish and Wildlife (Department) represent an important step in the transparent, fair, and competitive process the California Water Commission (Commission) is undertaking to invest in water storage in the state. As you know, a broad range of stakeholders hold widely divergent perspectives about the Commission process. In my opinion, your process has worked. The project appeals of the revised public benefit ratios proves this point. After following the appeals process in the regulations, the Department's revised recommendations could result in restoring almost \$1.2 billion in ecosystem benefits and funding requests.

On January 29, 2018, the Department submitted a letter to you summarizing the Department's technical review of Water Storage Investment Program (WSIP) projects' monetized ecosystem benefits and our recommendations regarding the applicants' supporting information for the ecosystem benefits that factored into projects' public benefit ratio (PBR). In some cases, the Department found the information in the application did not substantiate the ecosystem benefit claimed and recommended the monetized ecosystem benefit not be included in the calculation of the project's PBR. California Code of Regulations, title 23, section 6008 allows an applicant to appeal a PBR that has been modified. The regulations limit the scope of the appeals to a "written rebuttal of specific Staff comments or reasons for Staff modifications," "new supporting information, if any, specific to the written rebuttal to support the value the applicant claims is correct," and "reference to existing application information to support the rebuttal." (Cal. Code Regs., tit. 23, § 6008, subd. (1)(C-E)).

On February 23, 2018, 10 WSIP project applicants submitted appeals of the recommended modifications to the PBRs for their projects. Using the standards established in the WSIP regulations, the Department conducted a technical review of the appeal material submitted by the project applicants. In accordance with the regulations, the Department only considered material specific to written Staff comments included in the comments on the application materials. In the majority of cases, the Department concluded that the information provided in the appeal material was sufficient to support the monetized ecosystem benefits that were removed based on the

*Conserving California's Wildlife Since 1870*

Mr. Joseph Yun, Executive Officer  
California Water Commission  
April 9, 2018  
Page 2

Department's comments on the application material. Nine monetized ecosystem benefits fall into this category and the Department recommends including these benefits in the calculation of a project's PBR.

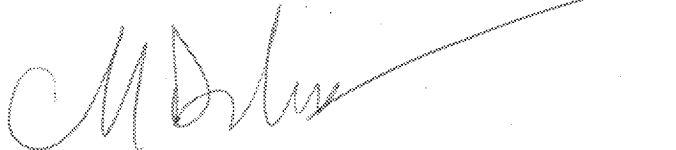
In a few cases, the Department concluded that the appeal material did not substantiate the ecosystem benefit and therefore the concerns raised by the Department in its comments on the application material remain unaddressed. This occurred for five monetized ecosystem benefits where the Department was not able to conclude that a net ecosystem improvement was established by the information submitted by the applicants in the appeal material.

Some applicants chose not to appeal the recommended removal of an ecosystem benefit from the PBR. This occurred for four monetized ecosystem benefits.

The Department recognizes the value and importance of additional surface water and groundwater storage in California. As called for in the California Water Action Plan, water storage is needed for environmental benefits as well as for water supply. The Department is encouraged by the number of applicants that submitted appeal information demonstrating that their projects will provide net ecosystem improvements. These projects represent a broad range of project types, including surface storage projects identified in the CALFED ROD, regional surface storage projects, conjunctive use projects, and groundwater storage projects. Additionally, these projects are distributed across the state from Southern California to north of the Delta, from the Central Valley to the coastal ranges.

The Department looks forward to continuing to work with the Commission in the evaluation of projects applying for funding under the WSIP.

Sincerely,



Charlton H. Bonham  
Director

Enclosures: Appeal Responses

cc: California Department of Fish and Wildlife

Nathan Voegeli, Acting Chief Deputy Director  
[Nathan.Voegeli@wildlife.ca.gov](mailto:Nathan.Voegeli@wildlife.ca.gov)

Tina Bartlett, Acting Deputy Director  
Ecosystem Conservation Division  
[Tina.Bartlett@wildlife.ca.gov](mailto:Tina.Bartlett@wildlife.ca.gov)

Scott Cantrell, Water Branch Chief  
[Scott.Cantrell@wildlife.ca.gov](mailto:Scott.Cantrell@wildlife.ca.gov)

## **Appeal Response Sites Project**

On February 1, 2018, the California Water Commission Executive Officer sent a letter to the Sites Project Authority (applicant) regarding the Public Benefit Ratio (PBR) Review conducted for the Sites Project (Project). Among other things, the February 1 letter included a modified PBR for the Project and a summary of the technical review conducted by the California Department of Fish and Wildlife (Department) related to the Project's monetized ecosystem benefits. The Department provided comments and recommendations regarding the support for the ecosystem benefits that factored into the Project's PBR.

On February 23, 2018, the applicant submitted an appeal of the modified PBR. The Department reviewed the appeal material pertaining to the monetized ecosystem benefits and concludes that the anadromous fish and Oroville coldwater pool monetized ecosystem benefits are insufficiently supported by the information provided. The Department maintains its original recommendation to remove the anadromous fish and Oroville coldwater pool monetized ecosystem benefits from the calculation of the Project's PBR. The Department concludes that the Yolo Bypass flows monetized ecosystem benefit is sufficiently supported by the information provided and, therefore, recommends inclusion of the Yolo Bypass flows monetized ecosystem benefit in the calculation of the Project's PBR.

The Department's responses to the Project's appeal are as follows:

### **Anadromous Fish Monetized Ecosystem Benefit**

In its comments on the application material, the Department identified four main areas of concern. First, the use of SALMOD to calculate the number of fish that will benefit over the life of the Project did not accurately represent salmon population dynamics, nor did it account for annually changing population levels. Second, impacts to salmonids resulting from reduced river flows downstream of the proposed Project diversion points were not analyzed or disclosed in the quantification of net benefits. Third, SALMOD inputs and assumptions were not explained. Fourth, SALMOD inputs were higher than recent data indicate.

In the appeal material, the applicant provided revised SALMOD inputs that considered more recent starting populations, additional information on SALMOD assumptions, an OBAN analysis (a life cycle model for winter-run salmon), and a flow survival-effects analysis to generate a mechanism for calculating flow-related impacts associated with the Project's operations.

The results of the applicant's net benefits analysis are shown in Table A.1-5 in Attachment A to the appeal material.<sup>1</sup> The results indicate that there are net impacts to fall-run Chinook salmon under 2015 climate conditions and to spring-run Chinook salmon under 2030 climate conditions. Net impacts that could occur in the near future as a result of the Project could cause impacts that would not be offset by potentially beneficial conditions in the long-term.

The Department finds that the SALMOD assumptions and revised inputs provided in the appeal are reasonably explained and reflective of more recent and accurate data sets. However, the Department's concerns about the use of SALMOD to calculate the number of fish that will benefit over the life of the Project remain unresolved. As noted in the Department's comments on the application material, SALMOD treats production results separately for each year rather than compounding outcomes over

time. Each modeled year produces a change in production for each run of Chinook salmon at Red Bluff, and these yearly results are summed over the 82-year simulation period to produce a net change in salmon production levels. Because SALMOD is programmed to use the same starting numbers each year, the model is unable to account for variations in annual population levels. For example, SALMOD is unable to account for consecutive years in which a returning run contains a lower population than the preceding year. Because SALMOD does not account for annually changing population levels, there is high uncertainty in the resulting SALMOD outputs used to quantify net changes in salmon production.

In the appeal material, the applicant conducted a flow-survival effects analysis to account for the potential impacts associated with Project diversions on the Sacramento River that were identified in the Department's comments on the application. The net changes in salmon production numbers for each of the three climate scenarios were calculated by taking the salmon production numbers at Red Bluff, as calculated by SALMOD, and adjusting these outputs by the relative change in survival based on the flow-survival effects analysis. The relative change in survival was calculated using the change in flow below the Delevan intake. As fish migrate through the system, multiple factors in each section of the river can affect survival. The quantification of net benefits provided in the appeal analysis does not account for the cumulative reduction in survival in sections of the river upstream or downstream of the Delevan intake. Therefore, this flow-survival analysis does not evaluate the benefits to one life stage and impacts to other life stages. Thus, the Department is unable to make a determination regarding the claimed net benefit to all runs of Chinook salmon.

A lifecycle model could be used to evaluate these benefits and impacts. The applicant provided an analysis using the OBAN lifecycle model to simulate Sacramento River winter-run Chinook salmon population dynamics for the with- and without-project scenarios. The applicant notes that the with-project scenarios were also simulated considering an adjustment to survival downstream of Red Bluff Diversion Dam, recognizing potential effects related to reduced Sacramento River flows downstream of the Sites diversions. The applicant concluded that the results demonstrated an improvement in winter-run escapement. However, the applicant did not provide the modeling data for the OBAN analysis of winter-run Chinook salmon. Therefore, the Department cannot verify or evaluate the OBAN model outputs and conclusions presented in the appeal. Pursuant to the Technical Reference Document, reviewers must be able to verify all calculations, inputs and outputs, and information used by other models in the applicant's overall analysis. (Technical Reference, § 4.3.8.1 at p. 4-30.) Without this data, the Department cannot verify the OBAN results and is unable to substantiate the conclusion of net benefits to winter-run salmon. The appeal material did not include an analysis to link the benefits and impacts to each life stage of spring-run Chinook salmon, fall-run Chinook salmon, or late-fall-run Chinook salmon. As such, the Department is unable to verify the applicant's claimed net benefit to all runs of Chinook salmon.

The flow-survival effects analysis quantifies a change in survival at a single location downstream of the proposed Delevan intake. However, proposed Project operations would likely increase diversions at the Tehama-Colusa Canal and the Glenn-Colusa Irrigation District Main Canal, which are upstream of the Delevan intake. The appeal does not consider the potential cumulative effects that each of these diversions may have on migrating fish. Additionally, fish will likely experience decreased survival downstream of the single location below the Delevan intake due to reduced flows in the Lower Sacramento River and through the Sutter and Yolo Bypasses. These potential impacts were not considered in this analysis.

In the flow-survival effects analysis, the applicant evaluated several studies presenting flow-survival relationships. The applicant selected the relationship presented in the Iglesias<sup>2</sup> study for the purpose of

quantifying a change in survival from decreased flows. As illustrated by Figure A.2-6 in Attachment A to the appeal,<sup>1</sup> the Iglesias study utilizes the flattest flow-survival curve when compared to survival curves of similar studies. The slope of the Iglesias derived curve illustrates that for a given increment of flow increase, the corresponding survival will have the lowest calculated increase. Each study presented in Figure A.2-6 has strengths and limitations, and there will be uncertainties in the results regardless of which flow-survival curve is used. To account for uncertainty, a sensitivity analysis using multiple flow-survival curves would demonstrate the potential range of variability in survival in light of reduced flows.

Additionally, the flow-survival effects analysis calculated annual survival estimates for each run using an average of survival values in primary migration months. Using the average may obscure potentially significant impacts in some months under some water year types. To determine a net change from flow impacts, the annual survival estimates were again averaged over the 82-year simulation period and the relative change in long-term average annual survival is presented. As with the survival estimates, using an average may obscure potentially significant impacts in some years.

The applicant proposes to provide a pulse flow mitigation measure to offset expected impacts to salmon from the Project's diversions. This measure would institute an operational rule that disallows diversion for several days after a rain induced pulse of a certain magnitude. The applicant assumes that 50% of migrating fish will move through the system after a pulse event, citing the Rosario study.<sup>3</sup> Although a no diversion period after high rain pulses may reduce impacts, the extent to which this measure will reduce impacts is uncertain. The Rosario study looked at how large storm flow events affect migration by analyzing winter-run catch data near Knights Landing. However, the migration of other runs of salmon during rain pulses cannot be assumed from this study. Further, some runs tend to delay migration and rear much longer in the watershed, and the Sites diversions occur further upstream than the point examined by the study. Therefore, salmonids may respond differently than presented in the Rosario study, and the effectiveness of the mitigation measure may be less than the applicant proposes. Additionally, fish can migrate during a pulse event that would not trigger the mitigation measure. In this instance, this measure would not be protective of fish. The applicant anticipates that the pulse flow operations will be informed by real-time monitoring of fish movement. However, it is unclear how that information will be collected and provided in a timely manner so that it can influence real-time operations.

For the reasons described above, the Department finds the anadromous fish monetized ecosystem benefits are not substantiated by the information provided in the appeal.

#### **Oroville Coldwater Pool Monetized Ecosystem Benefit**

In its comments on the application material, the Department noted that it could not verify the Oroville coldwater pool monetized ecosystem benefit because the applicant did not provide a temperature model to assess temperature benefits, nor did the applicant quantify the resulting ecosystem improvement from a change in temperature. In response to these concerns, the appeal material contains a Reclamation Temperature Model (RecTemp) to assess temperature changes on the Feather River resulting from Project operations. In the appeal material, the applicant notes the RecTemp modeling indicates a net temperature improvement based on the long-term average under 2015, 2030, and 2070 climate conditions.

The modeled temperatures in the Feather River under with- and without-project conditions generally fall within the temperature criteria of the Oroville FERC Settlement Agreement<sup>4</sup> for the low flow channel. The modeled operations for the applicant's project do not decrease temperatures to meet

established targets when exceedances occur. Modeled temperatures for above Thermalito Afterbay also fall within the existing protective temperature targets for anadromous fish.

The Oroville FERC Settlement Agreement currently does not have finalized temperature targets for the high flow channel (HFC). However, the water temperatures specified in the Settlement Agreement, Appendix A, Table 2 (56-64°F) for the HFC will serve as a starting point for development of future HFC temperature targets to support anadromous fish. In most cases, with-project modeled temperatures on the Feather River at the below Thermalito and Gridley locations do not provide temperature improvements to acceptable thresholds when temperatures fall outside the optimal range for Chinook salmon. In October under 2030 climate conditions, model results show that temperatures are lowered to meet targets in some water year types under with-project conditions. However, in summer months, across multiple year types and under all climate conditions, the Project raises temperatures above without-project conditions. Because the majority of temperature changes with-project do not lower temperatures to meet protective temperature targets, and because the Project raises temperatures in many cases, the Department is unable to conclude that a temperature improvement will occur as a result of Project operations.

For the reasons described above, the Department finds that the Oroville coldwater pool monetized ecosystem benefit is not substantiated by the information provided in the appeal.

#### **Yolo Bypass Flows Monetized Benefit**

In its comments on the application material, the Department expressed concerns about the net reductions in flows through the bypass, as identified by the Water Operations review. The Department noted that potential impacts resulting from the reduced Yolo Bypass flows were not analyzed or disclosed. The Department also noted that ecosystem benefits resulting from pulse flows through the Yolo Bypass are consistent with the Delta Smelt Resiliency Strategy.

In the appeal material, the applicant provided an analysis of flows, weir spills, and habitat inundation in the Yolo Bypass area. Based on these analyses, the applicant concluded that the mean duration of flooding events within the bypass was reduced by up to 2 days under with-project conditions. Therefore, the applicant concluded that the impacts to the Bypass would not likely limit salmonid population growth.

The appeal analysis indicates an average decrease of spill events by 0-2 days. Two days equals an average annual reduction of 15% and this reduction has the potential to be significant. When considering impacts (reduction in entrainment of juvenile salmon into Yolo Bypass), the amount of flow coming over Fremont Weir is important, because there is a positive relationship between flow and juvenile fish entrainment. Any reductions in Sacramento River flows at Fremont Weir may be at odds with the Salmon Resiliency Strategy and the planned salmonid habitat restoration projects in the Yolo Bypass.

The analysis provided in the appeal material allowed the Department to distinguish the aforementioned potential impacts to salmon from the benefits proposed to Delta smelt. Although the Department reserves its concerns regarding the impacts to salmon that could result from the operations of the Project, pulse flows through the Yolo Bypass are consistent with the Delta Smelt Resiliency Strategy. Evaluating the proposed benefits to Delta smelt separately from the potential impacts to salmon, the Department finds that the proposed flows to the Yolo Bypass are an ecosystem benefit and substantiated by the information provided.

<sup>1</sup>Sites Project Authority. Attachment A Anadromous Fish (Sacramento River). 2018.  
<https://cwc.ca.gov/WISPDocs/AttachA.pdf>

<sup>2</sup>Iglesias, I. S., M. J. Henderson, C. J. Michel, A. J. Ammann, and D. D. Huff. 2017. Chinook Salmon Smolt Mortality Zones and the Influence of Environmental Factors on Out Migration Success in the Sacramento River Basin. Prepared for U.S. Fish and Wildlife Service, Pacific Southwest Region, Central Valley Project Improvement Act, Sacramento, CA. Agreement Number F15PG00146. April. National Marine Fisheries Service, Southwest Fisheries Science Center, Santa Cruz, CA.

<sup>3</sup>del Rosario, R. B., Y. J. Redler, K. Newman, P. L. Brandes, T. Sommer, K. Reece, and R. Vincik. 2013. Migration patterns of juvenile winter-run-sized Chinook Salmon (*Oncorhynchus tshawytscha*) through the Sacramento–San Joaquin Delta. *San Francisco Estuary and Watershed Science* 11(1).

<sup>4</sup>State of California, Resources Agency, Department of Water Resources. 2006. Settlement Agreement for Licensing of the Oroville Facilities FERC Project No. 2100.  
[https://www.water.ca.gov/LegacyFiles/orovillerelicensing/docs/settlement\\_agreement/Settlement%20Agreement.pdf](https://www.water.ca.gov/LegacyFiles/orovillerelicensing/docs/settlement_agreement/Settlement%20Agreement.pdf).

**DEPARTMENT OF WATER RESOURCES**

1416 NINTH STREET, P.O. BOX 942836  
SACRAMENTO, CA 94236-0001  
(916) 653-5791



April 12, 2018

Joseph Yun  
Executive Officer  
California Water Commission  
P.O. Box 942836  
Sacramento, CA 95814-0001

RE: Proposition 1 Water Storage Investment Program

Dear Mr. Yun:

This is an exciting stage in the implementation of the Proposition 1 Water Storage Investment Program (WSIP) as the California Water Commission (Commission) is on the brink of investing \$2.7 billion toward new water storage projects. The Department of Water Resources (DWR) is committed to its ongoing role of providing the Commission expert technical review and support.

DWR is pleased that the additional conversations with applicants have resulted in an improved understanding of these projects. We look forward to the next phase when the Commission will make its determination and begin awarding funding. Investments in storage are critically needed across the state to ensure flood control protection, improve ecosystems and water quality, and to improve the resiliency of our water infrastructure and supplies.

We commend the Commission on its continued commitment to working with applicants and stakeholders in a transparent manner as it navigates the complexities of implementing this one-of-a-kind public investment program. The task before the Commission is not easy.

DWR looks forward to our continued partnership and appreciates the important work that will take place in the coming weeks before preliminary decisions are made in July.

Sincerely,

A handwritten signature in black ink that reads "Karla A. Nemeth".

Karla A. Nemeth  
Director

**DEPARTMENT OF WATER RESOURCES**1416 NINTH STREET, P.O. BOX 942836  
SACRAMENTO, CA 94236-0001

April 12, 2018

Mr. Joseph Yun  
Executive Officer  
California Water Commission  
Post Office Box 942836  
Sacramento, California 94236-0001Project: Sites Project  
Applicant: Sites Project Authority**RE: Water Storage Investment Program —Public Benefits Ratio  
Recommendations – Response to Applicant's Appeal**

Dear Mr. Yun:

With this letter, the Department of Water Resources (DWR) provides the California Water Commission the public benefits recommendation for acceptance, adjustment, or removal of the applicant's appealed physical benefits from the public benefits ratio (PBR) for the Water Storage Investment Program (WSIP) Proposition 1 application.

**DWR maintains the original recommendation for the adjustment to the flood control physical benefit in the PBR calculation.**

DWR staff evaluated each benefit addressed in the applicant's appeal. The information provided by the applicant in support of each claimed monetized benefit was reviewed in a consistent manner across all applications for the summary of recommendations listed below. DWR did not attempt to replicate or modify models and did not evaluate the project's claimed monetized benefits outside of the information provided in the application and appeal.

During the appeal reviews, DWR staff had the option to recommend adjustment of the physical benefit if the PBR physical benefit was not supported by the additional information provided in the applicant's appeal. If the methods used or values supplied in the appeal were not supported, and staff could not adjust the PBR, the monetized public benefit value was recommended for removal from the total PBR calculation.

**Summary of Recommendations:**

Flood Control:

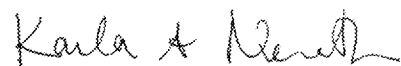
DWR's original PBR recommendation:

*DWR recommends the adjustment of this physical benefit to the PBR calculation. The Sites Project flood control physical benefit was adjusted for the reason listed below:*

- DWR staff recommends the adjustment to the Sites Project's physical flood control benefit. The adjustment is to the without-project water surface elevation in the downstream floodplain from 5-feet of depth above first floor elevation to 3-feet of depth above adjacent grade for the 100-year flood event. The 3-feet of depth is consistent with the publicly available FEMA National Flood Insurance Rate Map used in the National Flood Insurance Program. The applicant's 5-feet without-project flood depth above the first floor elevation for the full range of flood events is not verifiable and has not been sufficiently documented. It is not clear if the applicant developed and ran additional models to support the 5-feet without-project flood depth.*

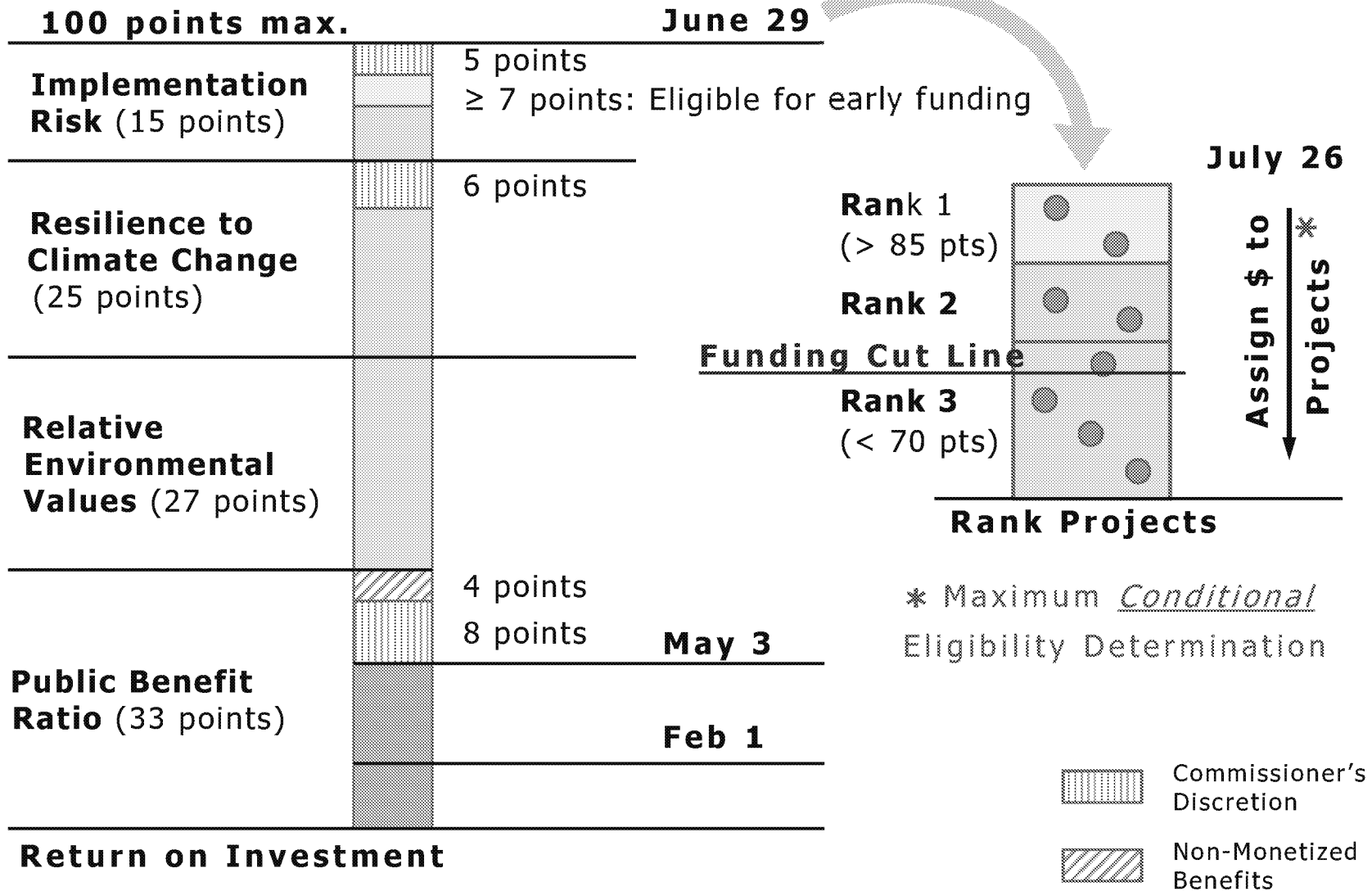
**The applicant accepted the recommended adjustment during their appeal. DWR maintains the original recommendation for the adjustment to the flood control physical benefit in the PBR calculation.**

Sincerely,



Karla A. Nemeth  
Director

# State's Proposition 1 (WSIP)



# Congress of the United States

Washington, DC 20515

April 30, 2018

Armando Quintero  
Chair, California Water Commission  
P.O. Box 942836  
Sacramento, California 94236-0001

Dear Chairman Quintero,

We appreciate the extraordinary dedication of the California Water Commission (Commission), its staff, and administering agencies to significantly advance the Water Storage Investment Program (WSIP) over the past year. We are concerned, however, that the Commission may be missing a once-in-a-generation opportunity to increase cold water reserves for Central Valley salmon through storage investments.

We are struck that only \$195 million, or 7% of the \$2.7 billion in available funding, could go to Central Valley salmon benefits based on the staff-recommended Public Benefit Ratios (see chart in attachment). We are further concerned that the full suite of salmon benefits from projects have not been analyzed in their entirety. We urge the Commission to complete these evaluations before awarding the voter-approved funding, in order to take advantage of this extraordinary opportunity to increase our salmon species' resiliency to drought and climate change.

In 2014, California voters overwhelmingly approved Proposition 1, which dedicated \$2.7 billion for water storage projects that provide public benefits. Over two-thirds of California voters supported the measure, not just to provide more water storage, but also to improve the health of ecosystems and fisheries throughout the state, including threatened Central Valley salmon.

Given that environmental benefits are the primary focus of the \$2.7 billion in voter-approved funding, we would have expected more than 7% of the benefits to go to Central Valley salmon. California's great salmon runs on the Sacramento and San Joaquin Rivers and their tributaries represent a vital economic and cultural resource for California, and existing public policy has made great efforts to preserve this population against environmental and manmade threats.

Moreover, our changing climate is likely to increase threats to salmon by bringing more extreme droughts further aggravated by increasing temperatures. Our limited cold-water storage was catastrophic for winter-run chinook salmon in 2014 and 2015. Well-placed storage projects that reserve large blocks of environmental water could be critical in helping salmon weather future droughts aggravated by climate change.

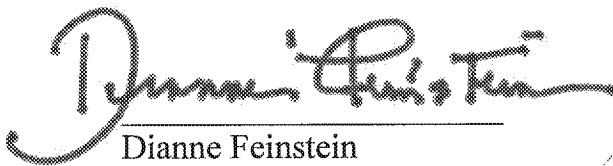
Our review of Commission staff responses to project appeals suggests that in a number of instances administering agencies did not fully evaluate projects' asserted salmon benefits. For example, the agencies would not accept projected benefits for one project from models such as SALMOD and OBAN that were listed in the Commission's technical reference documents as models that applicants could use.<sup>1</sup>

Additionally, upon review of the applicants' appeal for this project, the Department of Water Resources (DWR) found a substantial flow benefit in the spring time<sup>2</sup> and a substantial temperature reduction benefit for salmon in the critical July to September months<sup>3</sup>, yet these were not recognized as ecosystem benefits. We would hope that administering agencies would thoroughly analyze the effects on the salmon of the spring flow benefit and the summer cold water temperature benefit that DWR identified.

As the Commission deliberates over the WSIP funding, we strongly urge you to fully evaluate the potential salmon benefits of the proposed projects before awarding the funding. We believe that the \$2.7 billion in voter-approved funding provides perhaps the last good opportunity to improve California's water infrastructure specifically to safeguard our threatened salmon runs against climate change and drought.

We greatly appreciate your consideration of our comments.

Sincerely,



Dianne Feinstein  
United States Senator



John Garamendi  
United States Representative

Cc: California Water Commission Members

Attachments

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<sup>1</sup> The administering agencies rejected Sites Reservoir's use of the OBAN results, because the applicant did not provide the modeling data for the OBAN analysis so the agencies could not verify the results (Page 2 of 5 of the attachment to the California Department of Fish and Wildlife letter to the Commission, attached). However, the attached excerpt from the Technical Reference Document shows that the Commission cited OBAN as a model that could be used, and OBAN is a proprietary model where the inputs are not available (See attached highlighted language on page 4-105 of the Technical Reference Document). So it appears that the Commission referred the applicants to use a model that the administering agencies then rejected based on its inherent proprietary nature.

<sup>2</sup> Water Operations Review Response to Applicant's Appeal on Public Benefits Ratio: Sites Project; Comment 1.4.

<sup>3</sup> Water Operations Review Response to Applicant's Appeal on Public Benefits Ratio: Sites Project Comment 2.

Footnote #1

<b>Table 4-12. Summary of Models, Methods, and Approaches for Assessing Ecosystem Improvements.</b>				
<b>Resource Effects</b>	<b>Tools</b>	<b>Key Inputs and Assumptions</b>	<b>Outputs</b>	<b>Notes/Limitations/Links</b>
<b>Reservoir Effects</b>				
Effects on reservoir fish spawning success	DFW regression model	Requires CalSim II flow inputs to estimate monthly and daily changes in water surface elevation.	Estimates bass nesting success	Coarse output.  The DFW regression models and an example application are documented in Appendix 9F of the Long-Term Operation (LTO) Environmental Impact Statement (EIS) (Reclamation, 2015).
Surface water temperature in rivers and reservoirs	HEC-5Q and Reclamation Temperature Models Other temperature models listed in Deas & Lowney, 2000, including CE-QUAL-W2	Requires CalSim II inputs.	Estimates daily temperatures (HEC-5Q) and monthly temperatures (Reclamation Temperature Model) in riverine surface waters, and monthly temperatures in reservoirs (HEC5Q and Reclamation Temperature Model).	Only CVP and SWP reservoirs are modeled.
<b>Riverine Effects</b>				
Impacts/changes to salmon early life stages	Reclamation Salmon Mortality Model. Also referred to as Egg Mortality Model	Requires temperature inputs from HEC-5Q and Reclamation Temperature Model.	Estimates Chinook salmon egg and pre-emergent fry losses on Sacramento, Feather, American, Stanislaus rivers, annually.	May underestimate temperature related mortality and may not be sensitive enough to capture small differences in scenarios.  DFW SOPs and OA/QC documents may be accessed here: <a href="https://www.wildlife.ca.gov/Conservation/Watersheds/Instream-Flow/SOP">https://www.wildlife.ca.gov/Conservation/Watersheds/Instream-Flow/SOP</a>
In-river salmonid production	<del>SALMOD</del>	Requires temperature and flow inputs from HEC-5Q.	Estimates survival and mortality of Chinook salmon (all races, several life stages) in Sacramento River mainstem; specifically, from Keswick Dam to Red Bluff Pumping Plant.	Simulates annual growth, movement, mortality of various life stages based on an initial annual adult population that resets each biological year.  <del>Not a true life cycle model</del> because it treats production results separately for each year rather than compounding outcomes over time. Without careful consideration of inputs this model may underestimate impacts and overestimate benefits.
In-river physical habitat	PHABSIM	WUA. Requires flow inputs (e.g., CalSim II) and established	Estimates habitat area and suitability for salmonids (by life stage) and other target fish species based on stream flows.	Flow/WUA relationships have not been developed for many species, life stages, and drainages. Monthly CalSim II time step may be too broad. The PHABSIM modeling tool is available at

<b>Table 4-12. Summary of Models, Methods, and Approaches for Assessing Ecosystem Improvements.</b>				
<b>Resource Effects</b>	<b>Tools</b>	<b>Key Inputs and Assumptions</b>	<b>Outputs</b>	<b>Notes/Limitations/Links</b>
Geomorphic Function and Riparian Vegetation	SRH Modeling Package SRH-2D SRH-Capacity SRH-Meander RHEM SRH-1DV	Requires input hydrology, channel geometry information, sediment information, and vegetation growth information	<ul style="list-style-type: none"> <li>• SRH-2D gives a variety of hydraulic and sediment transport outputs such as stage, velocity, bed shear stress, erosion and deposition.</li> <li>• SRH-Capacity gives estimates of sediment loads</li> <li>• SRH-Meander gives river meandering tendencies</li> <li>• RHEM simulates cottonwood seedling growth</li> <li>• SRH-1DV simulates riparian vegetation establishment, growth, and mortality</li> </ul>	All models were developed by Reclamation's Technical Service Center. Contact the Technical Service Center ( <a href="http://www.usbr.gov/research/about/index.html">http://www.usbr.gov/research/about/index.html</a> ) for further information about these modeling tools. See also Reclamation (2011, 2012).
Juvenile fall-run and spring-run Chinook salmon abundance and growth by habitat area.	ESHE			Cramer Fish Sciences. 2011. Estimating Rearing Salmonid Habitat Area Requirements: A demonstration of the Emigrating Salmonid Habitat Estimation (ESHE) Model for California Fall-run Chinook salmon, <i>Oncorhynchus tshawytscha</i> . Prepared for the Nature Conservancy. 48 pages
Potential of habitat to support salmonids.	EDT (Ecosystem Diagnosis and Treatment)	Water temperature and flow.	Spatially explicit estimates of density independent productivity, carrying capacity, and adult abundance.	Developed by ICF International. Available at: <a href="https://edt.codeplex.com/">https://edt.codeplex.com/</a>
<b>Delta Effects</b>				
In-river, Delta, and ocean survival of winter-run Chinook salmon	OBAN	Requires CalSim II flow and Delta Cross Channel inputs and HEC-5Q temperature inputs.	Estimates winter-run Chinook salmon escapement and ocean survival.	Proprietary model of R2 Resource Consultants. Model is limited to winter-run and spring-run Chinook salmon.
Delta smelt entrainment	USFWS regression model DSM2 PTM	Requires CalSim II OMR Flow inputs	Estimates proportional loss of both larval/juvenile Longfin and Delta smelt. Estimates adult Delta smelt entrainment losses.	The USFWS regression model and an example application are documented in Appendix 9G of LTO EIS. Relies only on OMR flows to explain loss/salvage, and does not incorporate adult distribution data.

## **Appeal Response Sites Project**

On February 1, 2018, the California Water Commission Executive Officer sent a letter to the Sites Project Authority (applicant) regarding the Public Benefit Ratio (PBR) Review conducted for the Sites Project (Project). Among other things, the February 1 letter included a modified PBR for the Project and a summary of the technical review conducted by the California Department of Fish and Wildlife (Department) related to the Project's monetized ecosystem benefits. The Department provided comments and recommendations regarding the support for the ecosystem benefits that factored into the Project's PBR.

On February 23, 2018, the applicant submitted an appeal of the modified PBR. The Department reviewed the appeal material pertaining to the monetized ecosystem benefits and concludes that the anadromous fish and Oroville coldwater pool monetized ecosystem benefits are insufficiently supported by the information provided. The Department maintains its original recommendation to remove the anadromous fish and Oroville coldwater pool monetized ecosystem benefits from the calculation of the Project's PBR. The Department concludes that the Yolo Bypass flows monetized ecosystem benefit is sufficiently supported by the information provided and, therefore, recommends inclusion of the Yolo Bypass flows monetized ecosystem benefit in the calculation of the Project's PBR.

The Department's responses to the Project's appeal are as follows:

### **Anadromous Fish Monetized Ecosystem Benefit**

In its comments on the application material, the Department identified four main areas of concern. First, the use of SALMOD to calculate the number of fish that will benefit over the life of the Project did not accurately represent salmon population dynamics, nor did it account for annually changing population levels. Second, impacts to salmonids resulting from reduced river flows downstream of the proposed Project diversion points were not analyzed or disclosed in the quantification of net benefits. Third, SALMOD inputs and assumptions were not explained. Fourth, SALMOD inputs were higher than recent data indicate.

In the appeal material, the applicant provided revised SALMOD inputs that considered more recent starting populations, additional information on SALMOD assumptions, an OBAN analysis (a life cycle model for winter-run salmon), and a flow survival-effects analysis to generate a mechanism for calculating flow-related impacts associated with the Project's operations.

The results of the applicant's net benefits analysis are shown in Table A.1-5 in Attachment A to the appeal material.<sup>1</sup> The results indicate that there are net impacts to fall-run Chinook salmon under 2015 climate conditions and to spring-run Chinook salmon under 2030 climate conditions. Net impacts that could occur in the near future as a result of the Project could cause impacts that would not be offset by potentially beneficial conditions in the long-term.

The Department finds that the SALMOD assumptions and revised inputs provided in the appeal are reasonably explained and reflective of more recent and accurate data sets. However, the Department's concerns about the use of SALMOD to calculate the number of fish that will benefit over the life of the Project remain unresolved. As noted in the Department's comments on the application material, SALMOD treats production results separately for each year rather than compounding outcomes over

time. Each modeled year produces a change in production for each run of Chinook salmon at Red Bluff, and these yearly results are summed over the 82-year simulation period to produce a net change in salmon production levels. Because SALMOD is programmed to use the same starting numbers each year, the model is unable to account for variations in annual population levels. For example, SALMOD is unable to account for consecutive years in which a returning run contains a lower population than the preceding year. Because SALMOD does not account for annually changing population levels, there is high uncertainty in the resulting SALMOD outputs used to quantify net changes in salmon production.

In the appeal material, the applicant conducted a flow-survival effects analysis to account for the potential impacts associated with Project diversions on the Sacramento River that were identified in the Department's comments on the application. The net changes in salmon production numbers for each of the three climate scenarios were calculated by taking the salmon production numbers at Red Bluff, as calculated by SALMOD, and adjusting these outputs by the relative change in survival based on the flow-survival effects analysis. The relative change in survival was calculated using the change in flow below the Delevan intake. As fish migrate through the system, multiple factors in each section of the river can affect survival. The quantification of net benefits provided in the appeal analysis does not account for the cumulative reduction in survival in sections of the river upstream or downstream of the Delevan intake. Therefore, this flow-survival analysis does not evaluate the benefits to one life stage and impacts to other life stages. Thus, the Department is unable to make a determination regarding the claimed net benefit to all runs of Chinook salmon.

A lifecycle model could be used to evaluate these benefits and impacts. The applicant provided an analysis using the OBAN lifecycle model to simulate Sacramento River winter-run Chinook salmon population dynamics for the with- and without-project scenarios. The applicant notes that the with-project scenarios were also simulated considering an adjustment to survival downstream of Red Bluff Diversion Dam, recognizing potential effects related to reduced Sacramento River flows downstream of the Sites diversions. The applicant concluded that the results demonstrated an improvement in winter-run escapement. However, the applicant did not provide the modeling data for the OBAN analysis of winter-run Chinook salmon. Therefore, the Department cannot verify or evaluate the OBAN model outputs and conclusions presented in the appeal. Pursuant to the Technical Reference Document, reviewers must be able to verify all calculations, inputs and outputs, and information used by other models in the applicant's overall analysis. (Technical Reference, § 4.3.8.1 at p. 4-30.) Without this data, the Department cannot verify the OBAN results and is unable to substantiate the conclusion of net benefits to winter-run salmon. The appeal material did not include an analysis to link the benefits and impacts to each life stage of spring-run Chinook salmon, fall-run Chinook salmon, or late-fall-run Chinook salmon. As such, the Department is unable to verify the applicant's claimed net benefit to all runs of Chinook salmon.

The flow-survival effects analysis quantifies a change in survival at a single location downstream of the proposed Delevan intake. However, proposed Project operations would likely increase diversions at the Tehama-Colusa Canal and the Glenn-Colusa Irrigation District Main Canal, which are upstream of the Delevan intake. The appeal does not consider the potential cumulative effects that each of these diversions may have on migrating fish. Additionally, fish will likely experience decreased survival downstream of the single location below the Delevan intake due to reduced flows in the Lower Sacramento River and through the Sutter and Yolo Bypasses. These potential impacts were not considered in this analysis.

In the flow-survival effects analysis, the applicant evaluated several studies presenting flow-survival relationships. The applicant selected the relationship presented in the Iglesias<sup>2</sup> study for the purpose of

Footnote #2

swimming aquatic species.” Reviewers cannot verify whether the standard is applied for an adequate duration from the pre-processed number of no diversion days timeseries inputted in the CalSim II model.

#### Applicant Appeal

*The applicant provided supplemental information regarding the basis for the proposed pulse flow protection operation to minimize entrainment and impingement of juvenile salmonids. The applicant described the iterative approach developed to estimate the number of no diversion days and restrict diversions in CalSim II during pulse flow periods for modeling purposes and provided the modeling approach justification of the number of days of no diversions to fill Sites Reservoir.*

*“Operations modeling of the Sites Project included restrictions on diversions to limit impacts on out-migrating juvenile fish as a “surrogate” for real time monitoring and adaptive management... The majority of diversions into Sites Reservoir occur during December through March. Of those months, 44% have no diversion days in recognition of potential pulse events over the 82-year simulation period. Approximately 200 potential pulse events are protected over the 82-year simulation period with durations with an average of 3.5 no diversion days with some months having as many as 14 no diversion days.” (Appeal Letter, p. 5)*

#### Water Operations Review Response:

The additional information provided by the applicant in the appeal adequately addresses the comment regarding the basis for pulse flow protection standard. A review of the 2030 and 2070 conditions confirms that, on average, approximately 85 percent of the water diverted into Sites Reservoir occurs between December and March, which coincides with the months with the highest probability of no-diversion days. A review of the no diversion day timeseries confirms the data presented by the applicant in Table D.3-1 of the appeal documentation. The applicant acknowledged that this approach was adopted for modeling purposes and that “... project operations will be informed by real-time monitoring of fish presence and movement” (AttachD, p. D-5).

#### Comment 1.4

The applicant proposes to “augment flows in the Sacramento River between Keswick Dam and Red Bluff Diversion Dam to minimize dewatering of fall-run Chinook salmon redds... from October through March, particularly during fall months.” Review of the applicant’s CalSim II model results show that the range on long-term average change in Sacramento River flows for the months between October and March between Keswick Dam and Bend Bridge varies by 0 to 5 percent under 2030 conditions, and by -5 to 3 percent under 2070 conditions; between Bend Bridge and Red Bluff Diversion Dam varies by -3 to 1 percent under 2030 conditions, and by -5 to -2 percent under 2070 conditions. These results suggest minimal or no flow augmentation to help minimize dewatering of salmon redds.

### Applicant Appeal:

*The applicant pointed out that the Water Operations Review focused on the long-term average conditions between October and March without considering the intentional, primary benefits of providing additional water during the critical period for fall run Chinook salmon flow stability (December through February) when Shasta flows may be reduced.*

*"The use of a long-term monthly average flow during the longer October-March period obscures the challenges for flow stability for fall-run Chinook and the benefits of the Sites Project to this run... The Sites ecosystem enhancement storage account has been allocated to increase and stabilize flows in the Sacramento River below Keswick Dam to minimize dewatering of salmon redds." (Appeal Letter, p. 6)*

*"The Operations Plan defined a general window of opportunity between September and March in Above Normal, Below Normal, and Dry years for water to be released from Shasta Lake to stabilize flows in the Sacramento River when flows are between 3,250 to 5,500 cfs. This window of opportunity defined in the Operations Plan was based on current conditions. The quantification of benefits is based on modeling results under WSIP 2030 and 2070 climate conditions, and modeling analyses indicate that under future climate conditions the primary benefits of this action occur between December and February." (AttachD, p. D-10)*

### Water Operations Review Response:

Reviewers revised the analysis of the Sacramento River flows below Keswick Dam by reducing the time window for the flow augmentation benefits from October through March to December through February, and focusing on the Below Normal, Dry, and Critical water years instead of the long-term averages. Reviewers confirmed there is flow increase in the Sacramento River below Keswick Dam between December and February in Below Normal, Dry, and Critical water years. The results of the analysis show that flows in the Sacramento River below Keswick Dam between December and February exceed the without-project condition 40 to 50 percent of the time under 2030 conditions and 25 to 40 percent of the time under 2070 conditions, resulting in increase in average December through February flow by 16 TAF (7 percent) and 14 TAF (6 percent), respectively. Under 2030 conditions, the average December through February flow increases by 10 TAF (4 percent), 29 TAF (12 percent), and 9 TAF (4 percent) for Below Normal, Dry, and Critical water years, respectively. Under 2070 conditions, the average monthly flow between December and February increases by 13TAF (4 percent), 14 TAF (6 percent), and 16 TAF (8 percent) for Below Normal, Dry, and Critical water years, respectively.

### Comment 1.5

The applicant proposes to improve the coldwater pool storage in Lake Oroville to improve water temperature suitability for anadromous fish in the lower Feather River from May through November during all water years. Review of the applicant's CalSim II model results show that

## Footnote #3

## Comment 2: HEC-5Q and CE-QUAL-W2 Model Review

The applicant states that the project would “increase cold-water pool storage in Shasta Lake, Lake Oroville, and Folsom Lake and improve temperature in the Sacramento and American Rivers during certain months at specific compliance points...” A review of the applicant’s HEC-5Q model results shows minimal water temperature reduction in the upper Sacramento River.

### Applicant Appeal:

*The applicant pointed out that the Water Operations Review focused on long-term average conditions while not addressing the intentional, primary water temperature benefits of the Sites Project in Dry and Critical year types.*

*“The review focused on long-term average conditions while not addressing the intentional, primary benefits of the Sites Project in dry and critical year types. Existing operations provide compliant conditions but have important challenges in dryer periods.” (Appeal Letter, p. 15)*

*The applicant provided supplemental water temperature results for the average July to September water temperature for long-term, Dry, and Critical years at the four important Sacramento River temperature locations (Bonnyview, Balls Ferry, Jellys Ferry, and Bend Bridge) for the 2015, 2030, and 2070 conditions. (AttachD, p. 23-25)*

### Water Operations Review Response:

The additional information provided by the applicant in the appeal adequately addresses the comment. Reviewers reviewed the supplemental HEC-5Q model data focusing on Dry and Critical years for the 2030 and 2070 conditions provided by the applicant in the appeal (Attachment D, p.23-25). Reviewers confirmed the long-term Dry and Critical years monthly average (July to September) temperature for the four Sacramento River temperature locations (i.e., Bonnyville, Balls Ferry, Jellys Ferry, and Bend Bridge) for the Current (2015), 2030, and 2070 with- and without-project conditions match the HEC-5Q model output provided in the application. For current (2015) conditions, Dry years show a decrease in average July to September temperatures at all locations of about 0.6°F and in Critical years, average July to September temperatures are decreased by about 1.2°F to 1.4°F. For 2030 conditions, Dry years show a decrease in average July to September temperatures at all locations of about 0.2°F to 0.3°F and in Critical years, average July to September temperatures are decreased by about 0.6°F. For 2070 conditions, Dry years show a decrease in average July to September temperatures at all locations of about 0.5°F to 0.65°F and in Critical years, average July to September temperatures are decreased by about 1.44°F to 1.8°F.

## Comment 3: DSM2 Model Review

The applicant states that upstream release actions improve water quality by augmenting Delta inflows and outflows. The Delta water quality could be improved for up to 6 months from July to December in Above Normal, Below Normal, and Dry water years. Review of DSM2 results shows



May 2, 2018

TO: California Water Commission Board Members

Subject: Proposed solution to the PBR discussion regarding the Sites Project

I appreciated the opportunity to discuss the Sites Project with the Commission at your meeting on May 1. The Commission was unable to reach a decision on the project's proposed anadromous fish benefits. I want to take this opportunity to offer you a solution to the quandary created by the lack of a collaborative process to resolve differing interpretations of the current science that were discussed on Monday.

**Requested Commission Action:**

1. The Commission should use its discretion to independently find that there is sufficient information to recognize the anadromous fish benefits along with sufficient protections in the permitting process to manage the impacts to levels that ensure a measurable net to anadromous fish benefit remains.
2. The economic value placed on that benefit should be between the CWC staff assumption based on taking large amounts of land out of production and that provided by the applicant based on the WSIP unit values in the Technical Reference. We propose a placeholder of \$560 Million be used in the PBR calculation to move the process forward. This equates to a 35% survival rate of salmon produced by the Sites Project which we valued at \$1,616 Million as presented in our February 23, 2018 appeal<sup>1</sup>; which equates to a PBR of 1.07.

**Supporting Facts:**

1. **There is no debate that the Sites Project provides flow stabilization and water temperature benefits on the upper Sacramento River.**  
These benefits were recognized and confirmed by DWR in its analysis of the CalSim and HEC-5Q modeling results provided by the Sites Project.
2. **Benefits to juvenile salmon are dependent upon application of the current state of the science.**

The SALMOD model results indicate increases in dry and critical years to all runs of salmon species in the upper river. To help address scientific uncertainty we

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<sup>1</sup> 35% is lower than the most-conservative flow-survival curve as shown in Figure A.2-6 of Appendix A of our February 23, 2018 appeal letter. It is lower than the value discussed by CDFW at the May 1, 2018 meeting.



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used the best available science to quantify these downstream impacts by adjusting the SALMOD results.

In addition, we also evaluated the Sites Project using an available life cycle model for winter-run Chinook salmon. We are very disappointed that this model was not reviewed simply because the CDFW technical reviewers were not able to see the inputs, which the operations technical reviewers were able to evaluate.

**3. While there may be uncertainty regarding downstream impacts to salmon from filling Sites reservoir there is certainty that without Sites there will be further degradation of salmonid populations.**

The climate change forecasts show that if we do nothing, salmon species will continue to decline. Our analysis indicate that the Sites Project is an important tool to aid salmon population stabilization and recovery. The evaluation of the available life-cycle model results should not be discarded.

**4. A recognized public benefit for anadromous fish is a primary focus for the Sites Project's participating agencies.**

Our project participants are motivated and committed to providing the state with a block of dedicated water for the environment, specifically the benefits the Sites Project can provide to salmon.

It would be a shame to have spent decades on this, the largest of the storage projects in front the Water Commission with the most water dedicated to public benefits, to lose the opportunity to secure a dedicated block of water for environmental uses and to address our water management challenges for generations to come.

I hope this is helpful in Thursday's deliberations. Please contact Jim Watson if you have any questions.

A handwritten signature in black ink that reads 'Fritz Durst'.

Fritz Durst  
Chair, Sites Project Authority



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**From:** Alicia Forsythe [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=A6CDF06A7E904B65BAA21702A82AD329-AFORSYTHE]  
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**CC:** Janis Offermann (Janis@Horizonh2o.com) [janis@horizonh2o.com]; Falke, Mariko@DWR [Mariko.Falke@water.ca.gov]; Cross, Barbara@DWR [Barbara.Cross@water.ca.gov]  
**Subject:** RE: Sites Project - Working with Tribes Training  
**Attachments:** RDEIR-SDEIS - Ch23 - Tribal Cultural Resources.pdf; AB 52 tracking\_comprehensive list\_02\_15\_2022.docx; 2-1\_Alt 1&3.pdf; 2-2\_Alt 1&3.pdf

Wonderful Anecita! I am excited for this training!

Below are answers to your questions.

Will this be in person? On line? Hybrid? – I think on-line would be best for us. We can also make this in person if you'd like/think that might be more effective. But we have a few participants in Southern California, so in person would require more logistics. Do you all have a preference?

How many participants? – I think about a dozen or so. I'd like the project leadership team, a few of our consultants who will be helping us, and then the Sites Working Group members (this would be 2 to 4 of our Board members). There is a lot of interest in this topic from our team, so this may generate more participants, but I do want to make sure that I keep a comfortable and safe environment for our Working Group members and those more frequently working with tribes to ask questions.

Will it be recorded? – No. I don't see any need to record it and feel like not recording it would make participants feel more comfortable asking questions that they may not otherwise ask.

I've attached our RDEIR/SDEIS chapter that has some background on our consultation. I've also attached some figures from the EIR/EIS.

I've attached a consultation log that we have been keeping. It's a little out of date as it was last updated in February of this year, but I think it gives a good sense of our coordination with Tribes. (Janis, let me know if there is something else that you think would be good to send onto this group also).

We have 5 tribes that have had traditional territories in the Project footprint that we are inviting to be part of the Working Group --

Cachil Dehe Band of Wintun Indians  
Yocha Dehe Wintun Nation  
Cortina Indian Rancheria  
Grindstone Indian Rancheria  
Paskenta Band of Nomlaki Indians

Should I work with our group to get some possible dates/times for this training? I am thinking early to mid-August timeframe and could get you a handful of dates/times so that you and your team can see what fits for your schedule and we can get this on the calendar. And then maybe I can chat with whomever will be doing the training a little before to just answer any questions or share any thing that the group wanted to understand more about specifically.

I am really looking forward to this!

Ali

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Alicia Forsythe | Environmental Planning and Permitting Manager | Sites Project Authority | 916.880.0676 |  
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**From:** Agustinez, Anecita S.@DWR <[Anecita.Agustinez@water.ca.gov](mailto:Anecita.Agustinez@water.ca.gov)>  
**Sent:** Thursday, July 7, 2022 8:40 AM  
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**Subject:** RE: Sites Project - Working with Tribes Training

Hello Alicia, yes, DWRs Office of Tribal Policy Advisor will be happy to provide a training. Please keep Mariko and Barbara on future emails regarding the training coordination.

In reference to the training, here are some initial questions: Will this be in person? On line? Hybrid? How many participants? Will it be recorded?

In the interim, if you can share the consultation and communication log. My colleagues are considered "confidential" employees when it comes to the consultation logs and the information contained therein will remain confidential. I would like an idea of the history of outreach, the area of jurisdiction and a map of the project area.

Thank you, and looking forward to working with you. I do appreciate you reaching out and requesting this assistance.

~Anecita

Anecita Agustinez  
Tribal Policy Advisor  
Executive Division  
Department of Water Resources  
Cell 916.216.8637

---

**From:** Alicia Forsythe <[aforsythe@sitesproject.org](mailto:aforsythe@sitesproject.org)>  
**Sent:** Thursday, July 7, 2022 7:16 AM  
**To:** Agustinez, Anecita S.@DWR <[Anecita.Agustinez@water.ca.gov](mailto:Anecita.Agustinez@water.ca.gov)>  
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**Subject:** Sites Project - Working with Tribes Training

You don't often get email from [aforsythe@sitesproject.org](mailto:aforsythe@sitesproject.org). [Learn why this is important](#)

s relationships with Tribes. We are creating a Tribal Working Group comprised of the Tribes with traditional territories in the Project footprint. The Working Group will also include some of our Board members. We really want to engage with the local Tribes more to address concerns and also to see how we can formulate actions and activities that incorporate their cultural and traditional practices into Project components, recreation areas or mitigation areas and possibly provide job opportunities to tribal members / contracts to Tribal organizations.

Our first working group meeting is tentatively scheduled for early September.

I would like to get the group a little training prior to the first meeting so they understand Tribes better, how to appropriately show respect to the Tribe and the Tribal members, and so that we don't inadvertently do or say something that might be offensive or off putting to the Tribes. I am not sure that all of our group has worked with Tribes before. So I just want to make sure that we don't inadvertently get off on the wrong foot with the Tribes.

Would you be able to provide the group this training or know/suggest someone who would? I am thinking of training in the early to mid-August timeframe so we have a few weeks before our first meeting in early September.

Ali

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# Chapter 23 Tribal Cultural Resources

## 23.1 Introduction

This chapter describes the environmental setting, methods of analysis, and impact analysis for tribal cultural resources in the study area that would potentially be affected by the construction and operation of the Project.

California Assembly Bill 52 (AB 52) established that a project with an effect that may cause a substantial adverse change in the significance of a tribal cultural resource is a project that may have a significant effect on the environment. A tribal cultural resource is defined as a site, feature, place, cultural landscape, sacred place or object with cultural value to a California Native American Tribe. This may include an archaeological or ethnographic site, geographical location, or natural feature that is associated with the cultural practices or beliefs of a living community that are rooted in that community's history, and that are essential in maintaining the continuing cultural identity of the community. To be considered a tribal cultural resource for CEQA purposes, such sites must be included in or eligible for listing in either the California Register of Historical Resources (CRHR) or a local register of historical resources. A lead agency may also apply the CRHR eligibility criteria to determine, based on substantial evidence, that a tribal cultural resource exists.

California AB 52 also established a detailed, stepwise process for lead agency consultation with California Native American Tribes that are traditionally and culturally affiliated with the geographic area of a proposed project. The Authority's AB 52 consultation efforts are discussed in Section 23.3, *Methods of Analysis*. For a more complete description of AB 52 and the regulatory framework for tribal cultural resources, see Appendix 4A, *Regulatory Requirements*.

The study area for tribal cultural resources consists of areas of Colusa, Glenn, Tehama, Yolo, Shasta, Butte, Sutter, Yuba, and Sacramento Counties, including water bodies, that could be affected by Project construction or operations (Figure 1-1). As described in Chapter 2, *Project Description and Alternatives*, the Project would not affect or result in changes in the operation of the CVP, Trinity River Division facilities (including Clear Creek) and thus Trinity River resources are not discussed or analyzed further in this chapter.

Tables 23-1a and 23-1b summarize the CEQA tribal cultural resources impact determinations for construction and operation impacts based on each alternative. No NEPA conclusions are included because analysis of tribal cultural resources as defined for this chapter is a State-only requirement under CEQA. Resources that may be important to California Native American Tribes, such as archaeological resources that may also be tribal cultural resources, are analyzed for the purposes of CEQA and NEPA in Chapter 22, *Cultural Resources*.

**Table 23-1a. Summary of Construction Impacts and Mitigation Measures for Tribal Cultural Resources**

Alternative	Level of Significance Before Mitigation	Mitigation Measures	Level of Significance After Mitigation
Impact TCR-1: Substantial adverse change in the significance of a tribal cultural resource that is listed or eligible for listing in the California Register of Historical Resources or other local register or that the lead agency has determined to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1.			
No Project	NI	-	NI
Alternative 1	S	<p><b>Mitigation Measure TCR-1.1:</b> Implement Mitigation Measures Recommended in Public Resources Code Section 21084.3 to Avoid Damaging Effects on Tribal Cultural Resources</p> <p><b>Mitigation Measure TCR-1.2:</b> Tribal Monitoring</p> <p><b>Mitigation Measure TCR-1.3:</b> Implement Agreed-Upon Protocol for the Treatment of Human Remains and Cultural Items</p> <p><b>Mitigation Measure CUL-2.1:</b> Identify Significant Archaeological Resources</p> <p><b>Mitigation Measure CUL-2.2:</b> Avoid Significant Archaeological Resources</p> <p><b>Mitigation Measure CUL-2.3:</b> Protect Significant Archaeological Resources</p> <p><b>Mitigation Measure CUL-2.4:</b> Significant Archaeological Resources Treatment</p> <p><b>Mitigation Measure CUL-3.1:</b> Cemetery Relocation Procedure</p> <p><b>Mitigation Measure CUL-3.2:</b> Avoid, Protect, and Treat Human Burials</p>	SU

Alternative	Level of Significance Before Mitigation	Mitigation Measures	Level of Significance After Mitigation
Alternative 2	S	<p><b>Mitigation Measure TCR-1.1:</b> Implement Mitigation Measures Recommended in Public Resources Code Section 21084.3 to Avoid Damaging Effects on Tribal Cultural Resources</p> <p><b>Mitigation Measure TCR-1.2:</b> Tribal Monitoring</p> <p><b>Mitigation Measure TCR-1.3:</b> Implement Agreed-Upon Protocol for the Treatment of Human Remains and Cultural Items</p> <p><b>Mitigation Measure CUL-2.1:</b> Identify Significant Archaeological Resources</p> <p><b>Mitigation Measure CUL-2.2:</b> Avoid Significant Archaeological Resources</p> <p><b>Mitigation Measure CUL-2.3:</b> Protect Significant Archaeological Resources</p> <p><b>Mitigation Measure CUL-2.4:</b> Significant Archaeological Resources Treatment</p> <p><b>Mitigation Measure CUL-3.1:</b> Cemetery Relocation Procedure</p> <p><b>Mitigation Measure CUL-3.2:</b> Avoid, Protect, and Treat Human Burials</p>	SU
Alternative 3	S	<p><b>Mitigation Measure TCR-1.1:</b> Implement Mitigation Measures Recommended in Public Resources Code Section 21084.3 to Avoid Damaging Effects on Tribal Cultural Resources</p> <p><b>Mitigation Measure TCR-1.2:</b> Tribal Monitoring</p> <p><b>Mitigation Measure TCR-1.3:</b> Implement Agreed-Upon Protocol for the Treatment of Human Remains and Cultural Items</p> <p><b>Mitigation Measure CUL-2.1:</b> Identify Significant Archaeological Resources</p> <p><b>Mitigation Measure CUL-2.2:</b> Avoid Significant Archaeological Resources</p> <p><b>Mitigation Measure CUL-2.3:</b> Protect Significant Archaeological Resources</p> <p><b>Mitigation Measure CUL-2.4:</b> Significant Archaeological Resources Treatment</p> <p><b>Mitigation Measure CUL-3.1:</b> Cemetery Relocation Procedure</p> <p><b>Mitigation Measure CUL-3.2:</b> Avoid, Protect, and Treat Human Burials</p>	SU

Notes:

NI = CEQA no impact  
 S = CEQA significant impact  
 SU = CEQA significant and unavoidable

**Table 23-1b. Summary of Operations Impacts and Mitigation Measures for Tribal and Cultural Resources**

Alternative	Level of Significance Before Mitigation	Mitigation Measures	Level of Significance After Mitigation
Impact TCR-1: Substantial adverse change in the significance of a tribal cultural resource that is listed or eligible for listing in the California Register of Historical Resources or other local register or that the lead agency has determined to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1.			
No Project	NI	-	NI
Alternative 1	S	<p><b>Mitigation Measure TCR-1.1:</b> Implement Mitigation Measures Recommended in Public Resources Code Section 21084.3 to Avoid Damaging Effects on Tribal Cultural Resources</p> <p><b>Mitigation Measure TCR-1.2:</b> Tribal Monitoring</p> <p><b>Mitigation Measure TCR-1.3:</b> Implement Agreed-Upon Protocol for the Treatment of Human Remains and Cultural Items</p> <p><b>Mitigation Measure FISH-2.1:</b> Wilkins Slough Flow Protection Criteria</p> <p><b>Mitigation Measure CUL-2.1:</b> Identify Significant Archaeological Resources</p> <p><b>Mitigation Measure CUL-2.2:</b> Avoid Significant Archaeological Resources</p> <p><b>Mitigation Measure CUL-2.3:</b> Protect Significant Archaeological Resources</p> <p><b>Mitigation Measure CUL-2.4:</b> Significant Archaeological Resources Treatment</p> <p><b>Mitigation Measure CUL-3.1:</b> Cemetery Relocation Procedure</p> <p><b>Mitigation Measure CUL-3.2:</b> Avoid, Protect, and Treat Human Burials</p>	SU
Alternative 2	S	<p><b>Mitigation Measure TCR-1.1:</b> Implement Mitigation Measures Recommended in Public Resources Code Section 21084.3 to Avoid Damaging Effects on Tribal Cultural Resources</p> <p><b>Mitigation Measure TCR-1.2:</b> Tribal Monitoring</p> <p><b>Mitigation Measure TCR-1.3:</b> Implement Agreed-Upon Protocol for the Treatment of Human Remains and Cultural Items</p>	SU

Alternative	Level of Significance Before Mitigation	Mitigation Measures	Level of Significance After Mitigation
		<p><b>Mitigation Measure FISH-2.1:</b> Wilkins Slough Flow Protection Criteria</p> <p><b>Mitigation Measure CUL-2.1:</b> Identify Significant Archaeological Resources</p> <p><b>Mitigation Measure CUL-2.2:</b> Avoid Significant Archaeological Resources</p> <p><b>Mitigation Measure CUL-2.3:</b> Protect Significant Archaeological Resources</p> <p><b>Mitigation Measure CUL-2.4:</b> Significant Archaeological Resources Treatment</p> <p><b>Mitigation Measure CUL-3.1:</b> Cemetery Relocation Procedure</p> <p><b>Mitigation Measure CUL-3.2:</b> Avoid, Protect, and Treat Human Burials</p>	
Alternative 3	S	<p><b>Mitigation Measure TCR-1.1:</b> Implement Mitigation Measures Recommended in Public Resources Code Section 21084.3 to Avoid Damaging Effects on Tribal Cultural Resources</p> <p><b>Mitigation Measure TCR-1.2:</b> Tribal Monitoring</p> <p><b>Mitigation Measure TCR-1.3:</b> Implement Agreed-Upon Protocol for the Treatment of Human Remains and Cultural Items</p> <p><b>Mitigation Measure FISH-2.1:</b> Wilkins Slough Flow Protection Criteria</p> <p><b>Mitigation Measure CUL-2.1:</b> Identify Significant Archaeological Resources</p> <p><b>Mitigation Measure CUL-2.2:</b> Avoid Significant Archaeological Resources</p> <p><b>Mitigation Measure CUL-2.3:</b> Protect Significant Archaeological Resources</p> <p><b>Mitigation Measure CUL-2.4:</b> Significant Archaeological Resources Treatment</p> <p><b>Mitigation Measure CUL-3.1:</b> Cemetery Relocation Procedure</p> <p><b>Mitigation Measure CUL-3.2:</b> Avoid, Protect, and Treat Human Burials</p>	SU

Notes:

NI = CEQA no impact

S = CEQA significant impact

SU = CEQA significant and unavoidable

## 23.2 Environmental Setting

The area that would be affected by Project operations involves nearly all of the Sacramento Valley from Redding in the north through the Yolo Bypass in the south, with a focus on the major rivers (i.e., Sacramento, Feather, and American Rivers) that flow into the valley. The rivers supported abundant fisheries (especially salmon), and sustained the vast grasslands of the valley that provided habitat for herds of elk and antelope, and allowed for the growth of dense valley oak woodlands. Indigenous California populations favored the Sacramento Valley due to the richness of the resources found there and a large number of tribes who spoke different languages lived in the region at the time of Euro-American exploration and colonization.

The Project construction footprint is located in part of the traditional tribal territory of the northern Patwin and Nomlaki people, who lived in permanent villages in the hills and along the waterways in a large territory west of the Sacramento River and extending as far as Suisun and San Pablo Bays (Knudtson 1977:14; Sites Project Authority and Reclamation 2017:18-15). Population density in this region was one of the highest in the state. The Patwin and Nomlaki are both linguistically classified as part of the Wintuan family of the Penutian language stock. Wintuan is separated linguistically and culturally into three major groups from north to south: the Wintu, Nomlaki, and Patwin. The Patwin and Nomlaki groups shared many cultural characteristics (White et al. 2009:15; Sites Project Authority and Reclamation 2017:18-15).

The Patwin and Nomlaki of the study area could be divided into “hill people” and “river people,” who organized themselves into sociopolitical units that were called “tribelets” by early ethnographers. Each tribelet controlled and defended a well-defined territory recognized by adjoining communities. Each group built a dancehouse that served as a spiritual and ceremonial center. Acorn granaries were another significant element of Patwin and Nomlaki villages, attesting to the importance of that staple food item (Goldschmidt 1978:347; White et al. 2009:15–16, 20). The people lived well hunting and gathering the territory’s abundant plant, game, and fish resources until the arrival of European and Euro-Americans during the eighteenth and nineteenth centuries. Acorns were supplemented with deer, a variety of fish, birds, berries, grubs, worms, seeds, bulbs, and wild honey. The people traded with neighboring tribes for goods that could not be made or obtained in their own territories (Sites Project Authority and Reclamation 2017:18-15). The dense marshlands from the foot of the Sutter Buttes to the Delta in the south provided the Patwin with abundant materials for weaving, which they traded to other tribes or made into exceptionally strong and distinctive baskets. The river Patwin traveled the rivers and streams in boats made from bundles of tule reeds (Eargle 2000:135). Further information on early Native Americans is provided in Chapter 22, *Cultural Resources*. The arrival of the Spanish missions, miners, trappers, homesteaders, and ranchers, and the violence and disease they brought decimated the native people’s numbers and disrupted their lifeways (White et al. 2009:31–41).

Present-day descendants of the Patwin and Nomlaki people continue to live in or near the study area. They are represented by the Yocha Dehe Wintun Nation (Yocha Dehe), Cachil Dehe Band of Wintun Indians (Colusa Indian Community), Kletsel (Cortina) Band of Wintun Indians, Grindstone Indian Rancheria of Wintun-Wailaki Indians, and Paskenta Band of Nomlaki Indians.

A number of other tribes are present along those portions of the Sacramento, Feather, and American Rivers that would be affected by Project operations that would involve regulation of water releases in the rivers, although the Project would not directly encroach on their lands. At the far north end of the Project area along the Sacramento River, the Wintu occupied both sides of the river. As previously mentioned, the Wintu are linguistically and culturally closely related to the Patwin and Nomlaki. In the present day, the Wintu in the Project area are represented by the Wintu Tribe of Northern California and Redding Rancheria.

Below the Wintu and Nomlaki lands, portions of the Sacramento River were traditionally held by Maiduan-speaking tribes. The Mechoopda Indian Tribe and the Estom Yumeka Maidu Tribe of the Enterprise Rancheria, both Konkow Maidu Tribes, are close neighbors who have ancestral territory along both sides of the Sacramento River in the southeast corner of Tehama County and the northwest corner of Colusa County. The Konkow Maidu also have ancestral lands that encompass the Feather River below Oroville Dam in Butte County. The Mechoopda Indian Tribe and Estom Yumeka Maidu Tribe of the Enterprise Rancheria, along with the Konkow Valley Band of Miwok, represent the Konkow Maidu in this area. Konkow Maidu Tribes who lived along the rivers shared many of the same subsistence practices with the Patwin and Nomlaki, as they lived in the same or similar environment.

The lower portion of the Sacramento River below about Knights Landing, including the Yolo Bypass, Feather River above its confluence with the Sacramento River, and the American River between Folsom Dam and the Sacramento River, is within the ancestral territory of the Nisenan. The Nisenan language is of the Maiduan language family and is therefore closely related to the Konkow Maidu language. The Nisenan also shared many cultural traits with their Konkow Maidu neighbors. Nisenan descendants in the Project area are represented by the United Auburn Indian Community of the Auburn Rancheria.

The southern end of Project operations along the Sacramento River and in the Yolo Bypass is the ancestral home of the Plains Miwok, who also occupied the northern portions of the Sacramento-San Joaquin Delta. The Plains Miwok are one of many Miwokan-speaking Tribes who once inhabited territory across California from the Pacific Ocean to the crest of the Sierra Nevada mountains. Present-day Plains Miwok descendants are found among the Shingle Springs Band of Miwok Indians, Lone Band of Miwok Indians, and the Wilton Rancheria.

All of the Native American communities referenced above continue to have strong ties to their ancestral lands and have the potential to identify tribal cultural resources within the Project construction and operating areas. To date, only the Yocha Dehe and Cachil Dehe, described in greater detail below, have requested consultation on this Project under California AB 52.

### **23.2.1. Yocha Dehe Wintun Nation**

Yocha Dehe Wintun Nation is a federally recognized tribe and sovereign tribal government. They currently occupy part of their historic territory in Yolo County (Yocha Dehe n.d.a), with Tribal headquarters in Brooks. In their native language, Yocha Dehe means “home by the spring water,” a description of where their ancestors lived, where their people come from, and who they are as a Tribe. This homeland is the Capay Valley and the watershed of Cache Creek, which, in

their own words, "... gave us precious materials, nourishment, and spiritual well-being. The oak tree gave us food, shelter, and strength" (Yocha Dehe 2015:2).

Nineteenth-century Euro-American settlement and U.S. federal policy in 1908 moved the Tribe onto a small reservation in Rumsey, where they struggled to subsist on the poor land and became known as the Rumsey Band of Wintun Indians (Yocha Dehe 2015:4). In 1940, the federal government relocated the Tribe elsewhere in the Capay Valley, where the Tribe was able to farm on 188 acres of trust land. During the 1980s, the Tribe seized opportunities for tribal economic development created by the federal Indian Gaming Regulatory Act and the California Lottery by opening a bingo hall (Yocha Dehe 2015:6).

The bingo hall developed into the Cache Creek Casino Resort, the largest private employer in Yolo County. Other Tribal enterprises include the Yocha Dehe Golf Club and agriculture. The Tribe farms more than a dozen crops on 2,200 acres, of which 250 are certified organic; runs more than 400 head of cattle; and has more than 1,200 acres of Tribal land in conservation easements (Yocha Dehe n.d.b; Yocha Dehe 2015:14). The Tribe also markets its own brand of wine, extra virgin olive oil, wildflower honey, and organic produce; the olive oil mill also serves other regional growers. Yocha Dehe businesses support education, cultural and environmental stewardship, philanthropy, and community service (Yocha Dehe 2015:16, 18).

### **23.2.2. Cachil Dehe Band of Wintun Indians (Colusa Indian Community)**

The U.S. Bureau of Indian Affairs recognizes the Cachil Dehe Band of Wintun Indians of the Colusa Indian Community of the Colusa Rancheria, California (U.S. Bureau of Indian Affairs, n.d.). On November 23, 1941, the 45 members of the Cachil Dehe adopted a constitution and bylaws. In 1943, the Tribe acquired another 210 acres 1 mile south of their original 80-acre reservation along the Sacramento River near the city of Colusa. This land became the site of the present day Cachil Dehe Village Complex and Colusa Casino (Colusa Indian Community 2020a).

Consisting of approximately 84 members in the present day, the Colusa Indian Community has prospered while preserving its members' past and culture. The community spent years building a traditional roundhouse that is the center of traditional spiritual practice. Tribal elders collaborated with the University of California Berkeley linguistics department to publish a first edition of a Cachil Dehe language book as part of an ongoing language preservation project (Colusa Indian Community 2020a).

The Tribe operates the Colusa Casino Resort, which supports Tribal government programs, infrastructure, and Tribal and community economic development. For instance, casino profits fund the Colusa Indian Community Health Clinic, which was originally intended as a resource for Tribal members but now serves the greater Colusa County community. Their wellness center and daycare facility are also open to the public. Casino profits also help fund acquisition of farmland (Colusa Indian Community 2020b). The Tribe farms over 4,000 acres of tree, grain, and field crops, more than half of which are planted in rice. The Tribe also owns a share in a rice drying facility in Maxwell, California, where it dries its rice for market (Colusa Indian Community 2020c). Another Tribal business offers guided hunting and fishing adventures in the rangelands of the Colusa County foothills, on the Sacramento River, and in the flooded grain

fields and natural marshes of the northern Sacramento Valley (CICC Outdoor Adventures 2015a, 2015b, and 2015c).

### 23.3 Methods of Analysis

This section describes the Authority's method of analysis for potential impacts to tribal cultural resources. A key input to the identification of tribal cultural resources is the perspective of California Native American Tribes that are traditionally and culturally affiliated with the Project area. The Project team has been meeting with interested California Native American Tribes at various intervals beginning in 2002, as the Project concept evolved from the late-1990s North-of-Delta Offstream Storage (NODOS) to the Project being evaluated in this RDEIR/SDEIS. Chapter 22, *Cultural Resources*, describes additional past and current efforts conducted to identify study area archaeological resources, including those that may also be important to California Native American Tribes.

In 2010 (i.e., prior to the passage of AB 52) the Cortina Band of Wintun Indians submitted a report expressing its concerns about NODOS. The report included a recommendation that the Cortina Band of Wintun Indians be consulted at all phases and, in particular, when the need arose "for site testing, borings, and soil column samplings..." and regarding biological mitigation and enhancements that could affect natural resources used in traditional cultural practices (Cortina Band of Wintun Indians 2010).

With the passage of AB 52, California Native American Tribes were encouraged to notify local agencies of their desire to be notified of proposed projects in the geographic area that is traditionally and culturally affiliated with the tribe. On January 3, 2017, The Cachil Dehe Band of Wintun Indians submitted to the Authority a written request for formal notice of and information on proposed projects for which the Authority will serve as lead CEQA agency. No other tribes contacted the Authority to request notification of proposed projects.

On January 27, 2017, the Authority contacted the California Native American Heritage Commission (NAHC) to request a list of tribes that have a traditional and cultural affiliation with the geographic area of the Project. The NAHC provided the Authority with a list of seven Tribes with traditional lands or cultural places located within the geographic area of the Project. In February 2017, the Authority sent Project notification letters to the seven Tribes identified by the NAHC: the Cachil Dehe Band of Wintun Indians; Cortina Indian Rancheria of Wintun Indians; Grindstone Indian Rancheria of Wintun-Wailaki; Yocha Dehe Wintun Nation; Paskenta Band of Nomlaki Indians; Mechoopda Indian Tribe; and Estom Yumeka Maidu Tribe of the Enterprise Rancheria. One Tribe, the Cachil Dehe Band of Wintun Indians, requested consultation, and the Authority first met with Tribal representatives on July 12, 2017. Separately, the Yocha Dehe contacted Authority staff on May 19, 2017, for information, which the Authority provided on June 22, 2017. No other Tribes requested consultation under AB 52. The contacted Tribes did not identify any potentially affected tribal cultural resources during this period.

In February 2019, the Authority provided notice to the Yocha Dehe, Cachil Dehe, and Cortina Indian Rancheria regarding the Authority's efforts to update the geotechnical investigations for

the Project. The Cortina did not respond, but the Yocha Dehe and Cachil Dehe requested consultation under AB 52. The Authority met with the Yocha Dehe and Cachil Dehe individually to discuss the geotechnical investigations, as well as the overall status of the Project. Yocha Dehe followed up by emailing the Tribe's *Treatment Protocol for Handling Human Remains and Cultural Items Affiliated with the Yocha Dehe Wintun Nation*, should any be discovered, on July 1, 2019. The Cachil Dehe then provided Tribal monitors for the work.

In the summer and fall of 2020, the Authority again contacted the Yocha Dehe and Cachil Dehe tribes to provide information related to Project refinements. The Authority held a number of calls and meetings, and shared geographic information system data with the Yocha Dehe and Cachil Dehe during this time. The Authority held meetings with the Yocha Dehe in June and October 2020. The Authority provided updated Project information to Cachil Dehe and had a conference call with Cachil Dehe Tribal representatives in October 2020. In addition to these outreach and consultation efforts, on November 14, 2020, the Authority mailed AB 52 notification letters to all seven of the Tribes that the NAHC had previously identified to the Authority as traditionally and culturally affiliated with the Project area. The notification concerned the Authority's decision to recirculate the EIR to address modifications to the Project (e.g., elimination of the Delevan Pipeline and addition of the Dunnigan Pipeline). The notification letter also included the revised Project description.

In response to the Authority's November 2020 letter, the Yocha Dehe responded in a letter dated November 19, 2020, in which they requested a site visit. A site visit was conducted on January 11, 2021, which included Tribal representatives. The Authority provided Yocha Dehe with an updated Project description via email on March 15, 2021. Additionally, the Cachil Dehe requested continued consultation on the Project via email on December 7, 2020, and were provided an updated Project description on March 17, 2021. None of the other Tribes that received the Authority's November 2020 outreach responded.

In June 2021, the Authority expanded outreach to tribes traditionally or culturally affiliated with locations where Project operations have the potential to change river flows as compared to current conditions. These areas include stretches of the Sacramento River from Keswick in Shasta County downstream through the Yolo Bypass in Yolo County; the Feather River from Oroville Dam to the confluence with the Sacramento River; and the American River from Folsom Dam to the confluence with the Sacramento River. Seven additional Tribes with traditional and cultural affiliation to the river reaches were identified within these areas operations: Wintu Tribe of Northern California, Redding Rancheria, Konkow Valley Band of Maidu, United Auburn Indian Community of the Auburn Rancheria, Shingle Springs Band of Miwok Indians, Ione Band of Miwok Indians, and Wilton Rancheria. The Authority sent a letter requesting input on the identification of tribal cultural resources to each of the seven Tribes on June 15, 2021. Each Tribe was contacted by email or telephone on July 8, 2021, as a follow up to the letter.

Table 23-2 summarizes AB 52 consultation and any responses from Tribes as of the preparation of this RDEIR/SDEIS and Table 23-3 identifies additional outreach performed by the Authority.

**Table 23-2. Summary of AB 52 Consultation**

<b>Tribe</b>	<b>AB 52 Notification Letters</b>	<b>Tribal Response</b>	<b>Consultation Actions to Date (7/1/2021)</b>
Cachil Dehe Band of Wintun Indians (Colusa Indian Community Council)	Sent 11/14/2020	Request for information	Prior to letter, conference call. Meetings on August 29, 2019 and October 22, 2020. Project background and updated materials provided. An updated Project description was sent March 17, 2021, and geographic information system data were subsequently provided.
Cortina Indian Rancheria of Wintun Indians	Sent 11/14/2020	None	None; no email available and tribal office phone did not take messages
Estom Yumeka Maidu Tribe of the Enterprise Rancheria	Sent 11/14/2020	None	Authority sent follow up letter via email on December 17, 2020. No response.
Grindstone Indian Rancheria of Wintun-Wailaki	Sent 11/14/2020	None	None; no email available and tribal office phone did not take messages
Mechoopda Indian Tribe	Sent 11/14/2020	None	Authority sent follow up letter via email on December 17, 2020. No response.
Paskenta Band of Nomlaki Indians	Sent 11/14/2020	None	Authority sent follow up letter via email on December 17, 2020. No response.
Yocha Dehe Wintun Nation	Sent 11/14/2020	Request to consult	Prior to letter, quarterly meetings. Meetings on June 28, 2019; June 30, 2020; and October 6, 2020. Project background and updated materials provided. Geographic information system data provided. Field visit conducted January 11, 2021. Informal phone call on June 4, 2021, discussing concerns about erosion by reservoir fluctuations and identifying burial sites at risk. Formal meeting to discuss these issues is planned for the end of July 2021.

**Table 23-3 Additional Outreach to California Native American Tribes**

<b>Tribe</b>	<b>Outreach Letter</b>	<b>Tribal Response</b>	<b>Actions to Date (7/8/2021)</b>
Ione Band of Miwok Indians	Sent 6/15/2021	None	Authority sent follow up letter via email on July 8, 2021. No response.

<b>Tribe</b>	<b>Outreach Letter</b>	<b>Tribal Response</b>	<b>Actions to Date (7/8/2021)</b>
Konkow Valley Band of Maidu	Sent 6/15/2021	None	Unsuccessful attempt to email on July 8, 2021. No email or phone number provided on website.
Redding Rancheria	Sent 6/15/2021	None	Follow up phone call on July 8, 2021, to request email address; left message on answering machine. No response.
Shingle Springs Band of Miwok Indians	Sent 6/15/2021	None	Authority sent follow up letter via email on July 8, 2021. No response.
United Auburn Indian Community of the Auburn	Sent 6/15/2021	None	Authority sent follow up letter via email on July 8, 2021. No response.
Wilton Rancheria	Sent 6/15/2021	None	Authority sent follow up letter via email on July 8, 2021. No response.
Wintu Tribe of Northern California	Sent 6/15/2021; returned to sender 6/28/2021	None	Phone call on July 8, 2021 to request email address; left message on answering machine. No response.

### **23.3.1. Construction and Operation**

Construction impacts were evaluated by understanding the potential presence of tribal cultural resources within the footprint of ground-disturbing activities associated with Project construction. A review of the Sacred Lands files by the NAHC, as well as conversations with Yocha Dehe and Cachil Dehe representatives contributed to knowledge about tribal cultural resources within the Project construction footprint. These data were augmented by information gathered during the archaeological survey, as reported in Chapter 22.

Operational impacts were evaluated by assessing the character of Project operations to understand which operating characteristics have the potential to disturb tribal cultural resources. For example, fluctuating water surface elevation (WSE) in the reservoir, TRR East and West inundation areas, and more broadly, river systems affected by Project operations, could theoretically affect tribal cultural resources by causing erosion or exposing previously unknown buried archaeological resources. Recreational activities and maintenance requirements could also affect tribal cultural resources through looting, vandalism, or ground disturbance.

### **23.3.2. Thresholds of Significance**

An impact on tribal cultural resources would be considered significant if the Project would cause a substantial adverse change in the significance of a tribal cultural resource, that is listed or eligible for listing in the CRHR or other local register or that the Authority has determined to be significant pursuant to criteria set forth in subdivision (c) of California Public Resources Code Section 5024.1.

## 23.4 Impact Analysis and Mitigation Measures

**Impact TCR-1: Substantial adverse change in the significance of a tribal cultural resource that is listed or eligible for listing in the California Register of Historical Resources or other local register or that the Authority has determined to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1.**

### *No Project*

Under the No Project Alternative, the Sites Reservoir and associated facilities would not be built. Any tribal cultural resources present in the study area would not be affected. If other projects were initiated after July 2014 and require a CEQA analysis they would have had to consult and comply with AB 52 to determine presence of and impacts on tribal cultural resources and propose mitigation in their environmental documents. If projects were initiated before July 2014, AB 52 would not apply. Activities that are presently occurring in the study area, such as ongoing agricultural activities or grazing, may have the potential to affect buried and unknown tribal cultural resources, but this potential effect is part of the environmental setting and would not change under the No Project Alternative.

### Significance Determination

The No Project Alternative would not result in a substantial adverse change on tribal cultural resources because no new Project facilities would be constructed and operated. There would be no impact/no effect.

### *Alternatives 1 and 3*

To date, consultation with California Native American Tribes traditionally and culturally affiliated with the geographic area of the Project has indicated that impacts to cemeteries and other sites, such as habitation (village) sites, with a high potential to include human remains are of great concern and should be treated with the utmost respect and dignity. Cemeteries and sensitive habitation sites have been identified in the construction area and are primarily within the inundation area. Although the sites have not been formally evaluated for inclusion in the CRHR, the Authority has determined cemeteries and habitation sites to be tribal cultural resources pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. Similarly, one potential ceremonial site has been identified within the inundation area, and others may be identified during further consultation. These site types are also considered tribal cultural resources by the Authority. Continued consultation with California Native American Tribes may identify other kinds of sites or landscapes that the Authority could determine to be tribal cultural resources. Evaluation studies of archaeological sites pursuant to Mitigation Measure CUL-2.1 in Chapter 22, may also reveal tribal cultural resources.

### Construction and Operation

Modifications to existing Sacramento River diversion facilities and conveyances to regulating reservoirs (e.g., adding new pumps in the existing RBPP and a new head gate in the existing GCID canal, upgrading GCID canal siphons, and improving the existing GCID canal road) are not expected to create new significant impacts on tribal cultural resources because these are

existing facilities and work would be done within the facility footprints or immediately adjacent in previously disturbed areas.

Constructing the Sites Reservoir, Golden Gate Dam, Sites Dam, saddle dams, saddle dikes, I/O Works, TRR East, conveyance facilities, roads, and recreation facilities would involve earthmoving and altering the landscape in the Antelope Valley and surrounding environs. Earthmoving would have the potential to disturb or destroy both surface and buried tribal cultural resources. Altering the landscape could disrupt cultural and spiritual practices. Filling the Sites Reservoir would destroy or eliminate access to any resources potentially present in the inundation area.

Operation of the reservoir could interfere with tribal cultural resources related to the Sacramento River and other affected waterbodies, such as by changes in flows that could damage, erode, or obstruct access to buried sites or traditional use sites. No substantial changes in river flows are expected (Chapter 5, *Surface Water Resources*). Flows in several rivers (e.g., Sacramento, Feather, and American Rivers) would experience changes as a result of Alternative 1 or 3. Analysis in Chapter 11, *Aquatic Biological Resources*, shows that the majority of these flows would be within the historical range experienced by the rivers and would not have significant impacts on fish that could be considered tribal cultural resources. Alternatives 1, 2, and 3 include pulse flow protection measures applied to precipitation-generated pulse flow events from October through May and a fish monitoring program to inform real-time operational adjustments to limit the potential for negative effects to juvenile salmonids (Chapter 11). Mitigation Measure FISH-2.1, Wilkins Slough Flow Protection Criteria, described in Chapter 11, will prevent Project diversions from reducing Sacramento River flow below 10,700 cubic feet per second at Wilkins Slough during March, April, and May. Mitigation Measure FISH-2.1 will limit the potential for negative flow-survival effects to winter-run Chinook salmon, spring-run Chinook salmon, fall/late fall-run Chinook salmon, and Central Valley steelhead during dispersal to rearing habitat and/or migration downstream toward the delta (Appendix 11P, *Riverine Flow-Survival*, Section 11P.2).

Modeled changes in flood flows during operations are minor when considered in the context of the larger system and would not represent a substantial increase in the amount or rate of runoff that would result in flooding or alter natural river geomorphic processes or existing geomorphic characteristics. Accordingly, potential adverse changes in erosion or quality of land or sites of religious or cultural importance to a California Native American Tribe are not expected under Alternative 1 or 3.

Chapter 22 reports that a total of 45 known California Native American archaeological resources (early Native American sites or multicomponent sites) within the inundation areas for Sites Reservoir and TRR East have the potential to be disturbed by fluctuating WSE; the Yocha Dehe have expressed concern about erosion of known burial sites in the Sites Reservoir inundation area from these fluctuations. The operation of public recreational facilities and use of security measures at on-land Project facilities could also damage or obstruct access to tribal cultural resources within facility boundaries and affect their sacred character.

CEQA Significance Determination and Mitigation Measures

Modifications to existing Sacramento River diversion facilities and conveyances to regulating reservoirs would have no impact because these facilities are already in place. Operation of Alternative 1 or 3 would generally not result in substantial changes in river flows and flows would be within the historical range experienced by the rivers; therefore, most impacts related to river flows would be less than significant. Impacts related to juvenile salmonid rearing and/or migration habitat would be limited through pulse flow protection measures applied to precipitation-generated pulse flow events from October through May, a fish monitoring program to inform real-time operational adjustments, and Mitigation Measure FISH-2.1. Accordingly, impacts on juvenile salmonids would be less than significant with mitigation incorporated under Alternative 1 or 3.

Construction of the reservoir and new facilities under Alternatives 1 and 3 would result in disturbance or destruction of tribal cultural resources. Implementing mitigation measures, such as those described below, could reduce some, but not all, impacts of construction and operation of Alternative 1 or 3 to a less-than-significant level. Mitigation Measures TCR-1.2 and TCR-1.3 reflect measures described in the *Treatment Protocol for Handling Human Remains and Cultural Items Affiliated with the Yocha Dehe Wintun Nation* and will be applied to any tribal cultural resource identified by any Tribe. Known cemeteries and habitation sites that are tribal cultural resources would be permanently altered or destroyed by inundation of the reservoir or construction of other facilities. Impacts would be significant and unavoidable.

**Mitigation Measure TCR-1.1: Implement Mitigation Measures Recommended in Public Resources Code Section 21084.3 to Avoid Damaging Effects on Tribal Cultural Resources**

- (1) Avoidance and preservation of the resources in place, including, but not limited to, planning and construction to avoid the resources and protect the cultural and natural context, or planning greenspace, parks, or other open space, to incorporate the resources with culturally appropriate protection and management criteria.
- (2) Treating the resource with culturally appropriate dignity, taking into account the tribal cultural values and meaning of the resource, including, but not limited to, the following:
  - (A) Protecting the cultural character and integrity of the resource.
  - (B) Protecting the traditional use of the resource.
  - (C) Protecting the confidentiality of the resource.
- (3) Permanent conservation easements or other interests in real property, with culturally appropriate management criteria for the purposes of preserving or utilizing the resources or places.

### **Mitigation Measure TCR-1.2: Tribal Monitoring**

Tribal monitors will be permitted to observe all ground-disturbing activities.

### **Mitigation Measure TCR-1.3: Implement Agreed-Upon Protocol for the Treatment of Human Remains and Cultural Items**

If human remains or associated grave goods are discovered during or after environmental review, the Authority will provide for the following actions:

- Immediately notify the County coroner and cease ground-disturbing activities in that location.
- The County coroner will notify the NAHC to establish the most likely descendant and contact the culturally affiliated Tribe.
- Allow the designated Tribal member(s) to inspect the site of the discovery and determine how the human remains and grave goods should be treated with appropriate dignity and respect.
- The location of a reburial will be recorded with the California Historic Resources Inventory System.
- The Authority, its contractors and consultants, and the coroner will not disclose the location of the original burial or reburial site.
- Treatment of all cultural items, including ceremonial items and archeological items will reflect the religious beliefs, customs, and practices of the culturally affiliated Tribe. All cultural items, including ceremonial items and archeological items, discovered during Project construction and operation will be turned over to the Tribe for appropriate treatment, unless otherwise ordered by a court or agency of competent jurisdiction. The Authority will waive any and all claims to ownership of Tribal ceremonial and cultural items that may be found.
- Work of Tribal monitors and treatment of human remains will proceed in accordance with treatment plans developed in consultation with the most likely descendant of the culturally affiliated Tribe as identified by the NAHC.

The following mitigation measures specified in Chapter 11, Section 11.4 and Chapter 22, Section 22.4 would also be implemented and would apply to tribal cultural resources.

**Mitigation Measure FISH-2.1: Wilkins Slough Flow Protection Criteria****Mitigation Measure CUL-2.1: Identify Significant Archaeological Resources****Mitigation Measure CUL-2.2: Avoid Significant Archaeological Resources****Mitigation Measure CUL-2.3: Protect Significant Archaeological Resources****Mitigation Measure CUL-2.4: Significant Archaeological Resources Treatment****Mitigation Measure CUL-3.1: Cemetery Relocation Procedure****Mitigation Measure CUL-3.2: Avoid, Protect, and Treat Human Burials**

If non-burial or other significant sites or cultural items are discovered, the Authority will work with the consulting Tribes to determine affiliation and develop appropriate treatment.

If unanticipated discoveries of culturally significant resources occur on federal land, the federal land manager will be immediately contacted and the federal agency will follow its own process for complying with the federal Native American Graves Protection and Repatriation Act and other federal obligations, as directed under Title 43 of Code of Federal Regulations, Part 10.

***Alternative 2***

Under Alternative 2, the reservoir would be smaller. The proposed South Road alignment would follow a drainage and the potential for impacts could be greater compared to Alternatives 1 and 3 if tribal cultural resources are identified in that area, because the South Road is not included in Alternatives 1 and 3.

The TRR West facilities under Alternative 2 would be similar to TRR East facilities under Alternatives 1 and 3, but in a different location and orientation, west of the GCID Main Canal and east of Funks Reservoir. TRR West facilities would involve inundation and surface and subsurface impacts that could affect tribal cultural resources if any are present.

Alternative 2 would also involve a 6-mile extension of Dunnigan Pipeline from the CBD outlet, traversing under agricultural fields and passing through a discharge structure at the western levee of the Sacramento River at approximately River Mile 100.8 (Figure 2-40). It would require a new gravel access road to the Sacramento River discharge. The Dunnigan Pipeline extension and discharge structure would expand the area where surface and subsurface tribal cultural resources might be found compared to Alternatives 1 and 3.

**Construction and Operation**

Tribal consultation to identify tribal cultural resources is ongoing. To date, Tribes have identified cemeteries and any locations with burials to be of concern, and the Authority has determined such sites to be tribal cultural resources. Sites with ceremonial significance are also considered tribal cultural resources. These site types are largely within the Sites Reservoir inundation area. Chapter 22 reports that a total of 45 known Native American archaeological resources (early

Native American sites or multicomponent sites) within the inundation areas have the potential to be disturbed by fluctuating WSE; the Yocha Dehe have expressed concern about erosion of known burial sites in the Sites Reservoir inundation area from these fluctuations. Due to the Tribes' traditional occupation and use of the study area for thousands of years and into the present, it is assumed that additional tribal cultural resources are present and could be located throughout the Project area. The nature of construction and operational impacts under Alternative 2 would be the same as under Alternatives 1 and 3. The magnitude of impacts under Alternative 2 may be different, depending on the location of facilities and TCRs.

#### CEQA Significance Determination and Mitigation Measures

The modifications to existing Sacramento River diversion facilities and conveyances to regulating reservoirs would be the same under Alternative 2 as those for Alternative 1 or 3; there would be no impact from modification of existing facilities. Operation of Alternative 2 would generally not result in substantial changes in river flows and flows would be within the historical range experienced by the rivers; therefore, most impacts related to river flows would be less than significant. Impacts related to juvenile salmonid rearing and/or migration habitat would be limited through pulse flow protection measures applied to precipitation-generated pulse flow events from October through May, a fish monitoring program to inform real-time operational adjustments, and Mitigation Measure FISH-2.1. Accordingly, impacts on juvenile salmonids would be less than significant with mitigation incorporated under Alternative 2.

Construction and operation impacts associated with new facilities under Alternative 2 would be significant for the same reasons as under Alternative 1 or 3. Mitigation measures such as tribal monitoring, respectful treatment of human remains, and curation or conservation of material resources could reduce some, but not all, impacts of construction and operation to a less-than-significant level. Because ultimately resources would be permanently destroyed by inundation of the reservoir or construction of other facilities, the impact would be significant and unavoidable.

Mitigation measures would be the same as under Alternatives 1 and 3.

#### **Mitigation Measure TCR-1.1: Implement Mitigation Measures Recommended in Public Resources Code Section 21084.3 to Avoid Damaging Effects on Tribal Cultural Resources**

#### **Mitigation Measure TCR-1.2: Tribal Monitoring**

#### **Mitigation Measure TCR-1.3: Implement Agreed-Upon Protocol for the Treatment of Human Remains and Cultural Items**

The following mitigation measures specified in Chapter 11 and Chapter 22 would also be implemented and would apply to tribal cultural resources.

**Mitigation Measure FISH-2.1: Wilkins Slough Flow Protection Criteria**

**Mitigation Measure CUL-2.1: Identify Significant Archaeological Resources**

**Mitigation Measure CUL-2.2: Avoid Significant Archaeological Resources**

**Mitigation Measure CUL-2.3: Protect Significant Archaeological Resources**

**Mitigation Measure CUL-2.4: Significant Archaeological Resources Treatment**

**Mitigation Measure CUL-3.1: Cemetery Relocation Procedure**

**Mitigation Measure CUL-3.2: Avoid, Protect, and Treat Human Burials**

## 23.5 References

### 23.5.1. Printed References

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[https://issuu.com/yochadehe/docs/f5\\_rw-981\\_tribal\\_brochure/10](https://issuu.com/yochadehe/docs/f5_rw-981_tribal_brochure/10).

Sites Reservoir Project  
General AB 52 Tracking Sheet

Action	Tribes	Tribal Response	Authority Response	Follow-up/Meetings	Notes
<b>Pre-2017</b>					
During the late 1990s, the Sites Reservoir Project (then known as North-of-Delta Offstream Storage, or NODOS) Study Team (composed of CALFED, California Department of Water Resources, and Reclamation) identified tribes in the Primary Study Area that could be affected by implementation of the Sites Reservoir Project: The Sites Reservoir Project Study Team met with interested tribes at various times between 2002 and 2004 (Authority and Reclamation, 2017: 18-23).	Cachil Dehe Band of Wintun Indians; Cortina Indian Rancheria of Wintun Indians; Grindstone Indian Rancheria of Wintun-Wailaki; Paskenta Band of Nomlaki Indians; Round Valley Indian Tribe of Round Valley; Wintun Tribe in Redding; Yocha Dehe Wintun Nation.				
<b>2017 Draft EIR/S</b>					
AB 52 Project Notification letter February 10, 2017  Follow-up letters sent April 7, 2017	Daniel Gomez, Chairperson Cachil Dehe Band of Wintun Indians	Letter requesting consultation was received by the Authority on February 6, 2017 (no follow-up letter sent). Oscar Serrano identified as contact	Response letter sent ca. March 6, 2017. Jim Watson identified as contact.	Authority met with tribal representatives July 12, 2017	
	Charlie Wright, Chairperson Cortina Indian Rancheria of Wintun Indians	No formal response			
	Glenda Nelson, Chairperson Estom Yumeka Maidu Tribe of the Enterprise Rancheria	No formal response			
	Ronald Kirk, Chairperson Grindstone Indian Rancheria of Wintun-Wailaki	No formal response			
	Dennis Ramirez, Chairperson Mechoopda Indian Tribe	No formal response			
	Andrew Alejandre, Chairperson Paskenta Band of Nomlaki Indians	No formal response			
	Leland Kinter, Chairperson Yocha Dehe Wintun Nation	The tribe contacted Authority staff on May 19, 2017 about project information	The Authority provided the requested information on June 22, 2017		
<b>2019 Geophysical Studies</b>					
AB 52 Project Notification letter February 15, 2019	Oscar Serrano Cachil Dehe Band of Wintun Indians	Letter requesting consultation was received by the Authority on March 4, 2019		Authority met with tribal representatives March 25, 2019 2017	03/26-27/2019: Janis sent shape files of project to Oscar. 03/27/2019: Oscar requested copies of reports he did not have in his library (Westwood and White 2005; Offermann 2013; Jimenez

Sites Reservoir Project  
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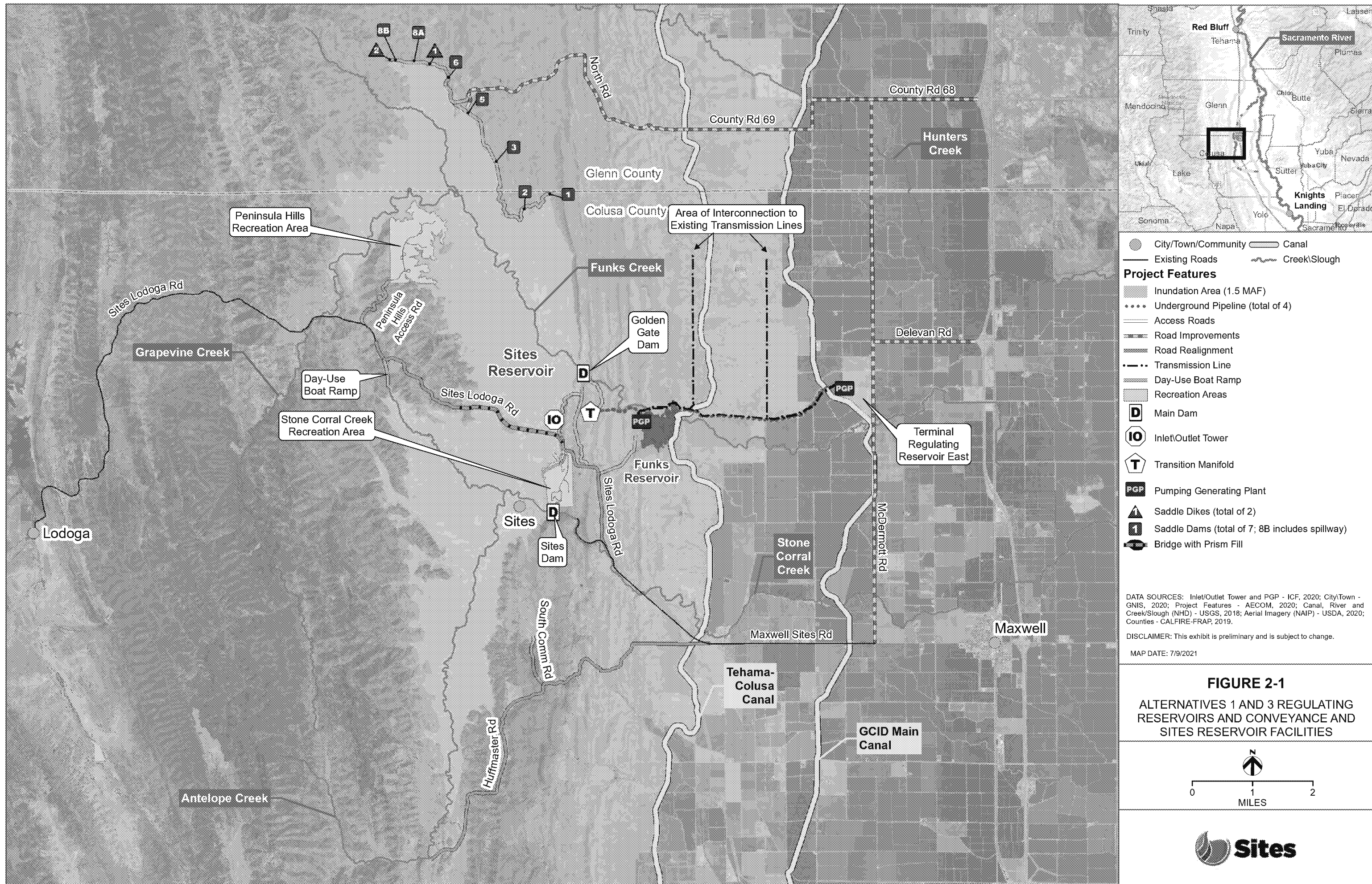
Action	Tribes	Tribal Response	Authority Response	Follow-up/Meetings	Notes
					2013; White 2003). Janis sent all but Westwood and White 2005, the same day of the request; will have to track down the last report. 08/09/2019: Janis received copy of Westwood and White 2005 and sent it to Oscar. 08/21/2019: Janis sent final Cultural Resources Sensitivity Report 08/23/2019: Janis sent updated APE shapefiles
	Charlie Wright, Chairperson Cortina Indian Rancheria of Wintun Indians	No formal response			
	Leland Kinter, Chairperson Yocha Dehe Wintun Nation	Phone call from Rei Rouse (GIS specialist) to Rob Thompson, requesting GIS data on February 27, 2019.  Letter requesting consultation was received by the Authority on March 25, 2019		Authority met with tribal representatives June 28, 2019 2017	07/01/2019: Janis sent GIS data and reports. Modified KMZs resent on 07/05/2019. 07/01/2019: Laverne Bill sent copies of treatment plans and monitoring contract template. 07/10/2019: Laurie sent thumb drive with public EIR/S, Project Feasibility Study, Geotech environmental commitments 08/21/2019: Janis sent final Cultural Resources Sensitivity Report 08/23/2019: Janis sent updated APE shapefiles
<b>2020 Revised EIR/S and continued consultations</b>					
AB 52 Project Notification letter November 13, 2020	Daniel Gomez, Chairperson Cachil Dehe Band of Wintun Indians	December 7, 2020: Colusa emailed response to Kevin that they would like to continue consultation on the project.	December 8, 2020: Emailed acknowledgement of request.	08/29/2019 10/22/2020	10/22/2020: Authority sent 2013 draft archaeological survey report and KMZs of survey and site data as follow-up to meeting. Resent on 10/26/2020. 11/18/2020: Letter received. 12/07/2020: Colusa emailed response that they would like to continue consultation on the project. 03/17/2021: An updated Project description was provided and GIS data was subsequently sent. 01/25/2022: Authority sent confidential cultural resources report prepared for RDEIR.
	Charlie Wright, Chairperson Cortina Indian Rancheria of Wintun Indians				11/16/2020: Letter received.
	Glenda Nelson, Chairperson Estom Yumeka Maidu Tribe of the Enterprise Rancheria				11/16/2020: Letter received. 12/17/2020: Follow up email sent to tribe.
	Ronald Kirk, Chairperson Grindstone Indian Rancheria of Wintun-Wailaki				01/06/2020: Original letter returned unclaimed. No contact information available for follow up.
	Dennis Ramirez, Chairperson Mechoopda Indian Tribe				12/17/2020: Follow up email sent to tribe. 02/06/2021: Return receipt arrived. Assume letter picked up first week of February 2021.

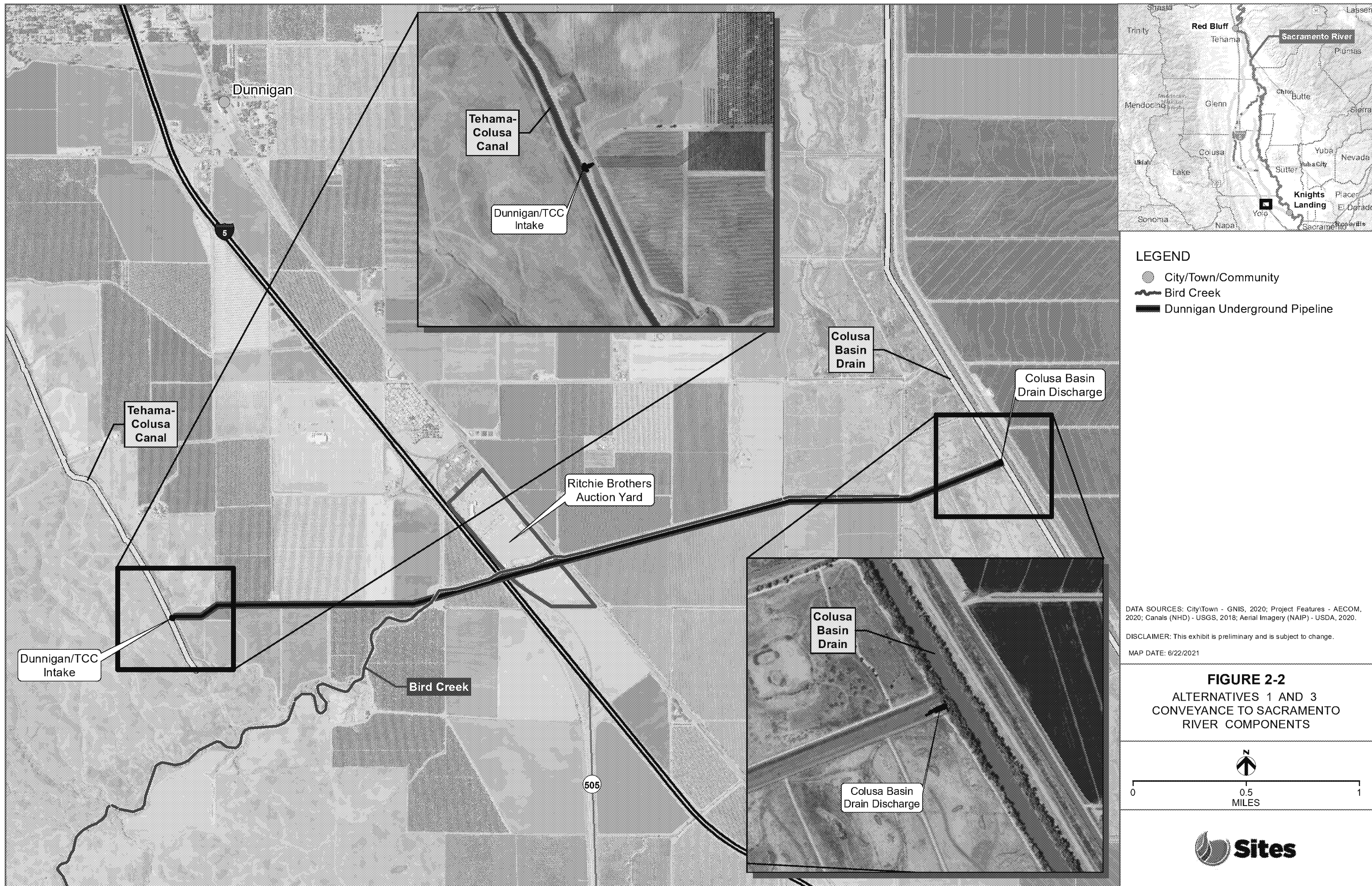
Sites Reservoir Project  
General AB 52 Tracking Sheet

Action	Tribes	Tribal Response	Authority Response	Follow-up/Meetings	Notes
	Andrew Alejandre, Chairperson Paskenta Band of Nomlaki Indians				11/18/2020: Letter received. 12/17/2020: Follow up email sent to tribe.
	Anthony Roberts, Chairperson Yocha Dehe Wintun Nation	November 23, 2020: Emailed letter from tribe to Kevin, requesting consultation and a field visit. Identified Laverne Bill as contact.	November 23, 2020: Kevin emailed acknowledgement of letter receipt.	06/28/2019 06/30/2020 10/06/2020 01/11/2021 05/21/2021 07/29/2021 08/25/2021 09/16/2021	07/01/2019: Project information, including draft cultural reports and GIS data sent to tribe following 06/28/2019 meeting. 07/05/2019: Additional GIS data sent to tribe. 11/16/2020: Letter received. 11/14/2020: Project background and updated materials provided to YD. 11/23/2020: YD emailed letter requesting consultation and a site visit to Kevin. Kevin immediately responded to acknowledge receipt. 01/11/2021: Field review with YD to look at project footprint. 03/15/2021: An updated Project description was provided to YD and GIS data was subsequently sent. 12/10/2021: Authority sent confidential cultural resources report prepared for RDEIR. 02/04/2022: YD submitted initial comments on RDEIR/S.
<b>2021 Additional Tribal Outreach</b>					
Expanded tribal outreach letter mailed June 15, 2021	Gary Rickard, Chairperson Wintu Tribe of Northern California	No formal response			07/08/2021: Phone call to request email address; left message on answering machine. Received a call back on 07/09/2021, and the letter was emailed on that date. No response.
	Jack Potter Jr., Chairperson Redding Rancheria	No formal response			07/08/2021. Failed attempt to email. Follow up phone call on same date to request email address; left message on answering machine. No response.
	Thaddeus Cason, Chairperson Konkow Valley Band of Maidu	No formal response			07/08/2021; No email or phone number provided on website. Failed attempt to email. No response.
	Sara Dutschke Setchwaelo, Chairperson Ione Band of Miwok Indians	No formal response			07/08/2021: Follow up email sent to tribe. No response.
	Regina Cuellar, Chairperson Shingle Springs Band of Miwok Indians	No formal response			07/08/2021: Follow up email sent to tribe. No response.
	Gene Whitehouse, Chairperson United Auburn Indian Community of the Auburn Rancheria	Email response on 07/22/2021 To 07/08/2021 follow-up email			07/08/2021: Follow up email sent to tribe. 07/22/2021: Received email response. Did not request consultation, deferring to local tribes. Requested copy of cultural resources report. 12/16/2022: UAIC submitted comments on the REIR/S.
<b>2022 Geophysical Studies</b>					
AB 52 Project Notification letter Dated February 7, 2022 (sent February 7, 2022)	Daniel Gomez, Chairperson Cachil Dehe Band of Wintun Indians				02/09/2022: letter package addressed to Chairman Gomez and Mr. Serrano were signed for (tracked via stamps.com) 02/15/2022: follow-up phone calls made, failed attempt. Follow- up email sent to Molly West at mwest@colusa-nsn.gov

Sites Reservoir Project  
General AB 52 Tracking Sheet

Action	Tribes	Tribal Response	Authority Response	Follow-up/Meetings	Notes
	Colusa Indian Community Council				
	Charlie Wright, Chairperson Cortina Indian Rancheria of Wintun Indians				02/10/2022: letter package was delivered and picked up (tracked via stamps.com) 02/15/2022: follow-up phone call made to the office, was told to call back at a later time for confirmation. 02/16/2022: followed up with another phone call and receipt of the letter package was verified
	Glenda Nelson, Chairperson Estom Yumeka Maidu Tribe of the Enterprise Rancheria				02/09/2022: letter package was delivered to the office (tracked via stamps.com) 02/15/2022: follow-up phone call, verified that the letter package was received
	Ronald Kirk, Chairperson Grindstone Indian Rancheria of Wintun-Wailaki				02/09/2022: letter package available for pickup, requires signature (tracked via stamps.com) 02/15/2022: follow-up phone call made, failed attempt. Follow-up email sent to Mr. Kirk at ronaldkirk1963@gmail.com
	Dennis Ramirez, Chairperson Mechoopda Indian Tribe				02/09/2022: letter packages addressed to Chairman Ramirez and THPO McHenry were delivered to the office (tracked via stamps.com) 02/15/2022: follow-up phone calls were made, voice mail left with Mr. McHenry to confirm receipt
	Andrew Alejandre, Chairperson Paskenta Band of Nomlaki Indians				02/10/2022: letter package was delivered (tracked via stamps.com) 02/15/2022: follow-up phone call made, verified receipt of letter package with reception, e-mailed a copy of the letter to the Administrator, Christina Sullivan, who said she would route the email/letter to Chairperson Alejandre.
	Anthony Roberts, Chairperson Yocha Dehe Wintun Nation				02/09/2022: letter packages addressed to Chairperson Roberts and THPO Kinter were delivered to the office (tracked via stamps.com) 02/15/2022: follow-up phone call was made, left a message with Deborah Jones asking for confirmation





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**From:** Alicia Forsythe [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=A6CDF06A7E904B65BAA21702A82AD329-AFORSYTHE]  
**Sent:** 7/8/2022 11:21:08 AM  
**To:** Jerry Brown [jbrown@sitesproject.org]  
**CC:** Heydinger, Erin [erin.heydinger@hdrinc.com]; Spranza, John [john.spranza@hdrinc.com]; JP Robinette [jrobinette@sitesproject.org]  
**Subject:** RE: Sites Input on DCP EIR

Hi all – Just had a great discussion with Carrie Buckman. She said that Sites is included as a cumulative project in DCP. In general with the operations of DCP, DWR expects to continue to prioritize the operations of the south Delta facilities first. Right now, the ability to move water within the transfer window at the south Delta is not limiting. Meaning there is generally more capacity to move transfer water than transfer water exists (which we generally found also). They have not specifically analyzed moving transfer water through the DCP as they really don't expect it to be used for transfer water. They generally expect the DCP to be used for SWP needs/water and transfer water to move as it does today.

So I think the quick message on this is – DCP would generally be operated for the benefit of the SWP and CVP and the contractors that have invested in the DCP. It is our understanding that generally, DWR and Reclamation envision to continue to move transfer water through the south Delta facilities as it moves today.

Hope this helps. Happy to chat.

Ali

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Alicia Forsythe | Environmental Planning and Permitting Manager | Sites Project Authority | 916.880.0676 |  
[aforsythe@sitesproject.org](mailto:aforsythe@sitesproject.org) | [www.SitesProject.org](http://www.SitesProject.org)

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**From:** Jerry Brown <jbrown@sitesproject.org>  
**Sent:** Thursday, July 7, 2022 11:23 AM  
**To:** Alicia Forsythe <aforsythe@sitesproject.org>  
**Cc:** Heydinger, Erin <erin.heydinger@hdrinc.com>; Spranza, John <john.spranza@hdrinc.com>; JP Robinette <jrobinette@sitesproject.org>  
**Subject:** Sites Input on DCP EIR

Were you able to touch base with Carrie and confirm how they are addressing Sites water in their EIR coming out soon, within the context of any of our Sites participants that are also DCP participants and may wish to convey their Sites water through the tunnel as opposed to through Delta as we have presumed in all of our modeling and EIR work to date?

I'm asking because I'm expecting this question could come up in the presentation I'm making tomorrow to WACO (orange county), and possibly in a couple of months where JP is presenting on Sites to the OC water summit where the tunnel project will also be speaking in the same session.

Please let us know.

---

**From:** Marcia Kivett [MKivett@sitesproject.org]  
**Sent:** 7/11/2022 8:42:49 AM  
**To:** Jerry Brown [jbrown@sitesproject.org]  
**Subject:** Fw: Request for comment  
**Attachments:** Prism Reports Response Final.docx

I will add this to SP. I am reaching out to Katz for the rest.

---

**From:** Ann Newton <anewton@katzandassociates.com>  
**Sent:** Tuesday, June 28, 2022 9:16 PM  
**To:** Kevin Spesert <kspesert@sitesproject.org>; Alicia Forsythe <aforsythe@sitesproject.org>; Jerry Brown <jbrown@sitesproject.org>; Sara M. Katz <skatz@katzandassociates.com>  
**Cc:** Marcia Kivett <MKivett@sitesproject.org>  
**Subject:** RE: Request for comment

Thanks all, attached is the final. I'll sign online around 7:30 to send to the reporter. If you have changes before then, I can make them but I think this looks good.



**Ann Newton**  
Director, Los Angeles  
d: 310.774.7639  
[San Diego](#) · [Los Angeles](#) · [San Francisco](#)

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**From:** Kevin Spesert <kspesert@sitesproject.org>  
**Sent:** Tuesday, June 28, 2022 5:19 PM  
**To:** Ann Newton <anewton@katzandassociates.com>; Alicia Forsythe <aforsythe@sitesproject.org>; Jerry Brown <jbrown@sitesproject.org>; Sara M. Katz <skatz@katzandassociates.com>  
**Cc:** Marcia Kivett <MKivett@sitesproject.org>  
**Subject:** Re: Request for comment

No other edits on my end

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**From:** Ann Newton <anewton@katzandassociates.com>  
**Sent:** Tuesday, June 28, 2022 5:09 PM  
**To:** Alicia Forsythe <aforsythe@sitesproject.org>; Jerry Brown <jbrown@sitesproject.org>; Kevin Spesert <kspesert@sitesproject.org>; Sara M. Katz <skatz@katzandassociates.com>  
**Cc:** Marcia Kivett <MKivett@sitesproject.org>  
**Subject:** RE: Request for comment

Thanks, Ali.

Other than adding FAQ links, which I can do this evening, are there any other changes or reviews that need to happen? If not, I will accept Ali's edits, add the FAQ links and email this off tonight,



**Ann Newton**  
Director, Los Angeles  
d: 310.774.7639  
[San Diego](#) · [Los Angeles](#) · [San Francisco](#)

---

**From:** Alicia Forsythe <[aforsythe@sitesproject.org](mailto:aforsythe@sitesproject.org)>

**Sent:** Tuesday, June 28, 2022 2:59 PM

**To:** Jerry Brown <[jbrown@sitesproject.org](mailto:jbrown@sitesproject.org)>; Ann Newton <[anewton@katzandassociates.com](mailto:anewton@katzandassociates.com)>; Kevin Spesert <[kspesert@sitesproject.org](mailto:kspesert@sitesproject.org)>; Sara M. Katz <[skatz@katzandassociates.com](mailto:skatz@katzandassociates.com)>

**Cc:** Marcia Kivett <[MKivett@sitesproject.org](mailto:MKivett@sitesproject.org)>

**Subject:** RE: Request for comment

I had just a few changes in the attached. These look good.

-----  
Alicia Forsythe | Environmental Planning and Permitting Manager | Sites Project Authority | 916.880.0676 |  
[aforsythe@sitesproject.org](mailto:aforsythe@sitesproject.org) | [www.SitesProject.org](http://www.SitesProject.org)

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**From:** Jerry Brown <[jbrown@sitesproject.org](mailto:jbrown@sitesproject.org)>

**Sent:** Tuesday, June 28, 2022 2:45 PM

**To:** Ann Newton <[anewton@katzandassociates.com](mailto:anewton@katzandassociates.com)>; Kevin Spesert <[kspesert@sitesproject.org](mailto:kspesert@sitesproject.org)>; Sara M. Katz <[skatz@katzandassociates.com](mailto:skatz@katzandassociates.com)>; Alicia Forsythe <[aforsythe@sitesproject.org](mailto:aforsythe@sitesproject.org)>

**Cc:** Marcia Kivett <[MKivett@sitesproject.org](mailto:MKivett@sitesproject.org)>

**Subject:** Re: Request for comment

#7 needs wordsmithing

Add a couple links to our FAQs

After they issue their article we can post this as additional FAQ material.

thanks

---

**From:** Ann Newton <[anewton@katzandassociates.com](mailto:anewton@katzandassociates.com)>

**Date:** Tuesday, June 28, 2022 at 2:42 PM

**To:** Kevin Spesert <[kspesert@sitesproject.org](mailto:kspesert@sitesproject.org)>, "Sara M. Katz" <[skatz@katzandassociates.com](mailto:skatz@katzandassociates.com)>, Jerry Brown <[jbrown@sitesproject.org](mailto:jbrown@sitesproject.org)>, Alicia Forsythe <[aforsythe@sitesproject.org](mailto:aforsythe@sitesproject.org)>

**Cc:** Marcia Kivett <[MKivett@sitesproject.org](mailto:MKivett@sitesproject.org)>

**Subject:** RE: Request for comment

Ok thanks, once it's ready, I can review and then send onto the reporter.



**Ann Newton**

Director, Los Angeles

d: 310.774.7639

San Diego · Los Angeles · San Francisco

---

**From:** Kevin Spesert <[kspesert@sitesproject.org](mailto:kspesert@sitesproject.org)>

**Sent:** Tuesday, June 28, 2022 2:41 PM

**To:** Sara M. Katz <[skatz@katzandassociates.com](mailto:skatz@katzandassociates.com)>; Jerry Brown <[jbrown@sitesproject.org](mailto:jbrown@sitesproject.org)>; Alicia Forsythe <[aforsythe@sitesproject.org](mailto:aforsythe@sitesproject.org)>; Ann Newton <[anewton@katzandassociates.com](mailto:anewton@katzandassociates.com)>

**Cc:** Marcia Kivett <[MKivett@sitesproject.org](mailto:MKivett@sitesproject.org)>

**Subject:** RE: Request for comment

All,

I have made a few changes to Jerry's first cut...I just talked with Ali and she is going to make some edits as well...

---

**From:** Sara M. Katz <[skatz@katzandassociates.com](mailto:skatz@katzandassociates.com)>

**Sent:** Tuesday, June 28, 2022 1:46 PM

**To:** Kevin Spesert <[kspesert@sitesproject.org](mailto:kspesert@sitesproject.org)>; Jerry Brown <[jbrown@sitesproject.org](mailto:jbrown@sitesproject.org)>; Alicia Forsythe <[aforsythe@sitesproject.org](mailto:aforsythe@sitesproject.org)>; Ann Newton <[anewton@katzandassociates.com](mailto:anewton@katzandassociates.com)>

**Cc:** Marcia Kivett <[MKivett@sitesproject.org](mailto:MKivett@sitesproject.org)>

**Subject:** RE: Request for comment

Passing emails in the night, so to speak 😊

---

**From:** Kevin Spesert <[kspesert@sitesproject.org](mailto:kspesert@sitesproject.org)>

**Sent:** Tuesday, June 28, 2022 1:42 PM

**To:** Sara M. Katz <[skatz@katzandassociates.com](mailto:skatz@katzandassociates.com)>; Jerry Brown <[jbrown@sitesproject.org](mailto:jbrown@sitesproject.org)>; Alicia Forsythe <[aforsythe@sitesproject.org](mailto:aforsythe@sitesproject.org)>; Ann Newton <[anewton@katzandassociates.com](mailto:anewton@katzandassociates.com)>

**Cc:** Marcia Kivett <[MKivett@sitesproject.org](mailto:MKivett@sitesproject.org)>

**Subject:** RE: Request for comment

Just sent it to you

---

**From:** Sara M. Katz <[skatz@katzandassociates.com](mailto:skatz@katzandassociates.com)>

**Sent:** Tuesday, June 28, 2022 1:41 PM

**To:** Kevin Spesert <[kspesert@sitesproject.org](mailto:kspesert@sitesproject.org)>; Jerry Brown <[jbrown@sitesproject.org](mailto:jbrown@sitesproject.org)>; Alicia Forsythe <[aforsythe@sitesproject.org](mailto:aforsythe@sitesproject.org)>; Ann Newton <[anewton@katzandassociates.com](mailto:anewton@katzandassociates.com)>

**Cc:** Marcia Kivett <[MKivett@sitesproject.org](mailto:MKivett@sitesproject.org)>

**Subject:** RE: Request for comment

Is the draft available? It was not attached. Not much lead-time offered by said reporter. Thanks



**Sara M. Katz**

Founder/CEO

mobile: [619.813.9551](tel:619.813.9551)

[San Diego](#) · [Los Angeles](#) · [San Francisco](#)

---

**From:** Kevin Spesert <[kspesert@sitesproject.org](mailto:kspesert@sitesproject.org)>

**Sent:** Tuesday, June 28, 2022 1:34 PM

**To:** Jerry Brown <[jbrown@sitesproject.org](mailto:jbrown@sitesproject.org)>; Alicia Forsythe <[aforsythe@sitesproject.org](mailto:aforsythe@sitesproject.org)>; Sara M. Katz <[skatz@katzandassociates.com](mailto:skatz@katzandassociates.com)>; Ann Newton <[anewton@katzandassociates.com](mailto:anewton@katzandassociates.com)>

**Cc:** Marcia Kivett <[MKivett@sitesproject.org](mailto:MKivett@sitesproject.org)>

**Subject:** RE: Request for comment

I think we should as well...I am included Sara and Ann in the thread as this is a media request

---

**From:** Jerry Brown <[jbrown@sitesproject.org](mailto:jbrown@sitesproject.org)>  
**Sent:** Tuesday, June 28, 2022 1:03 PM  
**To:** Alicia Forsythe <[aforsythe@sitesproject.org](mailto:aforsythe@sitesproject.org)>; Kevin Spesert <[kspesert@sitesproject.org](mailto:kspesert@sitesproject.org)>  
**Cc:** Marcia Kivett <[MKivett@sitesproject.org](mailto:MKivett@sitesproject.org)>  
**Subject:** Re: Request for comment

I think we should respond to this. Here's a quick initial draft for your review/input.

---

**From:** Sandra Yarbrough <[syarbrough@sitesproject.org](mailto:syarbrough@sitesproject.org)>  
**Date:** Tuesday, June 28, 2022 at 11:48 AM  
**To:** Jerry Brown <[jbrown@sitesproject.org](mailto:jbrown@sitesproject.org)>, Alicia Forsythe <[aforsythe@sitesproject.org](mailto:aforsythe@sitesproject.org)>, Kevin Spesert <[kspesert@sitesproject.org](mailto:kspesert@sitesproject.org)>  
**Cc:** EIR-EIS-Comments <[eir-eis-comments@sitesproject.org](mailto:eir-eis-comments@sitesproject.org)>, Marcia Kivett <[MKivett@sitesproject.org](mailto:MKivett@sitesproject.org)>  
**Subject:** Request for comment

This call came through the Maxwell office and I asked her to email me so I could forward it along.

Thanks,  
Sandra

---

**From:** Ray Levy Uyeda <[ray@prismreports.org](mailto:ray@prismreports.org)>  
**Sent:** Tuesday, June 28, 2022 11:38 AM  
**To:** Sandra Yarbrough <[syarbrough@sitesproject.org](mailto:syarbrough@sitesproject.org)>  
**Subject:** Fwd: Comment Request for Prism Reports

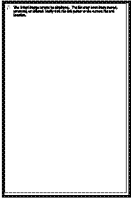
----- Forwarded message -----

**From:** **Ray Levy Uyeda** <[ray@prismreports.org](mailto:ray@prismreports.org)>  
**Date:** Tue, Jun 21, 2022 at 11:17 AM  
**Subject:** Comment Request for Prism Reports  
**To:** <[info@sitesproject.org](mailto:info@sitesproject.org)>

To Whom It May Concern:

My name is Ray Uyeda and I'm a climate justice reporter at Prism Reports. I'm writing about the Sites Reservoir, and I wanted to offer an opportunity to comment on the following items. Please let me know if you intend to provide a comment by Wednesday, 6/29 at 8 am PST.

1. The project claims that the Sites Reservoir will be beneficial to native birds and fish. What specific benefits will the reservoir offer?
2. How many feet across will the reservoir be?
3. The reservoir claims to "capture excess water from storms." What is "excess water"? Will water be captured in non-storm seasons, like summer?
4. Does the Sites Reservoir have a plan to mitigate methane releases? If so, what is the plan?
5. Does the Sites Reservoir have a plan to mitigate evaporation? If so, what is the plan?
6. What is the project's response to the numerous harms Native Tribes and leaders have alerted to, specifically those regarding salmon runs and overall population health?
7. Would the Sites Reservoir pull as much as 100,000 acre feet of water from tributaries even in drought years?
8. What is the current predicted cost of operationalizing the Sites Reservoir?



Ray Levy Uyeda (they/them)  
Staff Reporter, Prism  
650.815.6032 | [ray@prismreports.org](mailto:ray@prismreports.org)  
[prismreports.org](http://prismreports.org)



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**1. The project claims that the Sites Reservoir will be beneficial to native birds and fish. What specific benefits will the reservoir offer?**

As part of the Prop 1 State investment in the Sites Reservoir, approximately 240,000 acre-feet of storage space will be controlled and entitled to serve strictly as an asset for the environment. This portion of the reservoir will be specifically operated under the direction of CDFW. Among the possible uses of this asset is deliveries to the managed refuge habitats within the Pacific flyway leading to increased water for birds and fish, primarily during the driest years.

Please refer to the Sites FAQ for additional background questions and answers related to environmental benefits.

**2. How many feet across will the reservoir be?**

The reservoir is planned to be approximately 14,000 acres of inundated area. The expected measurements of the reservoir surface will be determined based as on survey and engineering details developed as the project progresses.

**3. The reservoir claims to "capture excess water from storms." What is "excess water"? Will water be captured in non-storm seasons, like summer?**

Diversions to Sites will only occur under strict and protective conditions established by permits issued by state regulatory agencies. Excess is a term used to define water flow conditions in the Delta when all beneficial uses are being met with un-stored water. Aside from excess conditions, the Sites water right will include conditions to protect all other water rights and environmental needs prior to initiating diversions into Sites Reservoir. Sites would not be authorized to divert water in the summer season.

**4. Does the Sites Reservoir have a plan to mitigate methane releases? If so, what is the plan?**

Methane release as a result of the Sites reservoir operations is not anticipated to be a significant environmental effect.

**5. Does the Sites Reservoir have a plan to mitigate evaporation? If so, what is the plan?**

Evaporation is anticipated as part of the reservoir operation and has been accounted in the analysis of the project operations. It is not feasible to cover the reservoir of this type.

**6. What is the project's response to the numerous harms Native Tribes and leaders have alerted to, specifically those regarding salmon runs and overall population health?**

The Sites Project Authority has been engaged in ongoing coordination with Tribes who are culturally associated with the region where the proposed project would be sited. The Authority has been actively engaging in AB 52 coordination with these Tribes and will continue to do so as we further development of the project.

The Authority would be happy to engage in constructive dialogue on any specific questions or issues Tribes or any others interested in the Project may have. The Sites Authority is committed to a collaborative, open, and transparent process for project development.

**7. Would the Sites Reservoir pull as much as 100,000 acre feet of water from tributaries even in drought years?**

The project operations have been modeled to simulate operations and these simulations do show there can be very wet periods during dry years. The storms in October and December 2021 are a perfect example. As a result of record rainfall and significant snow events that occurred in October and December, the Project's diversion criteria would have been met and some diversions would have been allowed for the Project. While diversions are expected to be minimal in drought years, there are times, like October through December of 2021, where we can have very wet conditions – even in drought years.

**8. What is the current predicted cost of operationalizing the Sites Reservoir?**

The most current total project cost estimate is \$3.93B in 2021 dollars.

Meeting: **Sites Reservoir Committee, Environmental Planning and Permitting Workgroup**

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Locations: Maxwell Project Office, 122 Old Highway 99W, Maxwell, CA 95955  
See below for alternate meeting locations.

---

Call in: **1-916-538-7066** Code: **209 737 511#** [Click here to join the meeting](#)

Workgroup Chair: Heather Dyer (SBVMWD)

Staff Lead: Ali Forsythe, Environmental Planning and Permitting Manager

## **AGENDA**

**Thursday, July 14, 2022; 1:00 pm – 2:30 pm**

**NO ACTION or DECISION WILL BE TAKEN**

### **ROLL CALL & CALL TO ORDER:**

- Introductions.
- Period for Public Comment.

### **1. Discussion and Information Items:**

- 1.1 Status of the Project's Biological Assessment to be submitted to the U.S. Fish and Wildlife Service and National Marine Fisheries Service
- 1.2 Status of the Authority's Operations Incidental Take Permit application to the California Department of Fish and Wildlife
- 1.3 Status of the Authority's 2022-2024 Geologic, Geophysical, and Geotechnical Investigations Final Environmental Assessment/Initial Study, Mitigated Negative Declaration and Mitigation Monitoring and Reporting Plan

### **2. Environmental Planning and Permitting Manager's Report:**

- Key Planning and Permitting Activities Report

### **3. Upcoming Meetings:**

#### **Reservoir Committee**

Friday, July 22, 2022 – 9:00 AM to 12:00 PM

#### **Authority Board**

Wednesday, July 27, 2022 – 1:30 to 4:00 PM

**Environmental Planning and Permitting Workgroup**  
Wednesday, August 10, 2022 (1:00 – 2:30 pm)

Virtual Information will be provided before all meetings at [Sitesproject.org](https://sitesproject.org).

## **ADJOURN**

PERIOD OF PUBLIC COMMENT: Any person may speak about any subject of concern, provided it is within the jurisdiction of the Reservoir Committee Environmental Planning and Permitting Workgroup and is not already on today's agenda. The total amount of time allotted for receiving such public communication shall be limited to a total of 10 minutes per issue and each individual or group will be limited to no more than 3 minutes each within the 10 minutes allocated per issue. **Note:** No action shall be taken on comments made under this comment period.

ADA COMPLIANCE: Upon request, agendas will be made available in alternative formats to accommodate persons with disabilities. In addition, any person with a disability who requires a modification or accommodation to participate or attend this meeting may request necessary accommodation. Please make your request to the Board Clerk, specifying your disability, the format in which you would like to receive this Agenda and any other accommodation required no later than 24 hours before the start of the meeting.

### **Alternate Meeting Locations:**

Glenn-Colusa Irrigation District, 344 East Laurel St, Willows, CA 95988

San Bernardino Valley Municipal WD, 380 E. Vanderbilt Way, San Bernardino, CA 92408

Coachella Valley Water District, 51501 Tyler Street, Coachella CA 92236

Reclamation District 108, 975 Wilson Bend Rd., Grimes, CA 95950

Wheeler Ridge-Maricopa Water Storage District, 12109 Hwy 166, Bakersfield, CA 93313

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**From:** Marcia Kivett [MKivett@sitesproject.org]  
**Sent:** 7/11/2022 12:29:58 PM  
**To:** Jerry Brown [jbrown@sitesproject.org]  
**Subject:** Fw: FAQs in Word Doc  
**Attachments:** FAQ Environmental 1.12.22.docx; FAQ.docx; FAQ - General .docx; FAQ - Operations.docx

I spoke with Sarah R. and she said she will have them in SP today. In the meantime, see the attached. Let me know if there are additional ones you would like me to convert.

---

**From:** Marcia Kivett <MKivett@sitesproject.org>  
**Sent:** Monday, July 11, 2022 12:11 PM  
**To:** Jerry Brown <jbrown@sitesproject.org>  
**Subject:** Re: FAQs in Word Doc

Does this work for you?

**From:** Jerry Brown <jbrown@sitesproject.org>  
**Sent:** Monday, July 11, 2022 11:53 AM  
**To:** Marcia Kivett <MKivett@sitesproject.org>  
**Subject:** Re: FAQs in Word Doc

Any luck getting these on sharepoint? I am preparing a one pager for MWD and my deadline to get this out is today and my window to work this is shrinking. thanks

---

**From:** Marcia Kivett <MKivett@sitesproject.org>  
**Date:** Monday, July 11, 2022 at 8:27 AM  
**To:** Jerry Brown <jbrown@sitesproject.org>  
**Subject:** Re: FAQs in Word Doc

Let me know if you are not able to access this link - [OUTREACH MATERIALS](#)

---

**From:** Jerry Brown <jbrown@sitesproject.org>  
**Sent:** Monday, July 11, 2022 8:23 AM  
**To:** Marcia Kivett <MKivett@sitesproject.org>  
**Subject:** FAQs in Word Doc

Where can I find the FAQs that are posted to the website in a word doc format?

**What are the environmental implications of this project?**

The environmental effects of the Project have been analyzed in detail in the Revised Draft EIR/ Supplemental Draft EIS. Transformational projects of the magnitude and importance of Sites are not without tradeoffs. There are specific elements of the Project that are critical to enhancing environmental conditions. First, the State has made a large investment, through the 2014 passage of Proposition 1, to enhance their ability to support critical aquatic needs. Second, there are opportunities to partner with the State and Federal water projects in coordinated operations that will enhance fishery protections associated with their operations. Beyond these enhancements, the Project itself is being designed to avoid and lessen any environmental concerns and, when necessary, provide appropriate mitigation. The Revised Draft EIR/Supplemental Draft EIS Executive Summary (available here [sitesproject.org/environmental-review](http://sitesproject.org/environmental-review)) summarizes the environmental effects that have been identified, including those that are significant and unavoidable.

**How much water will Sites take from the Trinity River? Or how will Sites impact the Trinity River?**

No water will be diverted from the Trinity River to fill Sites Reservoir. The unique location of the reservoir means the Project is not competing for other water resources. Instead the Sites Reservoir will be complementary to these facilities and enhance the ability to optimize the limited water resources.

All water diverted into Sites Reservoir will come from the Sacramento River, primarily from the streams

and creeks that flow into the river downstream of the Shasta and Keswick Dams, with the exception of extreme events where Shasta Dam is releasing water to avoid flooding in which case some of this released water may be diverted into Sites.

**Will the project harm fish species in the Sacramento-San Joaquin Delta?**

No. Sites Reservoir does not threaten salmon and other fish. In fact, there are highly protective operating conditions in place that must be in place before diversions into Sites Reservoir can proceed, including adapting to evolving conditions. In addition, the intakes being used for diverting water into Sites Reservoir include state-of-the-art fish screens that are proven to be highly effective at protecting fish. And, the current proposed project includes more cold water for salmon in the driest years when it is needed most. Not only is no harm done, but there is also a net benefit from this project to Sacramento River salmon, Delta smelt, and the Sacramento-San Joaquin Delta estuary.

**Has the Sites Project Authority analyzed and considered a comprehensive range of environmental mitigation and protections to support salmon and the Bay-Delta ecosystem?**

Absolutely, and there are a couple of specific elements of the Project that are critical to supporting environmental needs. First, the State has made a large investment in the Project through Proposition 1 to enhance their ability to support these critical systems. Second, there are opportunities to partner with the State and Federal water projects in coordinated operations that will enhance fishery protections associated with their operations. Beyond these enhancements, the Project itself is being designed to avoid and lessen any environmental concerns and, when necessary, provide appropriate mitigation.

### **How does Sites address temperature management efforts for salmon protection?**

All species have varying needs throughout their lives. Suitable water temperatures for cold-water fish are important but not the only important component. They need food to sustain and grow along with places to take cover and rest while migrating to the ocean among other things. While temperature management alone does not meet all of the needs of cold-water fish, it is an important component.

Sites has been shown to have the ability to assist in the Bureau of Reclamation's temperature management efforts for salmon protection in the Sacramento and American River systems through water exchanges. The Bureau of Reclamation would establish the criteria for these exchanges through its temperature management planning which weighs risks and rewards of various potential protective actions. Sites is a potential tool for use in managing temperature but is not limited to serving this purpose only. Sites provides additional benefits to the environment, including assisting in providing stability for flows in the fall to reduce salmon redd dewatering, providing additional food resources for Delta smelt in the north Delta, among other existing and potential benefits. It would be shortsighted to conclude that the federal government should not invest in Sites based on conclusions about current temperature management efforts being less than optimal. The fact is that Sites creates new water supply for drier periods and flexibility to deal with uncertainty of climate change. Both of these attributes are beneficial to the environment and worthy of federal investment.

### **Is Sites being built on native lands? How will it impact tribal people?**

Both the Sites Project Authority and the Bureau of Reclamation have consulted and will continue to consult with recognized Native American Tribes regarding impacts to Tribal people and resources. This is described in detail in Chapter 23 and Chapter 29 of the Revised Draft EIR/Supplemental Draft EIS. The Authority has reached out to over a dozen Tribes under Assembly Bill 52 and is in ongoing consultation under AB 52 with several tribes. There are Native American human remains and other tribal resources in the footprint of the reservoir and the Authority is working closely with the Tribes that historically inhabited the reservoir footprint to address impacts to these resources and ensure Native American human remains are addressed consistent with the Tribes' requests. As described in Chapter 29 of the Revised Draft EIR/Supplemental Draft EIS, the Project does not occur in an area that would affect Indian hunting or water rights nor is the alternative on Indian trust lands.

### **Have Native American tribes been consulted?**

Yes. Both the Sites Project Authority and the Bureau of Reclamation have consulted and will continue to consult with recognized Native American tribes regarding impacts to Tribal people and resources. The Authority has reached out to over a dozen tribes under Assembly Bill 52 and is in ongoing consultation under AB 52 with several tribes.

### **How were the RDEIR/SDEIS virtual public meetings announced?**

A variety of notification methods and channels were used to announce the virtual public meetings,

availability of the RDEIR/SDEIS, and public comment period, including:

- Authority's Notice of Availability emailed to agencies, Tribes, NGOs, and interested

parties

- Reclamation's Notice of Availability published in the Federal Register
- Press release disseminated to media outlets
- Notices posted to the Authority and Reclamation's websites
- Numerous Authority and Reclamation social media posts
- Advertisement published in eight local area newspapers
- Direct mailing to landowners and interested parties
- A series of email blasts to interested public members

To receive future project updates, sign up to be added to the Authority's email list here:  
[Contact - Sites Reservoir \(sitesproject.org\)](https://sitesproject.org).

**Will Sites Reservoir help increase water supplies in future droughts?**

Yes. Sites Reservoir is an insurance policy for future droughts. Sites Reservoir does not rely on snowpack and if the scientific projections are correct about the impacts of climate change (i.e. California is expected to receive about the same annual precipitation that it currently does but more will come as rain instead of snow), then having Sites Reservoir will mean we can safely collect more water in the reservoir for use during future droughts.

**Will Sites Reservoir divert water from the Sacramento River even during critically dry years?**

It depends. Even during drier years there can be significant precipitation events that present conditions where water can be diverted safely from the river and placed in Sites Reservoir. All diversions will be subject to the highly protective operating conditions that are currently being proposed and will ultimately be permitted by State and Federal regulatory agencies for the Sites Reservoir Project.

**Will Sites Reservoir decrease Delta flows?**

Yes, slightly, when the Project is diverting. However, since the Sites Reservoir diversions occur only when there are high river flows, any reduction to Delta flows would be minor and would not impact any of the beneficial uses of the water in the Delta. Storing water in Sites Reservoir during times when there is a lot of flow in the Sacramento River for use during times with the flows are low, including during drought periods, is part of the statewide strategy for adapting to changing climate conditions and to return much needed flexibility to the statewide water management system.

**Have concerns about the impact of Sites Reservoir operations on the environment been addressed in the current proposal?**

The Project operations have been modified substantially over the last two years to be more protective of the environment. These modifications have reduced the Project diversions from the Sacramento River substantially, in fact diversions have been reduced almost in half, as compared to the criteria proposed in 2017. The current Project operations strikes the needed balance between environmental protections and Project affordability that must exist for the Project to proceed.

**How much would have been diverted in 2021?**

Zero diversions into the reservoir in 2021 would have occurred if Sites Reservoir would have been in place. This is in accordance with the highly protective operating conditions that are currently being proposed for the Project.

However, the one million acre-feet estimate that would have already been stored as result of the wetter years in 2017 and 2019 is the water that would be available today. And if 2022 is another dry year it is estimated there could be approximately 400,000 acre-feet of that left in Sites. This water is badly needed addition to a severely depleted water supply system that was not built to address future climate.

**Is Sites Reservoir compliant with Proposition 1?**

Even with the Project changes that have occurred since the original award in 2018, the Sites Reservoir Project continues to provide the public benefits the California Water Commission conditionally approved for the Project in State Proposition 1 funding in 2018. The Project meets the Proposition 1 conditions and continues to meet all the feasibility requirements for investment by the State. In December 2021, the California Water Commission deemed the Project feasible.

**Who profits from Sites Reservoir?**

The Sites Reservoir Project is led by a Joint Powers Authority made up of irrigation agencies, water districts, cities, and counties in the Sacramento Valley area. The Project is being developed on a beneficiary pays principle which means that the benefits received are paid

for by those receiving the benefits. The beneficiaries of the Project include the federal government, state government, and local public agencies. The water generated by the Project will be used for agriculture, meeting water demands of businesses and residents, and serving the needs of the environment throughout California.

#### **Is Sites Reservoir a private reservoir?**

No. Sites Reservoir is funded 100 percent by local, state, and federal public dollars. There are environmental, recreational and flood control benefits — as well new dry year water supplies secured for public agency ratepayers throughout California. Participation in Sites is broad and diverse, including the Bureau of Reclamation, State of California, urban areas of Southern California and the Bay Area, as well as public irrigation districts in the Sacramento Valley and San Joaquin Valley.

#### **How does the cost of water from Sites compare to other sources during dry years?**

The Sites Reservoir compares favorably to other dry year water supply alternatives which improves water affordability for Project participants and the 24 million users they serve, including disadvantaged communities. With water being one of California's most scarce and valuable resources, it is essential to develop a diverse portfolio of sustainable water supply solutions. But it is equally important for decision-makers and stakeholders to evaluate the most cost-effective options available to maximize the value of these investments. The Project has been designed to put the state's limited water resources to the best use in an affordable, flexible, and sustainable way.

#### **How can member agencies be assured that there will be water in Sites Reservoir if they are paying for storage?**

Sites Reservoir is a beneficiary pays project, which means that the benefits of the project go to those paying. Each participant (including environmental uses) has control over their portion of the storage space and a proportionate share of the water diverted into Sites Reservoir. There is flexibility in the timing and uses of the water, including for the environment. The assurance of water being in the reservoir is largely the result of the individual participant decisions in their operations of their portion of the facility. This way, each member is assured to receive what they pay for in a way that works within and complements that member's water supply portfolio.

#### **Why has it taken so much time to get Sites to the finish line?**

Sites has been around for decades with efforts originally being led by the California Department of Water Resources and the Bureau of Reclamation. The Project had starts and stops, as is typically seen in large projects led by the state or federal government. The Sites Project Authority was formed in 2010 to move the Project more expeditiously. Big projects take time and careful consideration, and the Authority has done that over the last decade and will continue into the future. Sites Reservoir is anticipated to be operational around 2030. The Authority has made great strides over the last two years to "right-size" the Project for affordability and permitability, two critical success factors. This represents a huge milestone for Project advancement and sets a turning point that makes the Project more feasible and more likely to be built than ever before.

#### **Why does this project make sense now, after 60 years?**

Many aspects of water management in California have changed in the recent decade that put the Sites Reservoir on the fast track to completion. These changes include the implementation of the Sustainable Groundwater Management Act, the continued declining reliability of the state and federal water projects, increasing regulatory changes requiring diversification of water purveyors' water portfolios, and the need for water resiliency to address the inevitable uncertainty of the changing climate. Additionally, never before has California had a means to invest in storing water for the environment which was made possible with the overwhelming

voter passage in 2014 of Proposition 1 making \$2.7 billion available for public benefits of water storage. Approximately 18% of Sites Reservoir is dedicated to delivering water for the environmental purposes as a result of Proposition 1 funds which, for the first time, creates an asset California's regulators can use to adaptively manage for the benefit of fish and wildlife.

**In hindsight, should this project have been built when originally contemplated, and if so what would be different today?**

Hindsight is always 20/20 and if Sites had been built decades ago the added flexibility it would have created

would have been very beneficial for California water management over the years. From a more recent perspective, if California had Sites Reservoir in a dry year like 2021 it is estimated there would be close to 1 million acre-feet

of additional water supplies available for farms, cities and the environment. Sites Reservoir diverts water in wet periods and stores that water for use in the drier times.

**Is Sites being built to send more water South?**

Sites is being built to provide resiliency, reliability and flexibility to the statewide water supplies for all

of California to adapt to the impacts of climate change to the state's water management infrastructure. The new water created by the Project and the added flexibility that comes from being able to store water will improve and enhance water management throughout California.

**Is this reservoir a stand-alone, or does it work with other regional reservoirs?**

Sites Reservoir is uniquely located in relation to other major components of the state and federal water projects like Shasta Lake, Lake Oroville and Folsom Lake. Sites is complementary to these existing crucial elements of statewide water management and could act to extend the functions they serve by creating flexibility to adapt to changing river and Delta management conditions. For example, Sites can be operated in coordination with Shasta Lake to preserve and enhance cold water for endangered salmon in the Sacramento River. Or Sites could contribute to the increased fresh-water flow into the Delta during drier periods to assist with salinity management of this critical estuary. Sites would not compete for the water resources stored in these state and federal facilities but would increase the total amount of managed water in storage. With the uncertainty California water managers face in the next century, having the Sites Reservoir is a necessity for statewide water management.

**Does Sites Reservoir need new Delta conveyance?**

No. The project is not dependent on the construction of Delta tunnels. Sites Reservoir will function independently, with or without a new Delta conveyance system. The Draft Environmental Impact Report/Statement evaluates Sites Reservoir as a standalone project.

**Since Sites only receives water when there is "surplus" flow in the Sacramento River, how long is it projected now before the reservoir is full under "normal" precipitation patterns?**

In California water there is no "normal" water year. Based on 82 years of past hydrology analyzed using standard models and methods, it would take, on average, approximately five to seven years for the reservoir to fill completely on first fill. In contrast, in a single water year like 2016-2017 it would have been possible to fill the reservoir in one year. Similarly, if a string of dry years was to occur, it would take longer

to fill, maybe as much 10 years. Surprisingly, there tends to be “surplus” flow in the river in all years. Even in dry and critically dry years, there would be filling opportunities, albeit fairly limited.

The original construction of Los Vaqueros Reservoir in Contra Costa County provides a real-life example of the possible variability in fill rates. The first fill of the 100,000 acre-foot reservoir was expected to take five to seven years. However, the first year of operation was 1997-1998, a fairly wet year of high-quality water being available at the intakes, which allowed the reservoir first fill to be completed in just two years.

**How much above the statistical normal for rainfall in the region does rainfall have to be for Sites to receive “surplus” water from the Sacramento River?**

Sites is designed to divert water through existing state-of-the-art fish screens only when actual flows on the Sacramento River exceed that needed by more senior water right holders, the Delta is in “excess” conditions, and based on stringent criteria to protect aquatic resources. Sites primarily diverts flows into the Sacramento River from streams and creeks downstream of Shasta/Keswick Dams. The exception is that Sites could pick up water that gets released from these dams under flood control conditions. The operations modeling typically conducted for water projects does not rely on rainfall statistics. Instead, model simulations (CalSim) calibrated to actual flow conditions for an 82-year period covering 1921-2003 are overlaid with current permit and operating constraints to evaluate with project conditions.

**How much above the statistical normal for rainfall in the region does rainfall have to be for Sites to receive “surplus” water from the Sacramento River?  
(continued)**

The beneficial thing about this approach is that you can simulate future with climate change conditions which has been done for the Sites Project. The results of these with climate change simulations demonstrate that the performance of the project actually improves 5 to 10 percent with climate change. This is good for all of the project partners including the state and federal governments which are approximately 25 percent shareholders for environmental purposes.

**How will this project utilize and capitalize on existing infrastructure and what does that mean for the project footprint?**

Extending the performance of existing infrastructure is good public policy, good business practice and makes for a more sustainable footprint by reducing the environmental impact of the constructed work. The Project will utilize existing facilities and infrastructure to a great extent and the existing topography of the reservoir site itself is a natural bowl perfectly situated to accommodate a water reservoir. A significant portion of the 100+ miles of conveyance (canals and pipelines) involved in the Project will be existing facilities. The only new conveyance envisioned is the inlet/outlet works for the reservoir and the four miles of 10-foot diameter pipeline to convey water back to the Sacramento River between the Tehama-Colusa Canal and the Colusa Basin Drain.

**What are the environmental implications of this project?**

The environmental effects of the Project have been analyzed in detail in the Revised Draft EIR/ Supplemental Draft EIS. Transformational projects of the magnitude and importance of Sites are not without tradeoffs. There are specific

elements of the Project that are critical to enhancing environmental conditions. First, the State has made a large investment, through the 2014 passage of Proposition 1, to enhance their ability to support critical aquatic needs. Second, there are opportunities to partner with the State and Federal water projects in coordinated operations that will enhance fishery protections associated with their operations. Beyond these enhancements, the Project itself is being designed to avoid and lessen any environmental concerns and, when necessary, provide appropriate mitigation. The Revised Draft EIR/Supplemental Draft EIS Executive Summary (available here [sitesproject.org/environmental-review](http://sitesproject.org/environmental-review)) summarizes the environmental effects that have been identified, including those that are significant and unavoidable.

**How much water will Sites take from the Trinity River? Or how will Sites impact the Trinity River?**

No water will be diverted from the Trinity River to fill Sites Reservoir. The unique location of the reservoir means the Project is not competing for other water resources. Instead the Sites Reservoir will be complementary to these facilities and enhance the ability to optimize the limited water resources.

All water diverted into Sites Reservoir will come from the Sacramento River, primarily from the streams

and creeks that flow into the river downstream of the Shasta and Keswick Dams, with the exception of extreme events where Shasta Dam is releasing water to avoid flooding in which case some of this released water may be diverted into Sites.

**Will the project harm fish species in the Sacramento-San Joaquin Delta?**

No. Sites Reservoir does not threaten salmon and other fish. In fact, there are highly protective operating conditions in place that must be in place before diversions into Sites Reservoir can proceed, including adapting to evolving conditions. In addition, the intakes being used for diverting water into Sites Reservoir include state-of-the-art fish screens that are proven to be highly effective at protecting fish. And, the current proposed project includes more cold water for salmon in the driest years when it is needed most. Not only is no harm done, but there is also a net benefit from this project to Sacramento River salmon, Delta smelt, and the Sacramento-San Joaquin Delta estuary.

**Has the Sites Project Authority analyzed and considered a comprehensive range of environmental mitigation and protections to support salmon and the Bay-Delta ecosystem?**

Absolutely, and there are a couple of specific elements of the Project that are critical to supporting environmental needs. First, the State has made a large investment in the Project through Proposition 1 to enhance their ability to support these critical systems. Second, there are opportunities to partner with the State and Federal water projects in coordinated operations that will enhance fishery protections associated with their operations. Beyond these enhancements, the Project itself is being designed to avoid and lessen any environmental concerns and, when necessary, provide appropriate mitigation.

**How does Sites address temperature management efforts for salmon protection?**

All species have varying needs throughout their lives. Suitable water temperatures for cold-water fish are important but not the only important component. They need food to sustain and grow along with places to take cover and rest while

migrating to the ocean among other things. While temperature management alone does not meet all of the needs of cold-water fish, it is an important component.

Sites has been shown to have the ability to assist in the Bureau of Reclamation's temperature management efforts for salmon protection in the Sacramento and American River systems through water exchanges. The Bureau of Reclamation would establish the criteria for these exchanges through its temperature management planning which weighs risks and rewards of various potential protective actions. Sites is a potential tool for use in managing temperature but is not limited to serving this purpose only. Sites provides additional benefits to the environment, including assisting in providing stability for flows in the fall to reduce salmon redd dewatering, providing additional food resources for Delta smelt in the north Delta, among other existing and potential benefits. It would be shortsighted to conclude that the federal government should not invest in Sites based on conclusions about current temperature management efforts being less than optimal. The fact is that Sites creates new water supply for drier periods and flexibility to deal with uncertainty of climate change. Both of these attributes are beneficial to the environment and worthy of federal investment.

#### **Is Sites being built on native lands? How will it impact tribal people?**

Both the Sites Project Authority and the Bureau of Reclamation have consulted and will continue to consult with recognized Native American Tribes regarding impacts to Tribal people and resources. This is described in detail in Chapter 23 and Chapter 29 of the Revised Draft EIR/Supplemental Draft EIS. The Authority has reached out to over a dozen Tribes under Assembly Bill 52 and is in ongoing consultation under AB 52 with several tribes. There are Native American human remains and other tribal resources in the footprint of the reservoir and the Authority is working closely with the Tribes that historically inhabited the reservoir footprint to address impacts to these resources and ensure Native American human remains are addressed consistent with the Tribes' requests. As described in Chapter 29 of the Revised Draft EIR/Supplemental Draft EIS, the Project does not occur in an area that would affect Indian hunting or water rights nor is the alternative on Indian trust lands.

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#### **How were the RDEIR/SDEIS virtual public meetings announced?**

A variety of notification methods and channels were used to announce the virtual public meetings,

availability of the RDEIR/SDEIS, and public comment period, including:

- Authority's Notice of Availability emailed to agencies, Tribes, NGOs, and interested parties
- Reclamation's Notice of Availability published in the Federal Register
- Press release disseminated to media outlets
- Notices posted to the Authority and Reclamation's websites
- Numerous Authority and Reclamation social media posts

- Advertisement published in eight local area newspapers
- Direct mailing to landowners and interested parties
- A series of email blasts to interested public members

To receive future project updates, sign up to be added to the Authority's email list here:  
[Contact - Sites Reservoir \(sitesproject.org\)](http://sitesproject.org).



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*(continued)*

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**Technical Meeting**  
**Two Add'l 250-cfs, 600 hp Pumps at Red Bluff Pumping Plant**

**July 26, 2022**

**Agenda**

1. Welcome and Introductions
2. Brief Project Description – Sites Project Authority
  - a. Overview of project location and facilities
  - b. High-level schedule and timing
3. Two 600 hp, 250 cfs pumps

**Section 2.5.1.1 of RDEIR/SDEIS, RBPP.** The Project would entail the installation of two additional 250-cfs, 600 horsepower (hp) vertical axial-flow pumps into existing concrete pump bays at the RBPP. The addition of these two pumps would increase the capacity from 2,000 to 2,500 cfs, as well as provide redundancy...The installation of the additional pumps at the RBPP would require limited construction equipment and personnel and would require only a few months of onsite construction, thereby allowing for flexibility on the timing of construction.

- a. Who's going to own the pumps?
  - b. Who's going to operate, maintain and replace the pumps?
  - c. Who's going to provide power to the pumps?
4. Action Items

## **Selected FAQs from Sites Project Website Related to Areas of Concern Previously Expressed by Tribal Interests**

### **How much water will Sites take from the Trinity River? Or how will Sites impact the Trinity River?**

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### **Has the Sites Project Authority analyzed and considered a comprehensive range of environmental mitigation and protections to support salmon and the Bay-Delta ecosystem?**

Absolutely, and there are a couple of specific elements of the Project that are critical to supporting environmental needs. First, the State has made a large investment in the Project through Proposition 1 to enhance their ability to support these critical systems. Second, there are opportunities to partner with the State and Federal water projects in coordinated operations that will enhance fishery protections associated with their operations. Beyond these enhancements, the Project itself is being designed to avoid and lessen any environmental concerns and, when necessary, provide appropriate mitigation.

### **How does Sites address temperature management efforts for salmon protection?**

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**Will Sites Reservoir divert water from the Sacramento River even during critically dry years?**

It depends. Even during drier years there can be significant precipitation events that present conditions where water can be diverted safely from the river and placed in Sites Reservoir. All diversions will be subject to the highly protective operating conditions that are currently being proposed and will ultimately be permitted by State and Federal regulatory agencies for the Sites Reservoir Project.

**Will Sites Reservoir decrease Delta flows?**

Yes, slightly, when the Project is diverting. However, since the Sites Reservoir diversions occur only when there are high river flows, any reduction to Delta flows would be minor and would not impact any of the beneficial uses of the water in the Delta. Storing water in Sites Reservoir during times when there is a lot of flow in the Sacramento River for use during times with the flows are low, including during drought periods, is part of the statewide strategy for adapting to changing climate conditions and to return much needed flexibility to the statewide water management system.

### **Have concerns about the impact of Sites Reservoir operations on the environment been addressed in the current proposal?**

The Project operations have been modified substantially over the last two years to be more protective of the environment. These modifications have reduced the Project diversions from the Sacramento River substantially, in fact diversions have been reduced almost in half, as compared to the criteria proposed in 2017. The current Project operations strikes the needed balance between environmental protections and Project affordability that must exist for the Project to proceed.

### **Who profits from Sites Reservoir?**

The Sites Reservoir Project is led by a Joint Powers Authority made up of irrigation agencies, water districts, cities, and counties in the Sacramento Valley area. The Project is being developed on a beneficiary pays principle which means that the benefits received are paid for by those receiving the benefits. The beneficiaries of the Project include the federal government, state government, and local public agencies. The water generated by the Project will be used for agriculture, meeting water demands of businesses and residents, and serving the needs of the environment throughout California.

### **Is Sites Reservoir a private reservoir?**

No. Sites Reservoir is funded 100 percent by local, state, and federal public dollars. There are environmental, recreational and flood control benefits – as well new dry year water supplies secured for public agency ratepayers throughout California. Participation in Sites is broad and diverse, including the Bureau of Reclamation, State of California, urban areas of Southern California and the Bay Area, as well as public irrigation districts in the Sacramento Valley and San Joaquin Valley

### **Does Sites Reservoir need new Delta conveyance?**

No. The project is not dependent on the construction of Delta tunnels. Sites Reservoir will function independently, with or without a new Delta conveyance system. The Draft Environmental Impact Report/Statement evaluates Sites Reservoir as a standalone project.

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**File Provided Natively**







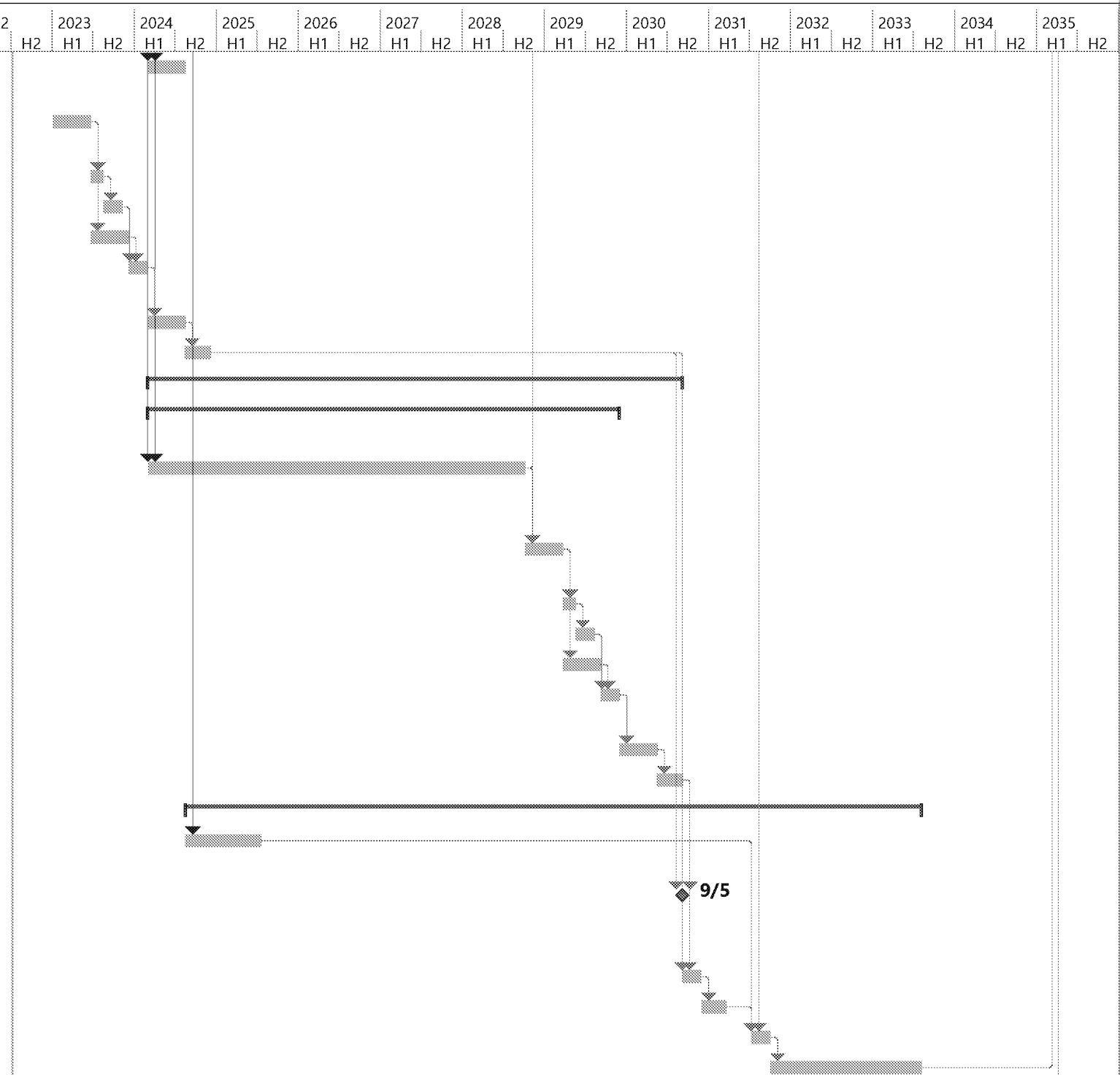
ID	Task Name	Duration	Start	Finish	Predecessors	Successors	2022		2023		2024		2025		2026		2027		2028		2029		2030		2031		2032		2033		2034		2035	
							H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	H1
79	Bidding and Contract Execution for I/O Package	4 mons	Mon 11/30/26	Fri 3/19/27	76,87	81																												
80	Obtain Property Rights for I/O Construction	24 mons	Fri 8/16/24	Thu 6/18/26	5	82,81																												
81	I/O Mobilization	3 mons	Mon 3/22/27	Fri 6/11/27	80,79,14	82																												
82	I/O Construction	36 mons	Mon 6/14/27	Fri 3/15/30	81,80,77	88,123																												
83	<b>DSOD Reviews</b>	<b>2200 days</b>	<b>Mon 1/29/24</b>	<b>Fri 7/2/32</b>																														
84	DSOD Review of 30% Design	3 mons	Mon 1/29/24	Fri 4/19/24	39,63	42,66																												
85	DSOD Review of 60% Design	3 mons	Mon 12/2/24	Fri 2/21/25	44,68	47,71																												
86	DSOD Review of 90% Design	3 mons	Mon 11/3/25	Fri 1/23/26	48,72	51,75																												
87	DSOD Approval of 100% Design	3 mons	Mon 9/7/26	Fri 11/27/26	51,76	54,79																												
88	DSOD Approves Completed Construction	3 mons	Mon 4/12/32	Fri 7/2/32	57,82	123																												
89	<b>Conveyance</b>	<b>2140 days</b>	<b>Mon 1/3/22</b>	<b>Fri 3/15/30</b>																														
90	<b>30% Design</b>	<b>720 days</b>	<b>Mon 1/3/22</b>	<b>Fri 10/4/24</b>																														
91	Initiate and progress 30% Design	12 mons	Mon 1/3/22	Fri 12/2/22		96,94,95																												
92	Access rights for conveyance geotech	7 mons	Mon 12/5/22	Fri 6/16/23	95	93																												
93	Geotech exploration for 30% design	6 mons	Mon 6/19/23	Fri 12/1/23	92	96																												
94	CA ISO Reviews Electrical System Study	24 mons	Mon 12/5/22	Fri 10/4/24	91	106,101FF																												
95	Select TRR alternative	0 days	Fri 12/2/22	Fri 12/2/22	91	96,92																												
96	Complete 30% design	6 mons	Mon 12/4/23	Fri 5/17/24	93,91,95	97																												
97	<b>60% Design</b>	<b>120 days</b>	<b>Mon 5/20/24</b>	<b>Fri 11/1/24</b>	<b>96</b>																													
98	Initiate and progress 60% Design	6 mons	Mon 5/20/24	Fri 11/1/24		99SS																												
99	Geotech exploration for 60% design	3 mons	Mon 5/20/24	Fri 8/9/24	98SS	100																												
100	Complete 60% design	2 mons	Mon 8/12/24	Fri 10/4/24	99	101																												
101	<b>Complete Conveyance Design</b>	<b>12 mons</b>	<b>Mon 10/7/24</b>	<b>Fri 9/5/25</b>	<b>100,94FF</b>	<b>103</b>																												
102	<b>Conveyance Construction</b>	<b>1456 days</b>	<b>Fri 8/16/24</b>	<b>Fri 3/15/30</b>																														
103	Bidding and Contract Negotiations for	4 mons	Mon 9/8/25	Fri 12/26/25	101	105																												
104	Obtain Property Rights for Conveyance	24 mons	Fri 8/16/24	Thu 6/18/26	5	105																												

Project: Sites - Contract Strateg  
Date: Thu 7/7/22

Task		Inactive Task		Manual Summary Rollup		External Milestone		Manual Progress	
Split		Inactive Milestone		Manual Summary		Deadline			
Milestone		Inactive Summary		Start-only		Critical			
Summary		Manual Task		Finish-only		Critical Split			
Project Summary		Duration-only		External Tasks		Progress			



ID	Task Name	Duration	Start	Finish	Predecessors	Successors	2022		2023		2024		2025		2026		2027		2028		2029		2030		2031		2032		2033		2034		2035	
							H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	H1
131	Determine if upstream segment should be	6 mons	Fri 3/1/24	Thu 8/15/24	4,3																													
132	Access rights for geotech exploration and survey	6 mons	Wed 1/4/23	Tue 6/20/23		133,135																												
133	Survey	2 mons	Wed 6/21/23	Tue 8/15/23	132	134																												
134	Initiate 30% design	3 mons	Wed 8/16/23	Tue 11/7/23	133	136																												
135	Geotech exploration and	6 mons	Wed 6/21/23	Tue 12/5/23	132	136																												
136	Complete 30% design of upstream segment	3 mons	Wed 12/6/23	Tue 2/27/24	135,134	137																												
137	<b>60% design upstream segment</b>	<b>6 mons</b>	<b>Wed 2/28/24</b>	<b>Tue 8/13/24</b>	<b>136</b>	<b>138</b>																												
138	<b>90% design upstream segment</b>	<b>4 mons</b>	<b>Wed 8/14/24</b>	<b>Tue 12/3/24</b>	<b>137</b>	<b>152,151</b>																												
139	<b>Downstream segment</b>	<b>1700 days</b>	<b>Fri 3/1/24</b>	<b>Thu 9/5/30</b>																														
140	<b>30% design downstream segment</b>	<b>1500 days</b>	<b>Fri 3/1/24</b>	<b>Thu 11/29/29</b>																														
141	Determine if downstream segment discharges to Colusa Basin Drain or Sac	60 mons	Fri 3/1/24	Thu 10/5/28	4,3	142,30																												
142	Access rights for geotech exploration and survey	6 mons	Fri 10/6/28	Thu 3/22/29	141	143,145																												
143	Survey	2 mons	Fri 3/23/29	Thu 5/17/29	142	144																												
144	Initiate 30% design	3 mons	Fri 5/18/29	Thu 8/9/29	143	146																												
145	Geotech exploration and	6 mons	Fri 3/23/29	Thu 9/6/29	142	146																												
146	Complete 30% design of downstream segment	3 mons	Fri 9/7/29	Thu 11/29/29	145,144	147																												
147	<b>60% design downstream segment</b>	<b>6 mons</b>	<b>Fri 11/30/29</b>	<b>Thu 5/16/30</b>	<b>146</b>	<b>148</b>																												
148	<b>90% design downstream segment</b>	<b>4 mons</b>	<b>Fri 5/17/30</b>	<b>Thu 9/5/30</b>	<b>147</b>	<b>152,151</b>																												
149	<b>Complete design and construction</b>	<b>2340 days</b>	<b>Fri 8/16/24</b>	<b>Thu 8/4/33</b>																														
150	Obtain Property rights for Dunnigan Pipeline	12 mons	Fri 8/16/24	Thu 7/17/25	5	154																												
151	Last date to combine upstream and downstream segments for construction	0 days	Thu 9/5/30	Thu 9/5/30	148,138																													
152	100% design for both segments	3 mons	Fri 9/6/30	Thu 11/28/30	148,138	153																												
153	Bid and execute contract	4 mons	Fri 11/29/30	Thu 3/20/31	152	154																												
154	Dunnigan Pipeline Mobilization	3 mons	Fri 7/11/31	Thu 10/2/31	153,150,33	155																												
155	Dunnigan Pipeline Construction	24 mons	Fri 10/3/31	Thu 8/4/33	154	125																												



Project: Sites - Contract Strategy Date: Thu 7/7/22	Task		Inactive Task		Manual Summary Rollup		External Milestone		Manual Progress	
	Split		Inactive Milestone		Manual Summary		Deadline			
	Milestone		Inactive Summary		Start-only		Critical			
	Summary		Manual Task		Finish-only		Critical Split			
	Project Summary		Duration-only		External Tasks		Progress			

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**From:** Heydinger, Erin [Erin.Heydinger@hdrinc.com]  
**Sent:** 7/12/2022 4:09:12 PM  
**To:** Alicia Forsythe [aforsythe@sitesproject.org]  
**CC:** Patel, Trishna [Trishna.Patel@hdrinc.com]  
**Subject:** RE: Sites Reservoir - Prop 1 Benefit Agreement Process/Contents

Hi Ali,

We took a cut at modifying the “process” based on Paige’s email. It’s linked here with the edits in track changes so you can see what’s different.

Link: [BenefitAgreementProcess\\_Updated.docx](#)

We have our follow-up meeting with Jessica tomorrow. It sounds like she is okay with the changes Paige proposed. We can talk through that with her and also walk through the outline for flood reduction. Let us know if there’s anything else we should prepare for tomorrow. I figure that afterwards, we should go through the staff report and make sure everything is consistent with the latest thinking.

Trishna has drafted a closed session PowerPoint that I need to review. We can discuss it with Jerry as well on Friday – we have a call set up for 10 am. I’ll try to get you the presentation by the end of the day tomorrow so you have time to look at it before we meet with Jerry.

Thanks!  
Erin

Erin Heydinger PE, PMP  
D 916.679.8863 M 651.307.9758

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---

**From:** Heydinger, Erin  
**Sent:** Tuesday, July 12, 2022 9:38 AM  
**To:** Uttley, Paige@Wildlife <Paige.Uttley@wildlife.ca.gov>; Boyt, Jessica@DWR <Jessica.Boyt@water.ca.gov>  
**Cc:** Alicia Forsythe <aforsythe@sitesproject.org>; Patel, Trishna <Trishna.Patel@hdrinc.com>  
**Subject:** RE: Sites Reservoir - Prop 1 Benefit Agreement Process/Contents

Hi Paige,

Thanks for your message. On the “standard language” – based on discussions with Jessica, the thought was that these sections would be fairly clear-cut and DWR/CDFW would want to have the same language throughout each contract. We were thinking here that most of the substantial project-specific information, and possibly the more complex concepts related to realizing benefits, would be contained in the other sections of the agreement. The other sections might also include the principles identified “Principles Document.” That said, if we missed the mark here or you think we should remove some of the sections identified, we are certainly fine with that – we want our report-out to be as accurate as possible.

We will take a cut at adjusting the process as you note below and will send it back over to you to be sure we are accurately reflecting the edits you suggest.

Thanks again, and we really appreciate any input you can provide on the Staff Report (we’ll be sure it reflects your note below as well).

Best,  
Erin

Erin Heydinger PE, PMP  
D 916.679.8863 M 651.307.9758

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---

**From:** Uttley, Paige@Wildlife <Paige.Uttley@wildlife.ca.gov>  
**Sent:** Friday, July 8, 2022 1:52 PM  
**To:** Heydinger, Erin <Erin.Heydinger@hdrinc.com>; Boyt, Jessica@DWR <Jessica.Boyt@water.ca.gov>  
**Cc:** Alicia Forsythe <aforisythe@sitesproject.org>; Patel, Trishna <Trishna.Patel@hdrinc.com>  
**Subject:** RE: Sites Reservoir - Prop 1 Benefit Agreement Process/Contents

CAUTION: [EXTERNAL] This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi Erin,

We are looking over the attached document now and I will aim to get comments back to you by the 12<sup>th</sup>.

Re the workflow process identified below- I'm checking with our legal counsel but I'm not sure all of the listed sections will be included in individual administering agency contracts or that it "will primarily use standard language from DWR/CDFW"- perhaps you could clarify what you mean here by standard language? We did receive the Prop 1 Proponents Concepts for Public Benefits Contract (Principles Document) June 14, 2022, and I believe, have committed to presenting a draft contract and adaptive management plan general template to the round table by the end of this month/ early next month which should present some draft language pursuant some of the sections you identify.

Regarding the Draft Contract Review Process, your general statement seems accurate. I would add that we now know administering agencies will present our draft public benefits contracts to the Commission at the same time (i.e., for CWC Contract Review). Therefore, this period will also include coordination between public benefit administering agencies to ensure draft contract language is consistent, where appropriate. Additionally, components previously identified under 'contract execution' will now move to this phase. Specifically, administering agencies will likely need confirmation of any permits, agreements, contracts, etc. necessary for administration of a public benefit at this time so that we can complete and present our quantification and finding of net benefit for the CWC Contract Review.

Regarding CWC Contract Review- I encourage you to reach out to Amy Young as I know CWC staff have updated their process. I would just specify here that the public is providing comments to the Commission.

Final Contract Review- during this period, any comments received from the Commission (or via the public to the Commission) may be incorporated into the contract, as relevant, and the final public benefits contract would be reviewed and approved by both the project board and CDFW executive, as you've stated. [Contract Execution] It is at this point the agencies would confirm that the final public benefits being contracted for meet all requirements specified in Water Code section 79750 et seq., and subsequently, the public benefits contract could be executed. As you note- this process may have a longer timeline due to your internal board meetings but may also be affected by the amount and extent of edits required prior to execution. Note: If there are considerable changes between the draft contract presented to the CWC for review and the final draft I do not know what that means with regards to the Commissions' process (i.e., would they want to have a follow-up presentation/ review period or not?). I think the goal is to have a pretty 'final' version of the contract ahead of the CWC Review period above.

Therefore, the Contract Execution phase is no longer quite as you have described. The next phase would be the 'WSIP Final Award' or 'WSIP Execution' phase. Again, I suggest checking in with Amy Young on the processes/ requirements here. However, it is my understanding that it would be at this point Sites would need to have/demonstrate final environmental documentation and all federal, state, and local approvals, certifications, and agreements (additional but inclusive of those necessary for agency benefit contract execution, described above) pursuant the regulations, as well as their executed public benefits contracts.

Hope this helps,

Draft\_0018458

Paige

**Paige Uttley** | Senior Environmental Scientist, Water Branch | California Department of Fish & Wildlife  
Cell (916) 698-1140 | [Paige.Uttley@wildlife.ca.gov](mailto:Paige.Uttley@wildlife.ca.gov)

---

**From:** Heydinger, Erin <Erin.Heydinger@hdrinc.com>  
**Sent:** Thursday, July 7, 2022 3:51 PM  
**To:** Uttley, Paige@Wildlife <Paige.Uttley@wildlife.ca.gov>; Boyt, Jessica@DWR <Jessica.Boyt@water.ca.gov>  
**Cc:** Alicia Forsythe <aforsythe@sitesproject.org>; Patel, Trishna <Trishna.Patel@hdrinc.com>  
**Subject:** Sites Reservoir - Prop 1 Benefit Agreement Process/Contents

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WARNING: This message is from an external source. Verify the sender and exercise caution when clicking links or opening attachments.

Hi Paige and Jessica,

The Sites team is going to be bringing an update to the July meeting of the Authority Board on the Prop 1 benefit agreement process and contract contents. We are hoping you can take a quick look at the draft staff report (attached) and let us know if you have any comments/edits or if anything does not align with your thinking on the agreements. The contents are based on the Public Benefit Contract Workflow document Paige sent over as well as a recent meeting with Jessica on the DWR agreement.

We were also hoping you could review the paragraphs below to make sure we're on the right track for the overall process and timeline. There's a bit more detail on the process than is included in the staff report.

If at all possible, we'd appreciate any comments from you by the end of the day Tuesday, the 12<sup>th</sup>.

Thank you!

Erin

#### **Development of Draft Contract (approximately 3 months)**

All projects funded under the WSIP must enter into contracts with each appropriate State agency. The contracts created will supersede any commitments made in the WSIP application involving preliminary operations, monitoring, and management of the reservoir. The contents of the contracts are expected to be those identified in the "CAPB Workflow" document. The following sections will primarily use standard language from DWR/CDFW:

- Recitals
- Definitions
- Authority
- Term
- Right of entry
- Failure to comply with contract agreement
- Effect of contract agreement
- Breach of contract
- General terms and conditions
- Force majeure
- Process for amending and modifying contract

#### **Draft Contract Review Process (approximately 2 months)**

Draft\_0018459

This process involves the review of the drafted benefit agreements by DWR/CDFW, Project board, and legal team. Once circulated, the drafts are to be edited by Sites Authority until approval is received by all reviewing parties. The time for completion of this process is dependent on the amount and extent of the edits required.

**CWC Contract Review (approximately 2 months)**

The public will be provided the opportunity to review the contract and provide comments. Additionally, the CWC is to review the contract and respond with comments.

**Final Contract Review (approximately 2 months)**

The final contract must be reviewed and approved by both the project board and a DWR/CDFW executive. This process may have a longer timeline due to internal board meetings.

**Contract Execution (approximately 2 months)**

During this process, the administering agencies will confirm that the public benefits currently meet all requirements that are specified in Water Code section 79750 et seq. This is especially necessary in the event that the amount of public benefits changes between the time that the agencies' findings are reviewed and the Sites Authority enter into a contract with the agency. The required final environmental documentation and all federal, state, and local approvals, certifications, and agreements are to be confirmed, as well. Evidence is to be provided that the project has obtained the final draft public benefit contracts with each agency that is responsible for administering the public benefit.

*Erin Heydinger, PE, PMP  
Project Manager - Water*

**HDR**  
2379 Gateway Oaks Dr, #200  
Sacramento, CA 95833  
D 916.679.8863 M 651.307.9758

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**From:** Uttley, Paige@Wildlife [Paige.Uttley@wildlife.ca.gov]  
**Sent:** 7/12/2022 4:38:54 PM  
**To:** Boyt, Jessica@DWR [Jessica.Boyt@water.ca.gov]; Heydinger, Erin [erin.heydinger@hdrinc.com]  
**CC:** Alicia Forsythe [aforsythe@sitesproject.org]; Patel, Trishna [Trishna.Patel@hdrinc.com]; Miller, Kathleen A.@Wildlife [Kathleen.Miller@Wildlife.ca.gov]  
**Subject:** RE: Sites Reservoir - Prop 1 Benefit Agreement Process/Contents

Hi Erin,

Thanks for the clarity on standard language. I do foresee there being some standard language across all CDFW WSIP contracts with additional sections specific to each project, as you've noted. As to the consistency between agencies, I agree with Jessica that we will try and coordinate but there may be some differences between the agency contracts, and this will just be dependent on our legal counsel and executive review. The contract templates being developed in response to the principles document should hopefully bring clarity as to which specific sections will be included in our contract and which may not.

Regarding the Reservoir Committee Agenda, I have the following comments for your consideration:

Pg 1. The required information included in the agreements can be summarized as follows-Bullet 1: A description of the public benefit will be required, which should include the details such as quantity, timing, implementation activities/operations required, etc. of each benefit being contracted for. However, CDFW will be quantifying the net benefit and presenting our findings to the Commission for their review with the draft CAPB. While we will need to be in agreement as to what specifically Sites is contracting for, I am not sure the 'process taken to quantify the net benefit' will be included in the CAPB contract itself.

Bullet 4: We will have an adaptive management plan as part of the CAPB which will outline in detail what thresholds, triggers, monitoring metrics, etc will be used for adaptive management of each benefit as well as discuss the decision-making process if the benefit is not being achieved. This adaptive management outline will also be share with the round table as part of the CAPB contract.

Bullet 5: I'm not sure what steps the Authority will take should they fail to comply with the contract... however, there will be a process identified in the CAPB (and Adaptive Management Plan) if a trigger is hit, or if the project does not want to comply with adaptive management recommendations, etc.

CDFW is in coordination with DWR and SWRCB. However, we [CDFW] are preparing the outline based on the public ecosystem benefits and I am not sure if *all* agreements will follow this same outline or simply be similar to one another. I also do not know if we will have standard terms across all agreements- we will work to ensure our terms do not conflict with one another and try to coordinate where it makes sense, however the different agencies are contracting for different benefits and therefore may need to vary their contracts accordingly.

Pg 2: We can strive to complete our public benefits agreement by next summer (2023) however we will need Sites/ the Authority to have obtained all relevant permits and agreements for administration of benefits prior to CWC Contract review (i.e., ITPs, Water Rights, Final CEQA) as terms and conditions included in these may impact benefit implementation/ administration included in the CAPB.

Please see my previous comments re the Process.

Thanks,  
Paige

---

**From:** Boyt, Jessica@DWR <Jessica.Boyt@water.ca.gov>  
**Sent:** Tuesday, July 12, 2022 10:06 AM  
**To:** Heydinger, Erin <erin.heydinger@hdrinc.com>; Uttley, Paige@Wildlife <Paige.Uttley@wildlife.ca.gov>

**Cc:** Alicia Forsythe <aforsythe@sitesproject.org>; Patel, Trishna <Trishna.Patel@hdrinc.com>

**Subject:** RE: Sites Reservoir - Prop 1 Benefit Agreement Process/Contents

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All,

I'm going to defer to CDFW for the comments on this. Their comments have been very helpful so far and I will do my best to keep our process and contracts consistent with CDFW's. Hopefully, this will make things easier and more user friendly in the long run.

On the "standard language"- DWR's contracts will have sections with standard language across our contracts it may/or may not be the same as CDFW's. But again, we will try to keep things consistent with CDFW to make things easier and more user friendly.

Thanks,

Jessica Boyt  
Senior Environmental Scientist -Specialist

Department of Water Resources  
Northern Region Office  
2440 Main Street Red Bluff, CA 96080  
(530) 868-8054  
[Jessica.Boyt@water.ca.gov](mailto:Jessica.Boyt@water.ca.gov)



*California remains in a severe drought! Save Water. Learn more at [www.saveourwater.com](http://www.saveourwater.com).*

---

**From:** Heydinger, Erin <[Erin.Heydinger@hdrinc.com](mailto:Erin.Heydinger@hdrinc.com)>

**Sent:** Tuesday, July 12, 2022 9:38 AM

**To:** Uttley, Paige@Wildlife <[Paige.Uttley@wildlife.ca.gov](mailto:Paige.Uttley@wildlife.ca.gov)>; Boyt, Jessica@DWR <[Jessica.Boyt@water.ca.gov](mailto:Jessica.Boyt@water.ca.gov)>

**Cc:** Alicia Forsythe <aforsythe@sitesproject.org>; Patel, Trishna <Trishna.Patel@hdrinc.com>

**Subject:** RE: Sites Reservoir - Prop 1 Benefit Agreement Process/Contents

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Draft\_0018462

remove some of the sections identified, we are certainly fine with that – we want our report-out to be as accurate as possible.

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Thanks again, and we really appreciate any input you can provide on the Staff Report (we'll be sure it reflects your note below as well).

Best,  
Erin

Erin Heydinger PE, PMP  
D 916.679.8863 M 651.307.9758

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---

**From:** Uttley, Paige@Wildlife <[Paige.Uttley@wildlife.ca.gov](mailto:Paige.Uttley@wildlife.ca.gov)>

**Sent:** Friday, July 8, 2022 1:52 PM

**To:** Heydinger, Erin <[Erin.Heydinger@hdrinc.com](mailto:Erin.Heydinger@hdrinc.com)>; Boyt, Jessica@DWR <[Jessica.Boyt@water.ca.gov](mailto:Jessica.Boyt@water.ca.gov)>

**Cc:** Alicia Forsythe <[aforsythe@sitesproject.org](mailto:aforsythe@sitesproject.org)>; Patel, Trishna <[Trishna.Patel@hdrinc.com](mailto:Trishna.Patel@hdrinc.com)>

**Subject:** RE: Sites Reservoir - Prop 1 Benefit Agreement Process/Contents

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Hope this helps,  
Paige

**Paige Uttley** | Senior Environmental Scientist, Water Branch | California Department of Fish & Wildlife  
Cell (916) 698-1140 | [Paige.Uttley@wildlife.ca.gov](mailto:Paige.Uttley@wildlife.ca.gov)

---

**From:** Heydinger, Erin <[Erin.Heydinger@hdrinc.com](mailto:Erin.Heydinger@hdrinc.com)>  
**Sent:** Thursday, July 7, 2022 3:51 PM  
**To:** Uttley, Paige@Wildlife <[Paige.Uttley@wildlife.ca.gov](mailto:Paige.Uttley@wildlife.ca.gov)>; Boyt, Jessica@DWR <[Jessica.Boyt@water.ca.gov](mailto:Jessica.Boyt@water.ca.gov)>  
**Cc:** Alicia Forsythe <[aforssythe@sitesproject.org](mailto:aforssythe@sitesproject.org)>; Patel, Trishna <[Trishna.Patel@hdrinc.com](mailto:Trishna.Patel@hdrinc.com)>  
**Subject:** Sites Reservoir - Prop 1 Benefit Agreement Process/Contents

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Erin

### **Development of Draft Contract (approximately 3 months)**

All projects funded under the WSIP must enter into contracts with each appropriate State agency. The contracts created will supersede any commitments made in the WSIP application involving preliminary operations, monitoring, and management of the reservoir. The contents of the contracts are expected to be those identified in the "CAPB Workflow" document. The following sections will primarily use standard language from DWR/CDFW:

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- Authority
- Term

- Right of entry
- Failure to comply with contract agreement
- Effect of contract agreement
- Breach of contract
- General terms and conditions
- Force majeure
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*Erin Heydinger, PE, PMP*  
*Project Manager - Water*

**HDR**  
2379 Gateway Oaks Dr, #200  
Sacramento, CA 95833  
D 916.679.8863 M 651.307.9758

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Meeting: **Sites Authority Board (AB), Coordination Committee**

---

Locations: Maxwell Project Office, 122 Old Highway 99W, Maxwell, CA 95955  
See below for alternate meeting locations.

---

Call in: **1-213-379-5743** Code: **703 288 727#** [Click here to join the meeting](#)

Committee Chair: Fritz Durst (AB Chair/Reclamation District 108)

Committee Vice-Chair: Jeff Sutton (AB Vice-Chair/Tehama-Colusa Canal Authority)

Staff Lead: Jerry Brown, Executive Director

## **AGENDA**

**Monday, July 18, 2022; 3:00 – 4:00 pm**

**NO ACTION or DECISION WILL BE TAKEN**

### **ROLL CALL & CALL TO ORDER:**

- Introductions
- Period for Public Comment

### **1. Discussion and Information Items:**

- 1.1 Board Meeting Agenda Planning
- 1.2 General Coordination Among Committees and Workgroups
  - 1.2.1 Meeting Procedures

### **2. Closed Session:**

- 2.1 Potential Litigation – Gov. Code Sec. 54956.9(d)(3)

### **3. Upcoming Meetings:**

**Reservoir Committee Meeting**  
Friday, July 22, 2022 (9:00 am – 12:00 pm)

**Authority Board Meeting**  
Wednesday, July 27, 2022 (1:00 – 4:00 pm)

**Coordination Committee**  
Thursday, August 15, 2022 (3:00 – 4:00 pm)

Virtual Information will be provided before all meetings at [Sitesproject.org](https://sitesproject.org).

**ADJOURN**

PERIOD OF PUBLIC COMMENT: Any person may speak about any subject of concern, provided it is within the jurisdiction of the Authority Board's Coordination Committee and is not already on today's agenda. The total amount of time allotted for receiving such public communication shall be limited to a total of 10 minutes per issue and each individual or group will be limited to no more than 3 minutes each within the 10 minutes allocated per issue. **Note:** No action shall be taken on comments made under this comment period.

ADA COMPLIANCE: Upon request, agendas will be made available in alternative formats to accommodate persons with disabilities. In addition, any person with a disability who requires a modification or accommodation to participate or attend this meeting may request necessary accommodation. Please make your request to the Board Clerk, specifying your disability, the format in which you would like to receive this Agenda and any other accommodation required no later than 24 hours before the start of the meeting.

**Alternate Meeting Locations:**

Davis Water District, 6505 Hillgate Road, Arbuckle, CA 95912

Glenn-Colusa Irrigation District, 344 East Laurel Street, Willows, CA 95988

Reclamation District 108, 975 Wilson Bend Road, Grimes, CA 95950

Tehama-Colusa Canal Authority, 5513 Highway 162, Willows, CA 95987

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**From:** Heydinger, Erin [Erin.Heydinger@hdrinc.com]  
**Sent:** 7/13/2022 8:56:37 AM  
**To:** Alicia Forsythe [aforsythe@sitesproject.org]  
**Subject:** RE: Request for NTP - Alt 2 additional modeling

Will do, but not sure on the amount. I think Joe said we can say the amount is still TBD, but they will stay under their current budget for that task until the amendment is signed. Was that your understanding or should I get a ballpark from Steve?

Erin

Erin Heydinger PE, PMP  
D 916.679.8863 M 651.307.9758

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---

**From:** Alicia Forsythe <aforsythe@sitesproject.org>  
**Sent:** Wednesday, July 13, 2022 8:53 AM  
**To:** Heydinger, Erin <erin.heydinger@hdrinc.com>  
**Subject:** RE: Request for NTP - Alt 2 additional modeling

CAUTION: [EXTERNAL] This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Thanks Erin. I just sent on the mod to Joe and Marcus to get them moving on that.

Yes, lets get a NTP to CH also. Can you draft this for Joe and I can send it on to him? Thinking the easier we make this for him, the quicker he can get this completed. It seems like it should be fairly straightforward – authorized to proceed with additional modeling for Alternative 2 for the purposes of the Final EIR/EIS in an amount up to XX and charged to Task XX.

Ali

-----  
Alicia Forsythe | Environmental Planning and Permitting Manager | Sites Project Authority | 916.880.0676 |  
[aforsythe@sitesproject.org](mailto:aforsythe@sitesproject.org) | [www.SitesProject.org](http://www.SitesProject.org)

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**From:** Heydinger, Erin <Erin.Heydinger@hdrinc.com>  
**Sent:** Wednesday, July 13, 2022 8:45 AM  
**To:** Alicia Forsythe <aforsythe@sitesproject.org>  
**Subject:** Request for NTP - Alt 2 additional modeling

Hi Ali,

Per our discussion on Monday, Jacobs modeling team will likely need an increase in their budget to provide modeling for Alternative 2. This scope of work includes the following:

- DSM2 for Alternative 2

- HEC5Q and RecTemp for Alternative 2

Running these models will allow us to better compare the updated Alternative 2 to the RDEIR/SDEIS and the Final EIR/EIS for Alts 1 and 3.

I have directed Steve to begin preparing an amendment, but since this work is critical to maintain the schedule I suggest we give them an NTP in the meantime. They will be billing the work under Task D23.03. This subtask will have a budget of \$567,690 after the no-cost-change amendment goes through. As of Jacobs' most recent invoice, they have billed \$420,704.75 so this amendment should be able to be processed prior that subtask going over budget.

Thanks,  
Erin

*Erin Heydinger, PE, PMP  
Project Manager - Water*

**HDR**  
2379 Gateway Oaks Dr, #200  
Sacramento, CA 95833  
D 916.679.8863 M 651.307.9758

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---

**Sent:** 7/13/2022 9:03:23 AM  
**To:** Heydinger, Erin [Erin.Heydinger@hdrinc.com]  
**Subject:** RE: Request for NTP - Alt 2 additional modeling

I thought it was really just the amount that they might spend between now and getting the no cost time extension completed – since that authorizes the scope and budget amount. So like 2 weeks of work – maybe \$40K?

Ali

-----  
Alicia Forsythe | Environmental Planning and Permitting Manager | Sites Project Authority | 916.880.0676 |  
[aforsythe@sitesproject.org](mailto:aforsythe@sitesproject.org) | [www.SitesProject.org](http://www.SitesProject.org)

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**From:** Heydinger, Erin <Erin.Heydinger@hdrinc.com>  
**Sent:** Wednesday, July 13, 2022 8:57 AM  
**To:** Alicia Forsythe <aforsythe@sitesproject.org>  
**Subject:** RE: Request for NTP - Alt 2 additional modeling

Will do, but not sure on the amount. I think Joe said we can say the amount is still TBD, but they will stay under their current budget for that task until the amendment is signed. Was that your understanding or should I get a ballpark from Steve?

Erin

Erin Heydinger PE, PMP  
D 916.679.8863 M 651.307.9758

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---

**From:** Alicia Forsythe <aforsythe@sitesproject.org>  
**Sent:** Wednesday, July 13, 2022 8:53 AM  
**To:** Heydinger, Erin <erin.heydinger@hdrinc.com>  
**Subject:** RE: Request for NTP - Alt 2 additional modeling

CAUTION: [EXTERNAL] This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Thanks Erin. I just sent on the mod to Joe and Marcus to get them moving on that.

Yes, lets get a NTP to CH also. Can you draft this for Joe and I can send it on to him? Thinking the easier we make this for him, the quicker he can get this completed. It seems like it should be fairly straightforward – authorized to proceed with additional modeling for Alternative 2 for the purposes of the Final EIR/EIS in an amount up to XX and charged to Task XX.

Ali

-----  
Alicia Forsythe | Environmental Planning and Permitting Manager | Sites Project Authority | 916.880.0676 |  
[aforsythe@sitesproject.org](mailto:aforsythe@sitesproject.org) | [www.SitesProject.org](http://www.SitesProject.org)

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---

**From:** Heydinger, Erin <[Erin.Heydinger@hdrinc.com](mailto:Erin.Heydinger@hdrinc.com)>  
**Sent:** Wednesday, July 13, 2022 8:45 AM  
**To:** Alicia Forsythe <[aforsythe@sitesproject.org](mailto:aforsythe@sitesproject.org)>  
**Subject:** Request for NTP - Alt 2 additional modeling

Hi Ali,

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- DSM2 for Alternative 2
- HEC5Q and RecTemp for Alternative 2

Running these models will allow us to better compare the updated Alternative 2 to the RDEIR/SDEIS and the Final EIR/EIS for Alts 1 and 3.

I have directed Steve to begin preparing an amendment, but since this work is critical to maintain the schedule I suggest we give them an NTP in the meantime. They will be billing the work under Task D23.03. This subtask will have a budget of \$567,690 after the no-cost-change amendment goes through. As of Jacobs' most recent invoice, they have billed \$420,704.75 so this amendment should be able to be processed prior that subtask going over budget.

Thanks,  
Erin

Erin Heydinger, PE, PMP  
*Project Manager - Water*

**HDR**  
2379 Gateway Oaks Dr, #200  
Sacramento, CA 95833  
D 916.679.8863 M 651.307.9758

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---

**From:** Marcia Kivett [MKivett@sitesproject.org]  
**Sent:** 7/13/2022 10:35:40 AM  
**To:** Ra'iatea Lohe [rlohe@res.us]  
**Subject:** Re: CPRA Request for Sites EIR/REIR GIS files

Let me look into this and get back to you.

Marcia Kivett  
Sites Project Coordinator  
561.843.9740  
[mkivett@sitesproject.org](mailto:mkivett@sitesproject.org)  
P.O. Box 517  
122 Old Hwy 99W  
Maxwell, CA 95955

---

**From:** Ra'iatea Lohe <rlohe@res.us>  
**Sent:** Wednesday, July 13, 2022 10:33 AM  
**To:** Marcia Kivett <MKivett@sitesproject.org>  
**Cc:** Records Request <recordsrequest@sitesproject.org>  
**Subject:** RE: CPRA Request for Sites EIR/REIR GIS files

Hi Marcia,

I received both emails but the folders upon downloading seem to be empty. Checking with our GIS Analyst she seems to think because the file extensions were both named ".gdb" and ".zip", she thinks if the GDBs are put in the folder and then the folder is zipped the transfer would work.

Best,  
Ra'iatea

---

**From:** Marcia Kivett <MKivett@sitesproject.org>  
**Sent:** Tuesday, July 5, 2022 7:14 AM  
**To:** Ra'iatea Lohe <rlohe@res.us>  
**Cc:** Records Request <recordsrequest@sitesproject.org>  
**Subject:** [EXTERNAL] Re: CPRA Request for Sites EIR/REIR GIS files

Good Morning,

We have uploaded the responsive records here - [☐PRR 22-02](#)

You should have received a separate email with the login information. It may have gone into your spam folder. Below is some information from our GIS Records Coordinator.

Below is a summary of what we have posted to that locations in response to the public records request. Thanks for all your support getting this together.

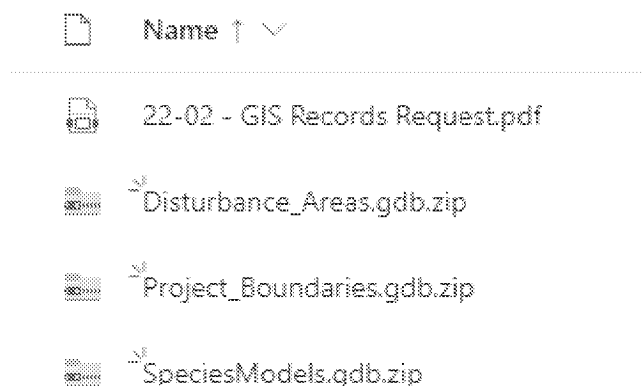
To review from the original request:

*I respectfully request access to the following GIS data in a digital format, preferably as **a file geodatabase**, or alternatively as shapefiles in a zipped folder, or as URLs to web services if applicable. **Please also include any metadata***

**produced with the layers, if available.** Layers are identified by their names in the legends of figures from the Revised EIR where possible and **by references to text if no maps were produced in the report.**

All data is provided in zipped file geodatabase format per the request. Metadata was available for the Disturbance Areas layer and is included. No metadata was available for the remaining layers

Here is a screenshot of the files.



**“Disturbance\_Areas.gdb.zip”** is the Permanent and Temporary disturbance area layer. This file is less than 1MB. File Geodatabase Format

- From Figure 2-38, Layers – Temporary and Permanent Disturbance Areas
  - Two source layers merged into one as recommended by AECOM metadata, attributes removed to reflect what is depicted in map.
  - Metadata provided includes a short summary of the file

**Summary**

Sites revised approximate environmental disturbance/impact features (both inside and outside reservoir limits) for Alternative 1. This data is preliminary and is subject to change.

This feature class contains the revised approximate environmental disturbance/impact areas (both inside and outside reservoir limits) for Alternative 1. features and a credit (AECOM) with source contact email (Alex Remar).

**“Project\_Boundaries.gdb.zip”** is the ICF provided layers for “Study Area”, “Recreation Areas”, and “Inundation Area”. This file is less than 1MB. File Geodatabase Format

- From Figure ES-5, Layer – Inundation Area
  - Accurately reflects layer depicted in map figure. No modifications made by HDR.
- From Figure ES-5, Layer – Recreation Areas
  - Removed day use area polygon and reduced attributes to reflect what is shown on the map.
- From Appendix 9B, Layers – Project Footprint and Study Area
  - Study area GIS layer accurately reflects layer depicted in map figure. No modifications made by HDR.

**“SpeciesModels.gdb.zip”** contain the ICF provided habitat models. They are unchanged. This file is about 86MB. File Geodatabase Format.

- From Appendix 10B, Layers – predicted habitat models
  - Confirmed that Layers referenced in Appendix 10B are all included (21 layers total). No maps were produced of these layers in Appendix 10B. No modifications made by HDR.

Name
<input type="checkbox"/> AmericanBadger_Habitat
<input type="checkbox"/> BaldEagle_Habitat
<input type="checkbox"/> BankSwallow_Habitat
<input type="checkbox"/> BumbleBee_Habitat
<input type="checkbox"/> BurrowingOwl_Habitat
<input type="checkbox"/> CRLF_Habitat
<input type="checkbox"/> GGS_Habitat
<input type="checkbox"/> GoldenEagle_Habitat
<input type="checkbox"/> Monarch_Habitat
<input type="checkbox"/> NorthernHarrier_Habitat
<input type="checkbox"/> PallidBat_LongEaredMyotis_Habitat
<input type="checkbox"/> SwainsonsHawk_WhiteTailedKite_Habitat
<input type="checkbox"/> TownsendsBat_SilverHairedBat_Habitat
<input type="checkbox"/> TricoloredBlackbird_Habitat
<input type="checkbox"/> VELA_Habitat
<input type="checkbox"/> VernalPool_Habitat
<input type="checkbox"/> WesternPondTurtle_Habitat
<input type="checkbox"/> WesternRedBat_Habitat
<input type="checkbox"/> WesternSpadefoot_Habitat
<input type="checkbox"/> YellowBilledCuckoo_DettlingModel
<input type="checkbox"/> YellowBreastedChat_YellowWarbler_Habitat

Please let us know if you have any issues accessing these or if you have any questions.

Marcia Kivett  
 Sites Project Coordinator  
 561.843.9740  
[mkivett@sitesproject.org](mailto:mkivett@sitesproject.org)  
 P.O. Box 517  
 122 Old Hwy 99W  
 Maxwell, CA 95955

---

**From:** Marcia Kivett <[MKivett@sitesproject.org](mailto:MKivett@sitesproject.org)>  
**Sent:** Friday, June 17, 2022 6:11 AM  
**To:** Ra'iatea Lohe <[rluhe@res.us](mailto:rluhe@res.us)>  
**Subject:** Re: CPRA Request for Sites EIR/REIR GIS files

Good Morning,

I wanted to send you an update on this request. We need to retrieve some of your request from a couple of our consultants. I do not think I will be able to provide the records today. I will keep you posted. Have a great day.

Marcia Kivett  
 Sites Project Coordinator  
 561.843.9740  
[mkivett@sitesproject.org](mailto:mkivett@sitesproject.org)  
 P.O. Box 517  
 122 Old Hwy 99W  
 Maxwell, CA 95955

**From:** Ra'iatea Lohe <[rlohe@res.us](mailto:rlohe@res.us)>  
**Sent:** Wednesday, June 15, 2022 2:21 PM  
**To:** Marcia Kivett <[MKivett@sitesproject.org](mailto:MKivett@sitesproject.org)>  
**Subject:** RE: CPRA Request for Sites EIR/REIR GIS files

Amazing thank you!

---

**From:** Marcia Kivett <[MKivett@sitesproject.org](mailto:MKivett@sitesproject.org)>  
**Sent:** Wednesday, June 15, 2022 2:20 PM  
**To:** Ra'iatea Lohe <[rlohe@res.us](mailto:rlohe@res.us)>  
**Cc:** Records Request <[recordsrequest@sitesproject.org](mailto:recordsrequest@sitesproject.org)>  
**Subject:** [EXTERNAL] Fw: CPRA Request for Sites EIR/REIR GIS files

Dear Ra'iatea:

Following up on your email below and our conversation last week, the Sites Project Authority has evaluated your request and determined that the records you requested are disclosable. We will be providing the data you requested. We expect to have the information available to you no later than Friday afternoon.

Thank you for your patience. Please let me know if you have any problems accessing the data.

Marcia Kivett  
Sites Project Coordinator  
561.843.9740  
[mkivett@sitesproject.org](mailto:mkivett@sitesproject.org)  
P.O. Box 517  
122 Old Hwy 99W  
Maxwell, CA 95955

---

**From:** Ra'iatea Lohe  
**Sent:** Monday, May 16, 2022 9:59 AM  
**To:** [recordsrequest@sitesproject.org](mailto:recordsrequest@sitesproject.org)  
**Subject:** CPRA Request for Sites EIR/REIR GIS files

Hello,

I respectfully request access to the following GIS data in a digital format, preferably as a file geodatabase, or alternatively as shapefiles in a zipped folder, or as URLs to web services if applicable. Please also include any metadata produced with the layers, if available. Layers are identified by their names in the legends of figures from the Revised EIR where possible and by references to text if no maps were produced in the report.

**EIR and REIR locations and files requested:**

**From Figure ES-5 (Alternatives 1 and 3 Regulating Reservoirs and Conveyance and Sites Reservoir Facilities)**

- Inundation Area
- Recreation Areas

**From Figure 2-38 (Onsite Borrow Area Details)**

- Temporary Disturbance Area
- Permanent Disturbance Area

**From Appendix 9B (Landcover Types in the Vegetation and Wetlands Study Area)**

- Project Footprint
- Study Area

**From Appendix 10B (Wildlife Habitat Models)**

- Final Predicted habitat model results for each of the species described in appendix 10B, presumably a raster layer showing likelihood of the presence of species in question or a vector layer indicating predicted presence for each species.

**From Figure 30-1A in Appendix 24A (Sites Reservoir Photo Locations)**

- Construction Disturbance area (if different from figure 2-38)

I do not anticipate needing any physical copies, but if any costs are incurred due to this request, please let me know via phone: 805-751-2151, or email: [rlohe@res.us](mailto:rlohe@res.us).

Best,  
Ra'iatea

Ra'iatea Lohe  
Solutions Analyst

**RES** | res.us  
D: (805)751-2151

---

**From:** Heydinger, Erin [Erin.Heydinger@hdrinc.com]  
**Sent:** 7/13/2022 1:30:25 PM  
**To:** Uttley, Paige@Wildlife [Paige.Uttley@wildlife.ca.gov]; Boyt, Jessica@DWR [Jessica.Boyt@water.ca.gov]  
**CC:** Alicia Forsythe [aforsythe@sitesproject.org]; Patel, Trishna [Trishna.Patel@hdrinc.com]; Miller, Kathleen A.@Wildlife [Kathleen.Miller@Wildlife.ca.gov]  
**Subject:** RE: Sites Reservoir - Prop 1 Benefit Agreement Process/Contents

Hi Paige,

This is helpful, thank you! No, the Sites project likely will not have all permits (such as the water right) completed by next summer. The objective here is not that we would receive construction funding by next summer but that the agreement itself would be substantially complete. With that in mind, would it make more sense if we identified that the target would be for the "Final Contract Review" to be complete by summer 2023, with execution following the reception of all permits/agreements? We did not realize when putting this together that the execution of the agreement would happen at the same time as the release of construction funds.

Thanks again for all of this great feedback!  
Erin

**Erin Heydinger** PE, PMP  
D 916.679.8863 M 651.307.9758

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---

**From:** Uttley, Paige@Wildlife <Paige.Uttley@wildlife.ca.gov>  
**Sent:** Tuesday, July 12, 2022 4:39 PM  
**To:** Boyt, Jessica@DWR <Jessica.Boyt@water.ca.gov>; Heydinger, Erin <erin.heydinger@hdrinc.com>  
**Cc:** Alicia Forsythe <aforsythe@sitesproject.org>; Patel, Trishna <Trishna.Patel@hdrinc.com>; Miller, Kathleen A.@Wildlife <Kathleen.Miller@Wildlife.ca.gov>  
**Subject:** RE: Sites Reservoir - Prop 1 Benefit Agreement Process/Contents

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Hi Erin,

Thanks for the clarity on standard language. I do foresee there being some standard language across all CDFW WSIP contracts with additional sections specific to each project, as you've noted. As to the consistency between agencies, I agree with Jessica that we will try and coordinate but there may be some differences between the agency contracts, and this will just be dependent on our legal counsel and executive review. The contract templates being developed in response to the principles document should hopefully bring clarity as to which specific sections will be included in our contract and which may not.

Regarding the Reservoir Committee Agenda, I have the following comments for your consideration:

Pg 1. The required information included in the agreements can be summarized as follows-Bullet 1: A description of the public benefit will be required, which should include the details such as quantity, timing, implementation activities/operations required, etc. of each benefit being contracted for. However, CDFW will be quantifying the net benefit and presenting our findings to the Commission for their review with the draft CAPB. While we will need to be in agreement as to what specifically Sites is contracting for, I am not sure the 'process taken to quantify the net benefit' will be included in the CAPB contract itself.

Bullet 4: We will have an adaptive management plan as part of the CAPB which will outline in detail what thresholds, triggers, monitoring metrics, etc will be used for adaptive management of each benefit as well as discuss the decision-making process if the benefit is not being achieved. This adaptive management outline will also be share with the round table as part of the CAPB contract.

Bullet 5: I'm not sure what steps the Authority will take should they fail to comply with the contract... however, there will be a process identified in the CAPB (and Adaptive Management Plan) if a trigger is hit, or if the project does not want to comply with adaptive management recommendations, etc.

CDFW is in coordination with DWR and SWRCB. However, we [CDFW] are preparing the outline based on the public ecosystem benefits and I am not sure if *all* agreements will follow this same outline or simply be similar to one another. I also do not know if we will have standard terms across all agreements- we will work to ensure our terms do not conflict with one another and try to coordinate where it makes sense, however the different agencies are contracting for different benefits and therefore may need to vary their contracts accordingly.

Pg 2: We can strive to complete our public benefits agreement by next summer (2023) however we will need Sites/ the Authority to have obtained all relevant permits and agreements for administration of benefits prior to CWC Contract review (i.e., ITPs, Water Rights, Final CEQA) as terms and conditions included in these may impact benefit implementation/ administration included in the CAPB.

Please see my previous comments re the Process.

Thanks,  
Paige

---

**From:** Boyt, Jessica@DWR <Jessica.Boyt@water.ca.gov>

**Sent:** Tuesday, July 12, 2022 10:06 AM

**To:** Heydinger, Erin <erin.heydinger@hdrinc.com>; Uttley, Paige@Wildlife <Paige.Uttley@wildlife.ca.gov>

**Cc:** Alicia Forsythe <aforsythe@sitesproject.org>; Patel, Trishna <Trishna.Patel@hdrinc.com>

**Subject:** RE: Sites Reservoir - Prop 1 Benefit Agreement Process/Contents

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All,

I'm going to defer to CDFW for the comments on this. Their comments have been very helpful so far and I will do my best to keep our process and contracts consistent with CDFW's. Hopefully, this will make things easier and more user friendly in the long run.

On the "standard language"- DWR's contracts will have sections with standard language across our contracts it may/or may not be the same as CDFW's. But again, we will try to keep things consistent with CDFW to make things easier and more user friendly.

Thanks,

Jessica Boyt  
Senior Environmental Scientist -Specialist

Department of Water Resources  
Northern Region Office  
2440 Main Street Red Bluff, CA 96080  
(530) 868-8054

[Jessica.Boyt@water.ca.gov](mailto:Jessica.Boyt@water.ca.gov)



California remains in a severe drought! Save Water. Learn more at [www.saveourwater.com](http://www.saveourwater.com).

---

**From:** Heydinger, Erin <[Erin.Heydinger@hdrinc.com](mailto:Erin.Heydinger@hdrinc.com)>  
**Sent:** Tuesday, July 12, 2022 9:38 AM  
**To:** Uttley, Paige@Wildlife <[Paige.Uttley@wildlife.ca.gov](mailto:Paige.Uttley@wildlife.ca.gov)>; Boyt, Jessica@DWR <[Jessica.Boyt@water.ca.gov](mailto:Jessica.Boyt@water.ca.gov)>  
**Cc:** Alicia Forsythe <[aforsythe@sitesproject.org](mailto:aforsythe@sitesproject.org)>; Patel, Trishna <[Trishna.Patel@hdrinc.com](mailto:Trishna.Patel@hdrinc.com)>  
**Subject:** RE: Sites Reservoir - Prop 1 Benefit Agreement Process/Contents

You don't often get email from [erin.heydinger@hdrinc.com](mailto:erin.heydinger@hdrinc.com). [Learn why this is important](#)

Thanks for your message. On the "standard language" – based on discussions with Jessica, the thought was that these sections would be fairly clear-cut and DWR/CDFW would want to have the same language throughout each contract. We were thinking here that most of the substantial project-specific information, and possibly the more complex concepts related to realizing benefits, would be contained in the other sections of the agreement. The other sections might also include the principles identified "Principles Document." That said, if we missed the mark here or you think we should remove some of the sections identified, we are certainly fine with that – we want our report-out to be as accurate as possible.

We will take a cut at adjusting the process as you note below and will send it back over to you to be sure we are accurately reflecting the edits you suggest.

Thanks again, and we really appreciate any input you can provide on the Staff Report (we'll be sure it reflects your note below as well).

Best,  
Erin

Erin Heydinger PE, PMP  
D 916.679.8863 M 651.307.9758

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---

**From:** Uttley, Paige@Wildlife <[Paige.Uttley@wildlife.ca.gov](mailto:Paige.Uttley@wildlife.ca.gov)>  
**Sent:** Friday, July 8, 2022 1:52 PM  
**To:** Heydinger, Erin <[Erin.Heydinger@hdrinc.com](mailto:Erin.Heydinger@hdrinc.com)>; Boyt, Jessica@DWR <[Jessica.Boyt@water.ca.gov](mailto:Jessica.Boyt@water.ca.gov)>  
**Cc:** Alicia Forsythe <[aforsythe@sitesproject.org](mailto:aforsythe@sitesproject.org)>; Patel, Trishna <[Trishna.Patel@hdrinc.com](mailto:Trishna.Patel@hdrinc.com)>  
**Subject:** RE: Sites Reservoir - Prop 1 Benefit Agreement Process/Contents

CAUTION: [EXTERNAL] This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Draft\_0018479

Hi Erin,

We are looking over the attached document now and I will aim to get comments back to you by the 12<sup>th</sup>.

Re the workflow process identified below- I'm checking with our legal counsel but I'm not sure all of the listed sections will be included in individual administering agency contracts or that it "will primarily use standard language from DWR/CDFW"- perhaps you could clarify what you mean here by standard language? We did receive the Prop 1 Proponents Concepts for Public Benefits Contract (Principles Document) June 14, 2022, and I believe, have committed to presenting a draft contract and adaptive management plan general template to the round table by the end of this month/ early next month which should present some draft language pursuant some of the sections you identify.

Regarding the Draft Contract Review Process, your general statement seems accurate. I would add that we now know administering agencies will present our draft public benefits contracts to the Commission at the same time (i.e., for CWC Contract Review). Therefore, this period will also include coordination between public benefit administering agencies to ensure draft contract language is consistent, where appropriate. Additionally, components previously identified under 'contract execution' will now move to this phase. Specifically, administering agencies will likely need confirmation of any permits, agreements, contracts, etc. necessary for administration of a public benefit at this time so that we can complete and present our quantification and finding of net benefit for the CWC Contract Review.

Regarding CWC Contract Review- I encourage you to reach out to Amy Young as I know CWC staff have updated their process. I would just specify here that the public is providing comments to the Commission.

Final Contract Review- during this period, any comments received from the Commission (or via the public to the Commission) may be incorporated into the contract, as relevant, and the final public benefits contract would be reviewed and approved by both the project board and CDFW executive, as you've stated. [Contract Execution] It is at this point the agencies would confirm that the final public benefits being contracted for meet all requirements specified in Water Code section 79750 et seq., and subsequently, the public benefits contract could be executed. As you note- this process may have a longer timeline due to your internal board meetings but may also be affected by the amount and extent of edits required prior to execution. Note: If there are considerable changes between the draft contract presented to the CWC for review and the final draft I do not know what that means with regards to the Commissions' process (i.e., would they want to have a follow-up presentation/ review period or not?). I think the goal is to have a pretty 'final' version of the contract ahead of the CWC Review period above.

Therefore, the Contract Execution phase is no longer quite as you have described. The next phase would be the 'WSIP Final Award' or 'WSIP Execution' phase. Again, I suggest checking in with Amy Young on the processes/ requirements here. However, it is my understanding that it would be at this point Sites would need to have/demonstrate final environmental documentation and all federal, state, and local approvals, certifications, and agreements (additional but inclusive of those necessary for agency benefit contract execution, described above) pursuant the regulations, as well as their executed public benefits contracts.

Hope this helps,  
Paige

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**From:** Heydinger, Erin <[Erin.Heydinger@hdrinc.com](mailto:Erin.Heydinger@hdrinc.com)>

**Sent:** Thursday, July 7, 2022 3:51 PM

**To:** Uttley, Paige@Wildlife <[Paige.Uttley@wildlife.ca.gov](mailto:Paige.Uttley@wildlife.ca.gov)>; Boyt, Jessica@DWR <[Jessica.Boyt@water.ca.gov](mailto:Jessica.Boyt@water.ca.gov)>

**Cc:** Alicia Forsythe <[aforsythe@sitesproject.org](mailto:aforsythe@sitesproject.org)>; Patel, Trishna <[Trishna.Patel@hdrinc.com](mailto:Trishna.Patel@hdrinc.com)>

**Subject:** Sites Reservoir - Prop 1 Benefit Agreement Process/Contents

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Hi Paige and Jessica,

The Sites team is going to be bringing an update to the July meeting of the Authority Board on the Prop 1 benefit agreement process and contract contents. We are hoping you can take a quick look at the draft staff report (attached) and let us know if you have any comments/edits or if anything does not align with your thinking on the agreements. The contents are based on the Public Benefit Contract Workflow document Paige sent over as well as a recent meeting with Jessica on the DWR agreement.

We were also hoping you could review the paragraphs below to make sure we're on the right track for the overall process and timeline. There's a bit more detail on the process than is included in the staff report.

If at all possible, we'd appreciate any comments from you by the end of the day Tuesday, the 12<sup>th</sup>.

Thank you!

Erin

#### **Development of Draft Contract (approximately 3 months)**

All projects funded under the WSIP must enter into contracts with each appropriate State agency. The contracts created will supersede any commitments made in the WSIP application involving preliminary operations, monitoring, and management of the reservoir. The contents of the contracts are expected to be those identified in the "CAPB Workflow" document. The following sections will primarily use standard language from DWR/CDFW:

- Recitals
- Definitions
- Authority
- Term
- Right of entry
- Failure to comply with contract agreement
- Effect of contract agreement
- Breach of contract
- General terms and conditions
- Force majeure
- Process for amending and modifying contract

#### **Draft Contract Review Process (approximately 2 months)**

This process involves the review of the drafted benefit agreements by DWR/CDFW, Project board, and legal team. Once circulated, the drafts are to be edited by Sites Authority until approval is received by all reviewing parties. The time for completion of this process is dependent on the amount and extent of the edits required.

#### **CWC Contract Review (approximately 2 months)**

The public will be provided the opportunity to review the contract and provide comments. Additionally, the CWC is to review the contract and respond with comments.

#### **Final Contract Review (approximately 2 months)**

The final contract must be reviewed and approved by both the project board and a DWR/CDFW executive. This process may have a longer timeline due to internal board meetings.

#### **Contract Execution (approximately 2 months)**

During this process, the administering agencies will confirm that the public benefits currently meet all requirements that are specified in Water Code section 79750 et seq. This is especially necessary in the event that the amount of public

benefits changes between the time that the agencies' findings are reviewed and the Sites Authority enter into a contract with the agency. The required final environmental documentation and all federal, state, and local approvals, certifications, and agreements are to be confirmed, as well. Evidence is to be provided that the project has obtained the final draft public benefit contracts with each agency that is responsible for administering the public benefit.

Erin Heydinger, PE, PMP  
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# Preliminary Evaluation of the Planning Aid Memorandum Technical Memorandum



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**To:** Alicia Forsythe, Sites Project Authority  
**CC:** John Spranza, Sites Integration  
Laurie Warner-Herson, Sites Integration  
**Date:** July 14, 2022  
**From:** ICF  
**Quality Review:** Mike Hendrick (ICF)  
**Authority Agent Review:** N/A  
**Subject:** Preliminary Evaluation of the Planning Aid Memorandum

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## 1.0 Purpose

This memorandum presents a preliminary evaluation of the August 5, 2021, Planning Aid Memorandum (PAM) provided by the U.S. Fish and Wildlife Service (USFWS) to the Bureau of Reclamation (Reclamation) for the Sites Reservoir Project (Project). The purpose of the PAM was to provide Reclamation with the USFWS's comments and recommendations regarding the Project's potential effects on biological resources for consideration in project planning and preparation of a public revised draft environmental document. The PAM was prepared under the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 *et seq.*). The Fish and Wildlife Coordination Act requires federal agencies proposing water resource development projects or involved in issuance of related permits or licenses to consult with the USFWS and provide equal consideration to the conservation, rehabilitation, and enhancement of fish and wildlife resources with other project purposes.

The PAM summarized early coordination between USFWS and Reclamation regarding potential effects of the proposed Project. It provided a high-level description of the Project and USFWS's views of potential effects of the inundation of upland habitat (i.e., upland effects), increased diversions of Sacramento River water (i.e., in-river effects), and cumulative impacts associated with implementation of other projects. The PAM also summarized information and early analysis of effects provided to the USFWS by Reclamation and identified areas and concerns where the USFWS indicated that more information or analysis was needed.

The key concerns identified in the PAM are categorized as upland effects (Section 2.0), in-river effects (Section 3.0), and cumulative impacts (Section 4.0). Responses summarizing how each key concern was addressed are provided herein. The Revised Draft Environmental Impact Report/Supplemental Draft Environmental Impact Statement (RDEIR/SDEIS) released in November 2021 contained much of the information to address these key concerns (Sites Project Authority and Bureau of Reclamation 2021). The PAM was developed based on the USFWS's review of the first administrative draft of the RDEIR/SDEIS and there were several substantive changes that occurred between the administrative draft and the publicly released RDEIR/SDEIS, which are explained below. In addition, subsequent analysis

that has been developed to date in preparation of responses to public comments on the RDEIR/SDEIS and for the development of related permitting processes was also used to address the key concerns.

It is important to note that the analysis of the comments on the RDEIR/SDEIS, the response to those comments, and the preparation of the Final EIR/EIS are ongoing. The Authority has recently changed the Project's diversion criteria and has worked with Reclamation since the issuance of the RDEIR/SDEIS to enhance the Project's anadromous species benefits, especially as reflected in the modeling framework. In addition, the Authority has moved from Alternative 1 as its Preferred Project for the purposes of the California Environmental Quality Act compliance to Alternative 3. Revised modeling is underway to reflect these adjustments and once modeling is completed, the Authority and Reclamation look forward to discussing the results and revisions to subsequent species analysis with the USFWS, National Marine Fisheries Service [NMFS], and the California Department of Fish and Wildlife [CDFW]. Therefore, the information and responses in this memorandum may change as these enhanced species protections and species benefits are incorporated into the Project.

## 2.0 Upland Effects

**Key Concern:** Provide greater specificity regarding potential mitigation lands or banks for each of the habitat types for which mitigation is proposed.

**Response:** Given the size of the Project, the Sites Project Authority (Authority) will rely on several mitigation strategies including a mix of mitigation banks and other mitigation mechanisms. The Project's Mitigation and Monitoring Plan (Plan) is under development and will be provided to the USFWS as part of the Project's Biological Assessment (anticipated summer 2022) and Final EIR/EIS (anticipated early 2023). The Plan includes a comprehensive mitigation planning strategy, implementation approach and general criteria for species and habitats based on anticipated Project impacts on regulated biological resources. As access is currently limited to less than 1% of the Project Area, a final analysis of impacts will be conducted once land access is obtained and following the final refinements of Project design and completion of on-the-ground, protocol-level biological field surveys.

Following completion of Project construction, temporary impacts will be mitigated through restoration and revegetation of areas disturbed by construction in accordance with an approved habitat restoration plan. Permanent impacts will be mitigated on site and at agency-approved (USFWS, NMFS, and/or CDFW) offsite locations. Onsite compensatory mitigation may include restoration (re-establishment or rehabilitation), establishment (creation), enhancement, and/or preservation of aquatic or terrestrial biological resources that occur within the proposed Project area. Offsite compensatory mitigation for the proposed Project may include the purchase of agency-approved mitigation/conservation bank credits, the establishment of third party-responsible "turn-key" mitigation/conservation bank projects, preservation of biological resources through conservation easements with private landowners, payments to in-lieu fee programs, or the establishment of permittee-responsible offsite mitigation sites. The methods for assessing resources in the project footprint, best management practices to be applied, tools available for mitigating effects of the Project are discussed in chapters 9 – *Vegetation and Wetland Resources*, and 10 – *Wildlife Resources* of the RDEIR/SDEIS.

The Authority has conferred with USFWS about species habitat models and used this information to estimate mitigation obligations. The Authority expects to continue to work with USFWS and Reclamation as the Project moves forward and better information becomes available to define mitigation requirements.

**Key Concern:** Provide a better description of how increases in Incremental Level 4 refuge water will be provided and the expected benefit to migratory birds.

**Response:** Providing Incremental Level 4 refuge water is an environmental benefit of the Project recognized by the California Water Commission in its authorization of State funding from the Water Storage Investment Program (WSIP). The Authority envisions that CDFW will take an active role in managing the ecosystem water and the Authority would work with CDFW to schedule and adjust releases of ecosystem water to address real-time conditions and needs. The Authority also recognizes that Incremental Level 4 refuge water would be made available to federal refuges north and south of the Sacramento–San Joaquin Delta (Delta) and as such, expects that it would provide Incremental Level 4 water to appropriate destinations based on guidance from, and coordination with the CDFW, USFWS, and Reclamation. The Authority understands that Reclamation and CDFW have an existing methodology to allocate Incremental Level 4 refuge water to the National Wildlife Refuges, State Wildlife Areas, and privately managed wetlands included in Central Valley Project Improvement Act Refuge Water Supply Program. The Authority anticipates that CDFW and Reclamation would allocate the Incremental Level 4 refuge water that results from the Project in the same way they allocate all Incremental Level 4 refuge water.

Table 1 below is from the Authority’s *Water Storage Investment Program: Sites Reservoir Project Continuing Eligibility and Feasibility Determination* report (Authority 2021). It identifies the Project’s Incremental Level 4 refuge water supply benefits in terms of water supply increases to National Wildlife Refuges, State Wildlife Areas, and privately managed wetlands projected in 2030 and 2070 as estimated based on WSIP Unit Water Values. Incremental Level 4 represents the additional increment of water required for optimal wetland habitat development on the National Wildlife Refuges, State Wildlife Areas, and privately managed wetlands included in Central Valley Project Improvement Act Refuge Water Supply Program. The benefits to migratory birds of Incremental Level 4 refuge water supply were identified as part of the original foundational documents of the Central Valley Project Improvement Act and differ for each individual National Wildlife Refuge, State Wildlife Area, and privately managed wetland.

**Table 1. Sites Reservoir Project Incremental Level 4 Refuge Water Supply Increases (2030 and 2070) (TAF/year)**

Period	North-of-the-Delta	South-of-the-Delta <sup>(b)</sup>	Total
<b>2030 Results</b>			
Long-Term Average <sup>(a)</sup>	5	11	17
Wet	0	0	0
Above Normal	9	5	14
Below Normal	9	13	22
Dry	8	27	34
Critical	6	17	23
<b>2070 Results</b>			
Long-Term Average <sup>(a)</sup>	5	10	15
Wet	0	0	0
Above Normal	9	1	10
Below Normal	7	8	16
Dry	7	10	17
Critical	6	21	27

Source: CALSIM II.

Notes:

(a) Average weighted based on water-year frequency rates

(b) Includes both San Joaquin and Tulare Lake Refuge deliveries and based on San Joaquin Valley 60-20-20 Index Year Class.

TAF = thousand acre-feet

**Key Concern:** More thorough analysis is needed of geomorphic effects of flow reduction in the higher flow range on habitat (cut bank formation, cottonwood seed dispersion/regeneration processes, wood transport) and the sensitive species that use it (e.g., bank swallows, yellow-billed cuckoo).

**Response:** The SRH-Meander model results presented in the RDEIR/SDEIS (Chapter 7 – *Fluvial Geomorphology*) suggested that the tendency for meander is not significant among the Project alternatives and the No Action Alternative (NAA). The river meandering, bank erosion, and deposition modeling concluded that there were no significant differences in the channel alignments between existing conditions and the modeled alternatives. Thus, operational impacts on the geomorphic regime (including natural river geomorphic processes such as sediment transport and bank erosion) and existing river geomorphic characteristics (e.g., sinuosity, channel gradient, substrate composition, channel width and depth, and riparian vegetation) of the greater Sacramento River system are expected to be minimal, and consequently, impacts on sensitive species would be negligible or minimal as well. The Authority will review these results with USFWS and Reclamation to determine whether additional analysis is warranted, or additional considerations will be added to the monitoring and adaptive management plans or the Project description.

**Key Concern:** Additional review may be needed of the resource protection measures identified for habitats (e.g., riparian, upland, stream, and wetland) that could support special-status species including the listed valley elderberry longhorn beetle, red-legged frog, and several rare plants, which are potentially present within the impact area.

**Response:** As stated above, verification of species' presence and habitat suitability has been limited by lack of access to lands that would be affected by the Project. Potential wildlife resources in the study area were evaluated by reviewing existing information and identifying potentially suitable habitat with geographic information system modeling. Sources of information and modeling techniques are summarized in Chapter 10, *Wildlife Resources*, of the RDEIR/SDEIS. The Authority will continue to work with Reclamation, USFWS, NMFS, CDFW, and other regulatory agencies to review these results and discuss the resource protection measures, including avoidance and minimization measures. These efforts have been ongoing for some time for aquatic species with more limited discussion on terrestrial species. The Authority with Reclamation would like to engage in more detailed discussion of these concerns with regard to terrestrial species.

### 3.0 In-River Effects

**Key Concern:** Provide a better demonstration of temperature benefit expected from opportunities to increase storage in Shasta Reservoir.

**Response:** In coordination with Reclamation, text was developed to expand the discussion of fisheries benefits related to increased operational flexibility associated with Shasta Reservoir. This text was developed after issuance of the PAM and was included in Chapter 2, *Project Description and Alternatives*, of the RDEIR/SDEIS. Additional water supply from Sites Reservoir would provide opportunities for improved management of salmonid habitat, particularly in the Sacramento River above Red Bluff Diversion Dam. By exchanging Sites Reservoir water for Central Valley Project (CVP) water, Reclamation has an additional tool to maintain and improve habitat for salmonid spawning,

incubation, rearing, and migration. By delivering water to CVP contractors from Sites Reservoir, Reclamation may maintain supply in Shasta Reservoir. Maintenance of supply can then be allocated in real-time management scenarios to uses that protect and enhance anadromous fish benefits, including protecting and enhancing the cold-water pool, which is essential for temperature control in the salmonid spawning reaches below Keswick Dam during Dry and Critically Dry Water Years. Increased storage may provide benefits beyond temperature such as providing a resource for maintaining fall flows to sustain spawning redds that persist in the wetted margins of the Sacramento River. In years when storm events are weak and naturally-occurring pulse flows are minimal, this maintenance of supply could be used to manufacture a spring pulse flow to assist juvenile salmonids in completing their migration from the upper Sacramento River to the Delta and ultimately the Pacific Ocean. The Authority is working with Reclamation to assess and enhance fisheries benefits associated with Reclamation's participation for the multiple objectives related to increased Shasta Reservoir storage.

The Project would also provide an additional capability to address expected changes in precipitation and runoff patterns anticipated to result from climate change (see Chapter 28 of the RDEIR/SDEIS). While long-term averages in precipitation are not expected to change, more precipitation is expected to fall as rain, resulting in a decreased snowpack and changes in runoff patterns. These changes will likely present challenges for future water management, including that for environmental benefits. The ability of the Project to capture and store water that cannot be captured and stored by Reclamation and to exchange water with Shasta Reservoir creates flexibility to provide environmental benefits to anadromous fish in the upper Sacramento River under climate change scenarios.

**Key Concern:** In general, whenever water diversions occur, there will be an associated loss of food organisms and sediment, incidental mortality of fish at the intake screen(s), and lower survival due to lower flows and related mechanisms (predation exposure, less inundated edge cover, less food production, less suspended sediment). Specific concerns expressed are as follows:

- A. Flow criteria at Wilkins Slough (8,000 cfs [cubic feet per second] in April and May; 5,000 cfs in other months) is likely inadequate to protect downstream migrating salmon. Suggest consideration of Michel et al. (2021).
- B. Need more thorough analysis of effects of habitat reduction on survival. Weighted usable area (WUA) curves do not disclose all effects associated with reduced flow.
- C. Need more complete analysis of effects of flow reductions on sturgeon migration.

**Response:**

- A. Wilkins Slough: In response to the concerns expressed in the PAM and the comments on the RDEIR/SDEIS from CDFW and others, the Authority increased the minimum bypass flow requirement at Wilkins Slough during October to June to 10,700 cfs (303 m<sup>3</sup>/s), which is consistent with the step function identified to in Michel et al. (2021) for increased Chinook salmon survival in the Sacramento River. In summary, Michel et al. (2021) looked at the challenge of implementing functional flows to optimize ecosystem improvements given the limited resources. The minimum bypass flow at Wilkins Slough during September remains at 5,000 cfs. The Project will not be diverting water from June 15 to the end of August. Revisions have been made to the Project diversion criteria. These revisions are reflected in Table 2.

**Table 2. Comparison of RDEIR/SDEIS and Revised Diversion Criteria**

Location (Listed from North to South)	RDEIR/SDEIS with Mitigation Included	Revised and Expected in the Final EIR/EIS
Bend Bridge Pulse Protection	Protection of all qualified precipitation-generated pulse events (i.e., peaks in river flow rather than scheduled operational events) from October to May based on the detection of fish presence and migration during the beginning of the flow event. For each event where fish presence and migration is detected, diversions from the Sacramento River would cease for 7 days.	Similar except the following: (1) a qualified precipitation-generated pulse event is determined based on forecasted flows and (2) pulse protection may cease earlier than 7 days if flows at Bend Bridge exceed 29,000 cfs and Project diversions subtracted from Bend Bridge flows continue to be at least 25,000 cfs
Minimum Bypass Flows in the Sacramento River at the RBPP	3,250 cfs minimum bypass flow at all times; rate of diversion controlled by fish screen design	No change
Minimum Bypass Flows in the Sacramento River at the Hamilton City Pump Station	4,000 cfs minimum bypass flow at all times; rate of diversion controlled by fish screen design	No change
Minimum Bypass Flows in the Sacramento River at Wilkins Slough	10,700 cfs in March through May; 5,000 cfs all other times	10,700 cfs October through June; 5,000 cfs September (not diverting from June 15 to end of August)
Fremont Weir Notch Protections	No more than 1% reduction in flow over weir when spill over the weir are less than 600 cfs. No more than a 10% reduction in flow over weir when spills over the weir are between 600 cfs and 6,000 cfs. No restriction when flows over the weir are greater than 6,000 cfs	No longer included. Revised minimum bypass flows in the Sacramento River at Wilkins Slough and Bend Bridge Pulse Protection provide protections for Fremont Weir Notch
Freeport, Net Delta Outflow Index, X2, and Delta Water Quality	Operations consistent with all applicable laws, regulations, biological opinions and incidental take permits, and court orders in place at the time that diversion occurs	No change

Note: This table mimics Table 2-5 in the RDEIR/SDEIS and the Wilkins Slough flow requirements have been incorporated into the Project Description.

The Authority is working with Reclamation to revise the modeling and determination of effects of the Project’s revised operations criteria on fisheries resources. The Authority is also in ongoing conversations with Reclamation, CDFW, NMFS, and USFWS to develop language to describe how these operational requirements will be implemented and develop the associated fish monitoring program.

- A. Upstream habitat: The Authority agrees diverting flow can have effects on habitat volume and available food that are likely more limiting, and not apparent in WUA calculations. The WUA is derived from the CALSIM runs and as such the WUA’s are based on monthly averages that may not accurately reflect real time operations. The analysis in Chapter 11, *Aquatic Biological Resources*, of the RDEIR/SDEIS considers factors such as temperature, flow, and the effects of flow reductions on side channel and floodplain habitats to support its impact determination of less than significant with mitigation for salmonids.

The Authority will revise the CALSIM analysis with the revised diversion criteria and enhanced anadromous fish benefits to reassess the effects on WUA in the Final EIR/EIS. During 2022, the Authority will work with Reclamation, USFWS, NMFS, and CDFW to review the revised modeling and related analyses to assess the adequacy of the analysis and work toward consensus on impact determinations and any measures needed to reduce impacts to less than significant levels (CEQA) and no adverse effects (NEPA).

- B. Sturgeon: Shaffter (1997) reported spawning on white sturgeon in the Sacramento River at flows of about 6,500 to 6,640 cfs (184 to 188 m<sup>3</sup>/s) after observing pulse of about 1,400 cfs (40 m<sup>3</sup>/s) over base flow conditions. This reference appears to be the source for the concern. The Authority's decision to adopt a higher minimum bypass flow at Wilkins Slough and the Project's pulse flow protection measure would ensure the Project diversion do not cause flows to decline below those likely to influence sturgeon migration and spawning.

**Key Concern:** The relationship between pulses and fish movement is not a precise relationship. Longer and more frequent flows may be necessary to protect downstream-migrating juvenile salmon.

**Response:** The Project's pulse protection measure is intended to account for the importance of pulses in stimulating and providing for the redistribution of juvenile fish from their spawning grounds to downstream rearing areas and seaward migration (Poytress 2014, Steel 2020, Michel 2021, Hassrick 2022). The Authority recognizes that the precise relationship between flow pulses and fish movement is not known at this time. As such, the Authority intends to incorporate the pulse protection criteria, and strategies for evaluating the effectiveness of the criteria, into its adaptive management plan to address this uncertainty and continue to refine the criteria as the science and understanding of fish movement is better understood.

**Key Concern:** Need to address pulses as a mechanism to initiate/attract adult salmon and sturgeon up stream.

**Response:** As presented in the RDEIR/SDEIS, the Project is not expected to impede the upstream migration of adult salmon or sturgeon. The proposed pulse flow criteria ensure pulses are protected and propagate downstream. In addition, the revised minimum bypass flow requirement at Wilkins Slough ensures that Project operations do not diminish flows below levels which may interrupt or delay the upstream migration of sturgeon.

**Key Concern:** Provide a better explanation of effects and benefits of fall pulse flows into Yolo Bypass for plankton production and discussion of consequences of reduced flow into the bypass due to reduction in flows attributable to diversions at TCCA and GCID diversions.

**Response:** An analysis of the expected timing and benefit of the Yolo Bypass flow measure to stimulate food production and convey forage species to the north Delta for the benefit of delta smelt (*Hypomesus transpacificus*) and other planktivorous fish is presented in Chapter 11 - *Aquatic Biological Resources*, of the RDEIR/SDEIS. The benefit of this measure has been acknowledged by CDFW in the review of the Project during the California Water Commission's WSIP approval process. An analysis of the consequences of reduced flow into the Yolo Bypass due to reduction in flows attributable to diversions at TCCA and GCID diversions is provided in the section, *Impact FISH-2: Operations Effects on Winter-Run Chinook Salmon, Floodplain Inundation and Access*, in Chapter 11 - *Aquatic Biological Resources*, of the RDEIR/SDEIS, as well as in Appendix 11M. The analysis concludes that Sites diversions result in minor reductions in Yolo Bypass acreages inundated during the winter and spring, but that when the net effect

of all differences between the NAA and Alternatives 1, 2, and 3 are examined, the differences are small and the effect on fish populations is expected to be minor.

**Key Concern:** Address expected increase in loss of fish at South Delta export facilities associated with July through September increases in Delta exports.

**Response:** The effect of moving Sites Reservoir water across the Delta to the Delta export facilities on the location of X2, flows in Old and Middle River, and expected loss at the export facilities are addressed in Chapter 11 - *Aquatic Biological Resources*, and Appendix 5B3, *Delta Operations*, of the RDEIR/SDEIS. The results of these analyses suggest there would be little difference in south Delta loss between the NAA and Alternatives 1, 2, and 3, primarily due to absence of juvenile ESA-listed fish in the Delta between July and September.

**Key Concern:** More thorough analysis may be needed of the effects of exchanges on spawning and rearing habitat in the American and Feather Rivers.

**Response:** The effects of Project operations on temperatures in the American and Feather Rivers are discussed in Chapter 11, *Aquatic Biological Resources*; Appendix 11B, *Upstream Fisheries Impact Assessment Quantitative Methods*; and Appendix 11D, *Fisheries Water Temperature Assessment*, of the RDEIR/SDEIS. The results indicate impacts from changes in temperatures are less than significant. The effects of Project operations on availability of spawning and rearing habitat in the American and Feather Rivers are also analyzed in Chapter 11 and Appendix 11K, *Weighted Usable Area Analysis*, of the RDEIR/SDEIS. The analysis suggests no significant differences between Alternatives 1, 2, and 3 and the NAA with respect to WUA. An analysis of the potential redd dewatering in the American and Feather Rivers was also conducted and discussed in Chapter 11. The results of that analysis suggested no significant differences among the alternatives and the NAA.

These analyses will be revised to reflect the revised diversion criteria and enhanced anadromous fish benefits in revised CALSIM and other model runs. Once the updated modeling is completed, the Authority will be available to present and discuss those results with Reclamation, USFWS, NMFS, CDFW and the other regulatory agencies.

## 4.0 Cumulative Impacts with Other Projects

**Key Concern:** Reclamation should consider the benefits of these other projects, how they would interact with the Project, and explain the sequence of construction/completion relative to the Project.

**Response:** The Authority understands the interest in exploring how the Project may operate in conjunction with other projects such as the revised Delta Conveyance Project and the Shasta Raise Project. However, these projects are presently not sufficiently developed to assess how they would be constructed and operated, and any analysis of cumulative effects would be speculative. The Authority thinks adding speculative results to the cumulative effects analysis could be misleading; therefore, it does not plan to pursue such an analysis. For additional details, refer to Chapter 31, *Cumulative Impacts*, in the RDEIR/SDEIS. Chapter 31 states "The cumulative analysis is primarily qualitative. The cumulative analysis qualitatively addresses projects listed in Table 31-1, such as Delta Conveyance Project. For many of the projects in Table 31-1 it would be speculative to define multiple parameters and assumptions within a numerical modeling effort."

## 5.0 References

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- Steel, A.E., Anderson, J.J., Mulvey, B., & Smith, D.L. (2020). Applying the mean free-path length model to juvenile Chinook salmon migrating in the Sacramento River, California. *Environmental Biology of Fishes*, 103, 1603-1617. <https://doi.org/10.1007/s10641-020-01046-8>

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**From:** Robert Cheng [RCheng@cvwd.org]  
**Sent:** 7/14/2022 1:51:42 PM  
**To:** Marcia Kivett [MKivett@sitesproject.org]; Thad Bettner [tbettner@gcid.net]; Laurie Warner Herson [laurie.warner.herson@phenixenv.com]; Alicia Forsythe [aforsythe@sitesproject.org]; Petya Vasileva [PVasileva@cvwd.org]; Cindy Kao [CKao@valleywater.org]; Rob Kunde [rkunde@wrnwmsd.com]; William Vanderwaal [wvanderwaal@rd108.org]; Katrina Jessop [KJessop@valleywater.org]; Bradshaw, Dee [VBradshaw@mw dh2o.com]; Neudeck, Randall D [rneudeck@mw dh2o.com]; Jerry Brown [jbrown@sitesproject.org]; Linda Standlee [LStandlee@swc.org]; Briard, Monique [Monique.Briard@icf.com]; Spranza, John [john.spranza@hdrinc.com]; Kayla Mendonca [kmendonca@gcid.net]; Sandy Kasumovic [SKasumovic@cvwd.org]; Katherine Maher [KMaher@valleywater.org]; Sandra Yarbrough [Syarbrough@BrwnCald.com]; 8:orgid:dfaba08b-c04b-4ca7-a38a-767670966aa7; 8:orgid:b6ecc83f-bd44-4d0f-b957-abc7032717c4; 8:orgid:088c9bfe-10b0-4584-a055-87ab65bb454b; 8:teamsvisitor:62d8f789273642f2be0b32df44e32b2e; 8:orgid:eea97415-f842-49e6-b6a9-cdfedbf15568; 8:teamsvisitor:fff60532204a450a8d08dbc7e35efd41; Sheehan, Rebecca D [RSheehan@mw dh2o.com]; 8:teamsvisitor:262626e7a31b4f9287787dd078dc4866; 8:orgid:d015113a-3b6c-4847-afed-761a71dd9472

Maybe a little off-topic, but we had a short discussion regarding potential water quality impacts with the reduced volume of the dead pool in the operations workgroup meeting a few days ago. I was wondering if the impacts better fit within the discussions within this workgroup or somewhere else? Also, would these impacts have to be discussed during our permitting process?



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Phone: (916) 714-1801 • Fax: (916) 714-1804

## Robertson-Bryan, Inc. Qualifications for CEQA and NEPA Mercury Assessments

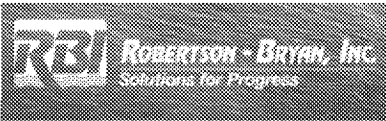
Robertson-Bryan, Inc. (RBI) is a multi-disciplinary consulting firm of scientists and engineers with expertise in water and power resource planning, wastewater regulations and engineering, water quality, aquatic and terrestrial biological resources, and regulatory compliance. The firm draws on decades of consulting and research experience to simultaneously address technical, economic, and regulatory compliance issues, and to provide timely and effective solutions for resolving resource concerns.

RBI provides a variety of environmental consulting services, including preparation of environmental assessments for California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA) compliance. RBI's managing partner, Dr. Michael Bryan, and the RBI staff have decades of collective experience and expertise investigating complex environmental ecosystems in central and northern California. RBI's combination of high-level technical knowledge and CEQA/NEPA experience in the fields of terrestrial and aquatic biological resources, hydrology, and water quality and ecotoxicology make them highly sought after for inclusion on consulting teams preparing CEQA and NEPA documents for complex projects to prepare water quality and aquatic biological resource assessments.

RBI has prepared environmental analyses involving mercury assessments and bioaccumulation modeling for several significant water supply projects in the Central Valley, and has prepared environmental impact statement and environmental impact report chapters to support these projects. These projects include modeling and assessing effects of reoperation of the Central Valley Project and State Water Project, Bay-Delta Conveyance Project/WaterFix alternatives, and Delta Conveyance Project alternatives on Sacramento-San Joaquin Delta (Delta) mercury concentrations and bioaccumulation in fish. Projects by RBI staff associated with mercury contamination also include environmental assessments at metal mines throughout North America, at the Carson River Superfund Site, and at the Sulfur Bank Mercury Mine Superfund Site. Most recently, RBI developed the mercury and methylmercury appendix for the Sites Reservoir Project Revised Draft Environmental Impact Report/Supplemental Draft Environmental Impact Statement released for public review in 2021. This document analyzed and described potential effects of project alternatives on the aquatic environment associated with mercury and methylmercury as required for CEQA and NEPA compliance.

Key RBI staff involved in these assessments are Dr. Michael Bryan, Dr. Ben Giudice, and Cameron Irvine.

- **Michael Bryan, Ph.D.** Michael has over 30 years of experience completing CEQA and NEPA water quality and aquatic biological resources assessments for Central Valley water supply projects. He has extensive familiarity with how water project operations affect Delta inflows and water quality.
- **Cameron Irvine, M.S.** Cameron has over 23 years of experience assessing the effects of metals in aquatic environments for ecological risk assessments, site assessments, toxicity investigations, and CEQA and NEPA compliance.
- **Ben Giudice, Ph.D.** Ben has over 15 years of experience completing technical analyses of Central Valley water quality impacts, including impacts to mercury and methylmercury in surface waters.



**Years of Experience:**

16

**Education:**

Ph.D., Environmental and Water Resources Engineering, Minor in Ecotoxicology, 2012, University of California, Davis

M.S., Environmental Engineering, 2007, University of California, Davis

B.S.E., Civil Concentration, 2005, Calvin College, Grand Rapids, MI.

**Professional Affiliations:**

Professional Engineer (Civil), California No. 81595

**Expertise:**

- Wastewater Studies
- Water Quality Modeling
- Recycled Water Master Plans and Market Assessments
- Wastewater and Recycled Water Preliminary/Conceptual Design and Analysis
- Hydraulic Modeling for Water and Recycled Water Systems
- Environmental Fate and Transport
- Ecotoxicology

**Ben D. Giudice, Ph.D.**  
**Senior Environmental Engineer**

Dr. Ben D. Giudice is an environmental engineer with 16 years of experience studying and practicing environmental and water resources engineering. His expertise includes water and wastewater engineering, hydraulics, environmental fate and transport, risk assessment, ecotoxicology, constituents of emerging concern, analytical chemistry, and field and laboratory data collection, compilation, and analysis. His academic work includes site, watershed, and regional scale risk assessments of roadside applied herbicides in highway runoff; studies of endocrine disruptors, pharmaceuticals, and personal care products in runoff from land applied municipal biosolids; and studies on the effects of endocrine disruptors on reproduction in aquatic invertebrates. Ben joined RBI in 2009 and performs technical evaluations for wastewater and stormwater permitting and compliance, engineering evaluations for wastewater and recycled water projects, and technical evaluations and management for environmental impact assessments.

**REPRESENTATIVE PROJECT EXPERIENCE**

**California WaterFix/Bay Delta Conservation Plan EIR/EIS**

Served as project manager and technical lead, and led development of the water quality methodology, including assessment of over 190 constituents, detailed assessment of 15 constituent categories, and integrated use of three models used to assess water quality impacts resulting from the implementation of the proposed project and its alternatives. Developed post-processing tools necessary to assess impacts in the Delta. Led or assisted with all constituent-specific assessments. Worked with multiple local, State, and Federal agencies to resolve issues and participated in stakeholder and public outreach efforts.

**Tule Red Tidal Restoration Project**

Assisted the project proponents with water quality related aspects of the project. Designed and helped implement a water quality monitoring program and analyzed resulting data. Prepared presentations and memorandum advising on dissolved oxygen and methylmercury issues related to the project.

**California Department of Fish and Game Suction Dredging EIR**

Conducted a literature review concerning the water quality and toxicological impacts of recreational suction dredging. The review included published and unpublished scientific studies, reviews, and public comments, and focused on suction dredging impacts on turbidity and mercury release, fate, transport, and effects. Results informed the development of a methodology for assessing impacts of mercury discharged from suction dredging.

**Sites Reservoir Recirculated Draft EIR and Supplemental Draft EIS**

Co-authored the water quality chapter technical appendix for mercury and methylmercury. This included development of a conceptual model for mercury and methylmercury fate and transport within the Sacramento River, Yolo Bypass, and Sacramento-San Joaquin Delta, and discussion of quantitative model results for the impact analysis. Data output from CALSIM II was integrated with a quantitative fish tissue mercury model (developed for the Central Valley Regional Water Quality Control Board mercury total maximum daily load) to determine the potential magnitude of changes in Delta fish tissue mercury concentrations associated with the proposed project and its alternatives.

**From:** Laurie Warner Herson [laurie.warner.herson@phenixenv.com]  
**Sent:** 7/18/2022 10:53:26 AM  
**To:** Alicia Forsythe [aforsythe@sitesproject.org]  
**Subject:** FW: Reclamation coordination  
**Attachments:** - Sites\_ICF\_InternalSchedule\_07122022.pdf

Hi Ali,

The updated schedule (see attached and email below) was sent over by ICF on Friday, I will review it this morning.

ICF and I have a quick meeting with Reclamation at 12:30 to discuss the schedule for reviewing RTC batches and will follow up with you on the biweekly call this afternoon, as needed.

Happy Monday !

Laurie

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**From:** Harris, Melissa <Melissa.Harris@icf.com>  
**Sent:** Friday, July 15, 2022 5:02 PM  
**To:** Laurie Warner Herson <laurie.warner.herson@phenixenv.com>; Briard, Monique <Monique.Briard@icf.com>; Williams, Nicole <Nicole.Williams@icf.com>  
**Subject:** RE: Reclamation coordination

Hello Laurie,

Please see the following table of our proposed schedule for the review of comments responses. This batching is organized by action code and includes both the tables of the draft comment responses and the draft master responses.

	<i>Date of Delivery</i>	<i>Approximate Number of Comments</i>	<i>Subject Matters</i>	<i>Action Codes</i>	<i>Primary Master Responses*</i>
<b>Batch 1</b>	7/22/2022	595	Response to General Comments, Cultural, Groundwater Resources, Geology and Soils, Minerals, Land Use, Population and Housing, Agriculture, Recreation, Energy, Public Health and Environmental Hazards, Economic Justice, Growth-Inducing Effects, Socioeconomics, Vegetation, Wetland, and Wildlife Resources, Tribal Coordination, Consultation, and Engagement, Alternatives Development	10000, 10100, 11000, 11200, 11300, 11400, 11500, 12000, 13000, 14000, 15000, 15100, 15200, 20000, 21000, 21100, 21200, 21300, 21400, 21500, 21600, 22000, 33000, 52700, 51300, 51700, 51900, 53000, 52000, 52100, 52200, 53200, 53500, 61000, 70000, 50000, 51400, 51500, 52800, 30000, 31100, 31200, 32000, 32100, 32200	MR1: Response to General Comments MR6: Vegetation, Wetland and Wildlife Resource MR7: Tribal Coordination, Consultation and Engagement MR9: Alternatives Development

<b>Batch 2</b>	8/17/2022	29	Alternatives Description and Baseline, Air Quality & Health Risk Assessment, GHG, Transportation, Traffic, Navigation, Public Services and Utilities, Trinity River	31000, 31100, 31200, 32100, 32200, 32300, 51800, 52500, 52600, 52300, 53100, 50100	MR2: Alternatives Description and Baseline MR8: Trinity River
<b>Batch 3</b>	9/22/2022	427	Hydrology and Hydrologic Modeling, Water Quality, Surface Water Resources, Fluvial Geomorphology, Aquatic Biological Resources, Climate Change, Climate Change Modeling, Cumulative Impacts, Projects Considered, Cumulative Impacts Analysis/Mitigation Measures	40000, 41000, 43000, 44000, 47000, 48000, 50000, 50000, 51000, 51100, 51110, 51120, 51200, 51300, 50000, 51600, 51610, 51620, 51630, 51640, 51650, 51660, 51670, 51680, 51690, 53300, 53310, 60000, 60100, 60200	MR3: Hydrology and Hydrologic Modeling MR4: Water Quality and Surface Water Resources MR5: Aquatic Biological Resources

*\*The action codes responses may refer to more than one Master Response.*

Attached is the updated schedule for our discussion next week. The yellow highlighted tasks are need coordination with Jacobs. The pink highlighted tasks include questions for Reclamation. We are also hoping to get a copy of the previous EIR/EIS reviewers.

Please let me know if I can assist you in any way,  
Melissa



**Melissa Harris, PMP**  
916.210.5916 (direct)  
980 9th Street Suite 1200, Sacramento, CA, 95814, USA

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**From:** Laurie Warner Herson <laurie.warner.herson@phenixenv.com>  
**Sent:** Thursday, July 14, 2022 12:46 PM  
**To:** Briard, Monique <Monique.Briard@icf.com>; Williams, Nicole <Nicole.Williams@icf.com>; Harris, Melissa <Melissa.Harris@icf.com>  
**Subject:** RE: Reclamation coordination

Hi Monique,

Since we could not schedule today, I need you to provide some windows when you are available to walk through the batching schedule with Reclamation. I let Melissa know that the first batch is coming on the 25<sup>th</sup> but we need to confirm who reviews and turnaround time. Let me know if you have time tomorrow or early next week.

Also, we will need your updated schedule by the week of the 25<sup>th</sup> so we can fully brief Jerry. Talking through Melissa's comments will need to be done soon.

Thank you,

Laurie

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**From:** Briard, Monique <Monique.Briard@icf.com>  
**Sent:** Tuesday, July 12, 2022 3:58 PM

**To:** Laurie Warner Herson <laurie.warner.herson@phenixenv.com>; Williams, Nicole <Nicole.Williams@icf.com>; Harris, Melissa <Melissa.Harris@icf.com>

**Subject:** RE: Reclamation coordination

Including Melissa on my response. I was just crafting an email to send to you so I've included it below instead. I was waiting to obtain the spreadsheet with the MR and action code details to send you the email but will send the spreadsheet to you tomorrow instead. We are proposing sharing the schedule with Melissa in 2 phases – Batching now so that she knows it's coming and then a separate call to discuss the overall schedule once you've had a chance to review our questions.

Regarding Jacobs, it would be nice if you could lead that effort for us since their workload will need to be prioritized and new dates provided. We've identified the tasks that will need to be updated and will provide that to you.

Not sure about your last bullet since I wasn't on that email.

*Hi Laurie,*

*Here is our proposed schedule for the Batching of the EIR/S MRs and Action Code Tables. We are proposing to send Batch 1 on Monday, 7/25 and I know that Reclamation and PC have requested a schedule for deliverables so we are sending this now while we continue to work on the overall schedule. We've also attached the details for the MRs and tables that will be submitted so that you can see what will be included. This may change a bit but it is a good representation of what tables to anticipate. We've included BDO &/or Solicitors office review of each of the batches to generate the conversation with Vanessa/Melissa on who needs to be a part of this review step. Our goal is to move as much of the review and comments to the front of the process as possible.*

*Similarly, we have a few questions on the overall schedule that we will be sending to you tomorrow to refine the schedule for Reclamation.*

Task Name	Duration	Start	Finish	Predecessor
<b>Batch 1 - MR 1, 6, 7 &amp; 9 and associated Action Code Tables</b>	<b>83 days</b>	<b>Fri 4/29/22</b>	<b>Tue 8/23/22</b>	
ICF submit MRs & Action Code Tables to Integration and Reclamation (including BDO &/or Solicitors office)	61 days	Fri 4/29/22	Fri 7/22/22	20
Integration, Legal, Authority and Reclamation review Batch 1	10 days	Mon 7/25/22	Fri 8/5/22	23
Integration consolidates and resolves conflicting comments to send to ICF	2 days	Mon 8/8/22	Tue 8/9/22	24
ICF updates MR and Action Code Tables & CAT Team inputs responses into database & produces draft RTC tables for each letter	10 days	Wed 8/10/22	Tue 8/23/22	25
<b>Batch 2 - ICF submit MR 2 &amp; 8 and associated Action Code Tables</b>	<b>28 days</b>	<b>Wed 8/10/22</b>	<b>Fri 9/16/22</b>	
ICF reviews comments received on Batch 1 for global edits that need to be made to Batch 2	5 days	Wed 8/10/22	Tue 8/16/22	20,25
ICF submit MRs & Action Code Tables to Integration and Reclamation (including BDO &/or Solicitors office)	1 day	Wed 8/17/22	Wed 8/17/22	28
Integration, Legal, Authority and Reclamation review Batch 2	10 days	Thu 8/18/22	Wed 8/31/22	29
Integration consolidates and resolves conflicting comments to send to ICF	2 days	Thu 9/1/22	Fri 9/2/22	30
ICF updates MR and Action Code Tables & CAT Team inputs responses into database & produces draft RTC tables for each letter	10 days	Mon 9/5/22	Fri 9/16/22	31
<b>Batch 3 - ICF submit MR 3, 4 &amp; 5 and associated Action Code Tables</b>	<b>54 days</b>	<b>Wed 8/10/22</b>	<b>Mon 10/24/22</b>	
ICF reviews comments received on Batch 1 for global edits that need to be made to Batch 2	5 days	Wed 8/10/22	Tue 8/16/22	25
Jacobs completes MR3 and associated Action Code Tables	0 days	Fri 9/2/22	Fri 9/2/22	
ICF submit MRs & Action Code Tables to Integration and Reclamation (including BDO &/or Solicitors office)	15 days	Fri 9/2/22	Thu 9/22/22	20,34,35
Integration, Legal, Authority and Reclamation review Batch 3	10 days	Fri 9/23/22	Thu 10/6/22	36
Integration consolidates and resolves conflicting comments to send to ICF	2 days	Fri 10/7/22	Mon 10/10/22	37
ICF updates MR and Action Code Tables & CAT Team inputs responses into database & produces draft RTC tables for each letter	10 days	Tue 10/11/22	Mon 10/24/22	38



**Monique Briard**  
916.231.9551 (direct) | 916.842.0894 (mobile)

**From:** Laurie Warner Herson <laurie.warner.herson@phenixenv.com>  
**Sent:** Tuesday, July 12, 2022 3:41 PM  
**To:** Briard, Monique <Monique.Briard@icf.com>; Williams, Nicole <Nicole.Williams@icf.com>  
**Subject:** Reclamation coordination

Hi Monique and Nicole,

I am trying to catch up on action items from our meeting(s) last week:

- Do we need to get a call set up with Melissa to clarify/confirm the schedule? I'd like to send her a heads-up email about when they will be getting the first batch of RTCs for review (and others, if possible)
- Based on the Alt 2 call, it seems like Jacobs' priority at the moment is modeling but I think we should still set up a call to walk through the other expected deliverables – do you want to take the lead in scheduling that call ?

- Per my email this morning, do we have possible times for a meeting on the TMP issues this Friday or do we need to move to next week?

I think that's it but let me know if I missed anything.

Laurie

Laurie Warner Herson  
Principal/Owner



**Environmental Planning**

916.201.3935

[laurie.warner.herson@phenixenv.com](mailto:laurie.warner.herson@phenixenv.com)

State of California Small Business (#1796182)

Supplier Clearinghouse Women Business Enterprise (#16000323)

<http://phenixenv.com/>


Sites\_ICF\_InternalSchedule\_07122022

ID	Task Name	Duration	Start	Finish	Predecessors	Workday Countdown	% Complete
1	<b>Sites Reservoir Project Schedule for Task Order Amd 3</b>	<b>2156 days</b>	<b>Thu 7/1/21</b>	<b>Thu 10/4/29</b>			<b>14%</b>
2	<b>NEPA/CEQA Process</b>	<b>402 days</b>	<b>Fri 11/12/21</b>	<b>Mon 5/29/23</b>			<b>51%</b>
3	<b>Revised RDEIR/SDEIS Public Release</b>	<b>56 days</b>	<b>Fri 11/12/21</b>	<b>Fri 1/28/22</b>			<b>100%</b>
10	<b>Prepare Final EIS/EIR</b>	<b>386 days</b>	<b>Mon 12/6/21</b>	<b>Mon 5/29/23</b>			<b>40%</b>
11	<b>Volume 3 Response to comments (Schedule assumes 151 comment letters; 895 comments)</b>	<b>247 days</b>	<b>Mon 12/6/21</b>	<b>Tue 11/15/22</b>			<b>52%</b>
12	Authority/Integration post comment letters to SharePoint daily (101 letters received & as of 2/22 -1,053 comments)	45 days	Mon 12/6/21	Fri 2/4/22	6FF+5 days		100%
13	ICF review, categorize, and enter comments into database (Generate RTC tables)	49 days	Wed 12/15/21	Mon 2/21/22	6SS		100%
14	Prepare Response to Comment Guidance (Distinguish between substantive and non-substantive comments &	6 days	Mon 1/31/22	Mon 2/7/22	6		100%
15	Authority/Legal/Reclamation review RTC Guidance	8 days	Tue 2/8/22	Thu 2/17/22	14		100%
16	ICF revise RTC Guidance	8 days	Fri 2/18/22	Tue 3/1/22	15		100%
17	ICF prepare Draft Vol 3 Introduction (Driven by approval of the Guidance Document & Generally includes stats re	10 days	Fri 2/18/22	Thu 3/3/22	16SS		100%
18	Authority/Legal/Reclamation review of Draft Vol 3 Introductio	8 days	Fri 3/4/22	Tue 3/15/22	17		100%
19	ICF prepare draft outlines of Master Responses (Based on review of comment response tables)	30 days	Tue 2/22/22	Mon 4/4/22	13		100%
20	Authority/Legal/Reclamation review of draft outlines of Master Responses	18 days	Tue 4/5/22	Thu 4/28/22	19		100%
21	<b>Preparation of draft Master Responses &amp; Action Code Tables</b>	<b>127 days</b>	<b>Fri 4/29/22</b>	<b>Mon 10/24/22</b>	<b>20</b>	<b>22</b>	<b>0%</b>
22	<b>Batch 1 - MR 1, 6, 7 &amp; 9 and associated Action Code Tables</b>	<b>83 days</b>	<b>Fri 4/29/22</b>	<b>Tue 8/23/22</b>			<b>0%</b>
23	ICF submit MRs & Action Code Tables to Integration and Reclamation (including BDO &/or Solicitors office)	61 days	Fri 4/29/22	Fri 7/22/22	20	6	0%
24	Integration, Legal, Authority and Reclamation review Bat	10 days	Mon 7/25/22	Fri 8/5/22	23	16	0%
25	Integration consolidates and resolves conflicting comments to send to ICF	2 days	Mon 8/8/22	Tue 8/9/22	24	18	0%
26	ICF updates MR and Action Code Tables & CAT Team inputs responses into database & produces draft RTC tables for each letter	10 days	Wed 8/10/22	Tue 8/23/22	25	28	0%
27	<b>Batch 2 - ICF submit MR 2 &amp; 8 and associated Action Code</b>	<b>28 days</b>	<b>Wed 8/10/22</b>	<b>Fri 9/16/22</b>			<b>0%</b>
28	ICF reviews comments received on Batch 1 for global edits that need to be made to Batch 2	5 days	Wed 8/10/22	Tue 8/16/22	20,25	23	0%

Sites\_ICF\_InternalSchedule\_07122022

ID	Task Name	Duration	Start	Finish	Predecessors	Workday Countdown	% Complete
29	ICF submit MRs & Action Code Tables to Integration and Reclamation (including BDO &/or Solicitors office)	1 day	Wed 8/17/22	Wed 8/17/22	28	24	0%
30	Integration, Legal, Authority and Reclamation review Batch 1	10 days	Thu 8/18/22	Wed 8/31/22	29	34	0%
31	Integration consolidates and resolves conflicting comments to send to ICF	2 days	Thu 9/1/22	Fri 9/2/22	30	36	0%
32	ICF updates MR and Action Code Tables & CAT Team inputs responses into database & produces draft RTC tables for each letter	10 days	Mon 9/5/22	Fri 9/16/22	31	46	0%
33	<b>Batch 3 - ICF submit MR 3, 4 &amp; 5 and associated Action Code Tables</b>	<b>54 days</b>	<b>Wed 8/10/22</b>	<b>Mon 10/24/22</b>			<b>0%</b>
34	ICF reviews comments received on Batch 1 for global edits that need to be made to Batch 2	5 days	Wed 8/10/22	Tue 8/16/22	25	23	0%
35	Jacobs completes MR3 and associated Action Code Table	0 days	Fri 9/2/22	Fri 9/2/22		35	0%
36	ICF submit MRs & Action Code Tables to Integration and Reclamation (including BDO &/or Solicitors office)	15 days	Fri 9/2/22	Thu 9/22/22	20,34,35	50	0%
37	Integration, Legal, Authority and Reclamation review Batch 2	10 days	Fri 9/23/22	Thu 10/6/22	36	60	0%
38	Integration consolidates and resolves conflicting comments to send to ICF	2 days	Fri 10/7/22	Mon 10/10/22	37	62	0%
39	ICF updates MR and Action Code Tables & CAT Team inputs responses into database & produces draft RTC tables for each letter	10 days	Tue 10/11/22	Mon 10/24/22	38	72	0%
40	Final review and cross check of Action Code Tables	10 days	Tue 10/25/22	Mon 11/7/22	39,26,32	82	0%
41	ICF CAT Team generates letter tables & QA/QC for Volume 3	6 days	Tue 11/8/22	Tue 11/15/22	40	88	0%
42	<b>Volumes 1 &amp; 2 Admin Draft Final EIR/EIS</b>	<b>141 days</b>	<b>Fri 4/8/22</b>	<b>Fri 10/21/22</b>			<b>58%</b>
43	<b>Receive revised modeling for Alts 1A, 1B and 3A (25% without climate change) to complete RTC &amp; Update</b>	<b>66 days</b>	<b>Fri 4/8/22</b>	<b>Fri 7/8/22</b>		<b>29</b>	<b>81%</b>
44	Jacobs provides to ICF CalSim Modeling	6 wks	Fri 4/8/22	Thu 5/19/22			100%
45	Jacobs provides to ICF USRDOM Upper Sac daily flow data	12 days	Fri 5/20/22	Mon 6/6/22	44		100%
46	Jacobs provides to ICF Anderson-Martin Egg Mortality	5.4 wks	Fri 5/20/22	Mon 6/27/22	44		100%
47	Jacobs provides to ICF Bypass and Side-Channel Inundated Habitat area analysis (suitable floodplain habitat)	5.2 wks	Fri 5/20/22	Fri 6/24/22	44		100%
48	Jacobs provides to ICF SALMOD	5.4 wks	Fri 5/20/22	Mon 6/27/22	44		100%
49	Jacobs provides to ICF DSM2	2 wks	Tue 5/24/22	Mon 6/6/22	44		100%
50	Jacobs provides to ICF OBAN (QEDA)	4 wks	Mon 6/13/22	Fri 7/8/22	44		0%
51	Jacobs provides to ICF IOS and DPM (Cramer)	4 wks	Fri 5/27/22	Thu 6/23/22	44		100%

Sites\_ICF\_InternalSchedule\_07122022

ID	Task Name	Duration	Start	Finish	Predecessors	Workday Countdown	% Complete
52	Jacobs provides to ICF Reclamation Temp Model & HEC5Q for Sacramento River	2 wks	Mon 5/23/22	Sun 6/5/22	44		100%
53	Jacobs provides to ICF Reservoir Water Quality/Temp	4 wks	Fri 6/3/22	Thu 6/30/22	44		100%
54	Jacobs provides to ICF Power (LTGen, SWP_Power, & Sites_Power)	3 wks	Mon 5/23/22	Fri 6/10/22	44		100%
55	Jacobs provides to ICF CalSim II (2035CT & WSIP 2070)	3 wks	Tue 6/7/22	Mon 6/27/22	44		100%
56	ICF produces Salvage Density using CalSim output	3 wks	Fri 5/20/22	Thu 6/9/22	44		0%
57	Jacobs provides to ICF Daily Divertible and Storable Flow To	0 wks	Thu 6/2/22	Thu 6/2/22	44		100%
58	ICF produces Weighted Usable Area using CalSim output	3 wks	Fri 5/20/22	Thu 6/9/22	44		0%
59	Jacobs provides Climate Change modeling output	10 days	Tue 6/28/22	Mon 7/11/22	55		100%
60	Jacobs provides Socioeconomic Sensitivity Results in an Appen	35 days	Fri 5/20/22	Thu 7/7/22	44		0%
61	Analyze new modeling output	15 days	Mon 7/11/22	Fri 7/29/22	50	11	0%
62	 Integration and Reclamation Draft Appendix 4C - Reclamation Responses to 2017 Draft EIS Comments	60 days	Mon 8/1/22	Fri 10/21/22		71	0%
63	ICF review and potentially qualitatively update 14 chapters Chps 7 Fluvial Geo, 8 GW; 9 VegWetlands; 10 Wildlife; 11 Aquatic Bio; 12 Geo; 13 Minerals; 14 LU; 15 Ag; 19 Noise; 22 CR; 24 Visual; 27 Pub Health; 30 EJ	60 days	Tue 2/8/22	Mon 5/2/22	14		100%
64	Jacobs provides Alt 2 modeling output	3 wks	Mon 7/11/22	Fri 7/29/22		11	0%
65	ICF review 17 chapters and potentially quantitatively update impact analysis in those 17 chapters and supporting appendices	40 days	Mon 8/1/22	Fri 9/23/22	58,64	51	0%
66	Jacobs updates applicable appendices with new modeling data	20 days	Tue 7/12/22	Mon 8/8/22	59	17	0%
67	Prepare Draft MMRP (Assumes no change to any mitigation as a result of chapter updates (tasks 37/38))	35 days	Thu 10/27/22	Wed 12/14/22	323	109	0%
68	Authority/Reclamation/Attorney review of the Draft MMRP	15 days	Thu 12/15/22	Wed 1/4/23	67	124	0%
69	ICF finalize MMRP	15 days	Thu 1/5/23	Wed 1/25/23	68	139	0%
70	Compile tracked changes of Volumes 1 & 2 to address project description changes, new modeling analysis (inc Alt 2) and RTC	20 days	Mon 9/26/22	Fri 10/21/22	63,65	71	0%
71	<b>Admin Final EIR/EIS &amp; Public Final EIR/EIS</b>	<b>156 days</b>	<b>Mon 10/24/22</b>	<b>Mon 5/29/23</b>			<b>0%</b>
72	Reclamation BDO staff/Cooperating Agencies/Authority/Legal review Volumes 1 & 2 tracked changes	20 days	Mon 10/24/22	Fri 11/18/22	70	91	0%
73	Integration reconciles conflicting comments, provide direction on priority comments	5 days	Mon 11/21/22	Fri 11/25/22	72	96	0%

Sites\_ICF\_InternalSchedule\_07122022

ID	Task Name	Duration	Start	Finish	Predecessors	Workday Countdown	% Complete
74	ICF revises Vol 1, 2 & 3 (updated to address reviewers comments using comment bubbles or highlights to	35 days	Mon 11/28/22	Fri 1/13/23	73,41	131	0%
75	Reclamation drafts ROD	20 days	Mon 1/16/23	Fri 2/10/23	74	151	0%
76	ICF compiles Vol 1, 2 & 3 (prepare doc w/vertical lines) for Screencheck review	15 days	Mon 1/23/23	Fri 2/10/23	74FS+5 days,62	151	0%
77	ADA compliance (Assumes 1,900 pgs Vol 1; 7,000 pgs Vol 2; 2,000 pgs Vol 3)	15 days	Mon 2/13/23	Fri 3/3/23	76	166	0%
78	Regional Reclamation staff review (Reg Dep Dir and Solicitor)	2 wks	Mon 3/6/23	Fri 3/17/23	77,75	176	0%
79	ICF backchecks comments received	5 days	Mon 3/20/23	Fri 3/24/23	78	181	0%
80	Reclamation SES and legal review of ADA compliant document	2 wks	Mon 3/27/23	Fri 4/7/23	79	191	0%
81	Reclamation obtains ROD clearance from HQ and requests briefing (DOI, as appropriate)	3 wks	Mon 4/10/23	Fri 4/28/23	77,80	206	0%
82	Authority/Legal Draft Findings and Statement of Overriding Considerations	20 days	Mon 1/16/23	Fri 2/10/23	74	151	0%
83	ICF reviews Findings and Statement of Overriding Considerations	5 days	Mon 2/13/23	Fri 2/17/23	82	156	0%
84	CEQA Publication	1 day	Mon 3/6/23	Mon 3/6/23	83,77	167	0%
85	Reclamation obtains clearance for public release of Final EIS & ROD (Assumes all Reclamation levels of review and comments addressed prior to the start of this Task)	20 days	Mon 5/1/23	Fri 5/26/23	81	226	0%
86	NEPA Publication (Date is dependent/predecessors on the finalization of the BiOp and PA)	1 day	Mon 5/29/23	Mon 5/29/23	85,151,98	227	0%
87	<b>Permits and Agreements</b>	<b>2100 days</b>	<b>Fri 9/17/21</b>	<b>Thu 10/4/29</b>			<b>11%</b>
343	<b>Geotechnical Investigations</b>	<b>647 days</b>	<b>Thu 7/1/21</b>	<b>Fri 12/22/23</b>			<b>0%</b>

**File Provided Natively**

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**From:** Fritz Durst [fdurst@rd108.org]  
**Sent:** 7/20/2022 4:32:25 PM  
**To:** Jerry Brown [jbrown@sitesproject.org]; Alicia Forsythe [aforsythe@sitesproject.org]  
**Subject:** Fwd: July 21st Agenda Item on Sites  
**Attachments:** BolesJerryCommentsDEIS\_EIR\_SitesNov2017\_2.pdf; BolesSitesDEIR2\_010722.pdf

I'm sure you have heard from this Boles guy

Sent from my iPad  
Fritz Durst  
530.304.5111

Begin forwarded message:

**From:** Lewis Bair <LBair@rd108.org>  
**Date:** July 20, 2022 at 4:24:05 PM PDT  
**To:** Fritz Durst <FDurst@rd108.org>, William Vanderwaal <WVanderwaal@rd108.org>  
**Subject:** FW: July 21st Agenda Item on Sites

fyi

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**From:** Barbara Vlamis <barbarav@aqualliance.net>  
**Date:** Wednesday, July 20, 2022 at 4:17 PM  
**To:** Lewis Bair <lbair@rd108.org>  
**Cc:** Jim Brobeck <jimb@aqualliance.net>  
**Subject:** July 21st Agenda Item on Sites

Hi Lewis, I left you a message on your cell. Per that message, here are the attached comments of Jerry Boles, former head of water quality for DWR in Red Bluff, on the Sites' EIS/Rs in 2017 and 2022. Really wanted to make sure you know about the serious water quality implications for Sites and what water from that potential reservoir could do to the land.

Feel free to call me if you would like to speak about this.

Barbara

--

Barbara Vlamis  
Executive Director  
AquAlliance  
P.O. Box 4024  
Chico, CA 95927  
(530) 895-9420  
[www.aqualliance.net](http://www.aqualliance.net)

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4314 Tuliyani Drive  
Chico, CA 95973  
November 17, 2017

Bureau of Reclamation  
Attn: Michael Dietle  
Draft EIR/EIS Comments  
2800 Cottage Way, W-2830  
Sacramento, CA 95825

Sites Project Office  
Attn: Rob Thomson  
Draft EIR/EIS Comments  
P.O. Box 517  
Maxwell, CA 95955

I am providing to you my comments in response to the Draft Environmental Impact Report/Environmental Impact Statement for the Sites Reservoir Project, State Clearinghouse #2001112009.

The draft EIR/EIS fails to discuss the high concentrations of a number of metals in the source waters to the proposed project, and, even more important, does not discuss water quality in the proposed reservoir. Water quality in the proposed reservoir will mimic that of the source waters, and hence the reservoir will have concentrations of a large number of metals that exceed many water quality criteria and standards. The high concentrations of metals likely to occur in the proposed reservoir will impact most, if not all, beneficial uses of the proposed project, including agricultural water supply, wildlife and fisheries, and drinking water supplies for communities that divert water from the Sacramento River, making the project potentially infeasible.

The water quality section (Chapter 7) must be completely rewritten with an objective analysis of the data and potential adverse impacts to water quality both within the reservoir and to downstream resources in the Sacramento River. Subsequently, the aquatic biological resources (chapter 12), terrestrial biological resources (chapter 14), recreation resources (chapter 21), public health and environmental hazards (chapter 28), and cumulative impacts (chapter 35) sections of the draft EIR/EIS must reassess impacts from the adverse water quality expected from the proposed project. Following these re-analyses, re-circulation of the draft EIR/EIS is necessary with appropriate disclosure information about the potential impacts from metals to water quality and its effects on agricultural water supply, wildlife and fisheries, and drinking water supplies.

I am qualified to provide these comments since my background is in water quality, as former Chief of the Water Quality and Biology Section of the Northern District of DWR in Red Bluff.

If you have any questions, please contact me via email at [chicojerry@yahoo.com](mailto:chicojerry@yahoo.com).

Sincerely,

Jerry Boles

## **Comments on Draft EIR Sites Reservoir Project: Chapter 7 Surface Water Quality**

An EIR is supposed to be a disclosure document that provides information on the benefits as well as potential impacts from a proposed project. Section 7 - Surface Water Quality does not disclose potential significant adverse issues which have serious ramifications for the viability of the proposed project, but rather ignores or misconstrues available data and reports to incorrectly conclude that there are no significant water quality impacts associated with the proposed project. The EIR claims to have evaluated post-project impacts to the Sacramento River, but there are no analyses provided that indicate that this was done. It is apparent that the preparers of the EIR failed to examine or simply ignored the available data that would show potential significant adverse impacts from the proposed project.

The analyses in Section 7 completely left out any evaluation or projection of water quality that may result in Sites Reservoir from diverting high winter flows from the Sacramento River. The EIR fails to point out that due to metals loads in the various source waters, water in the proposed reservoir may not be suitable for the beneficial uses stated for the proposed project, including enhanced water management flexibility, agricultural and urban water supply, water quality improvement, and ecosystem improvement for fish protection, habitat management, and other environmental needs.

A factual evaluation of the available data is presented below, which shows significant potential adverse impacts associated with the proposed project. Some comments on specific sections of Chapter 7 of the EIR are also presented.

### Available Data

The EIR cites the DWR Water Data Library (WDL) online database as the source for water quality data used to determine impacts from the proposed project. However, very limited data from the WDL are available for evaluating water quality in source waters for the proposed project. The major source water for the proposed project is the Sacramento River, with potential diversion occurring at the Tehama-Colusa Canal, Glenn-Colusa Irrigation District Main Canal, and at Moulton Weir.

The Sacramento River below the Red Bluff Diversion Dam monitoring station of DWR provides information on the quality of water that would be diverted to the proposed project through the Tehama-Colusa Canal. Metals data are available in the WDL for the Sacramento River below the Red Bluff Diversion Dam beginning in February 2006 (Table 1). However, only 33 samples have been collected since 2006, and only nine of these were from the months in which higher flows most typically occur (December through March) and from which diversions to the proposed project would occur.

Cottonwood Creek contributes the most significant input to the Sacramento River during high runoff events. The Chico-Enterprise Record in an editorial published December 28, 2016 underscored the impact of tributaries on water quality in the Sacramento River. The newspaper stated that of the 100,000 cfs flowing in the river earlier in the month,

only 5,000 cfs was coming from Keswick Dam below Shasta Dam – the rest of the 100,000 cfs (95,000 cfs) was coming from tributaries downstream from Keswick Dam, of which Cottonwood Creek provides the dominant flows.

Data from Cottonwood Creek near Cottonwood are even more sporadic than those for the Sacramento River. Data are available for this station in WDL beginning in October 2004, with only seven samples collected from the Cottonwood Creek monitoring station since 2006, and only four of which were collected during the months of expected higher flows of December through March (Table 2). Data available in the WDL show that only one sample was collected (March 2006) during the same period from both Cottonwood Creek and the Sacramento River below the Red Bluff Diversion Dam since 2006. This one sample shows that metal loads in the Sacramento River are similar to those found in Cottonwood Creek, showing that Cottonwood Creek significantly affects water quality in the Sacramento River. Water quality in Cottonwood Creek will have a significant impact on diversions to the proposed reservoir and water quality data from Cottonwood Creek can be used to approximate and supplement data from the Sacramento River, though the total number of samples from both sites combined are still exceptionally low for a project of this magnitude and potential for adverse effects.

The water quality monitoring station on the Sacramento River at Hamilton City is just downstream from the GCID Main Canal. Data from the WDL is somewhat more extensive at the Hamilton City monitoring site, with metals data available in the WDL beginning in late 2003 to early 2017, though still sporadic with only 78 samples collected in the span of a little more than 13 years (159 months), and only 23 of those collected sometime during the months of expected higher flows of December through March (Table 3). Samples were collected in each of these months only twice, with the rest of the samples during these months only collected in February months each year since 2008.

The WDL shows that metals data are available for the Sacramento River opposite Moulton Weir monitoring station from mid 2003 to early 2011, for a total of 80 samples, with 27 of those from the expected higher flow months (Table 4).

Water quality sampling during the expected months of higher flows of December through March did not target high flow periods (the periods during which diversions to the proposed project would occur) but were based on a rigid and fixed monthly or semi-monthly schedule. Monitoring did not provide any information on the variation in concentrations of metals over the runoff hydrograph. Even higher concentrations of metals would likely occur during the higher flow periods during these months, but were not targeted by the limited monitoring. The relatively low number of samples and lack of samples targeting critical flows (i.e., high runoff events) are nonetheless sufficient to indicate potential significant adverse water quality impacts with the proposed project. These data illustrate the need to collect additional data during appropriate time periods (i.e., during the high flow periods when diversions from the Sacramento River would be occurring) and re-evaluate the potential adverse water quality impacts from the proposed project.

## Data Analyses

Some of the analytical results shown in the WDL for metals are reported as “dissolved” and other results as “total” (or total recoverable). “Total” concentrations, which include both dissolved and particulate forms of an analyte, are probably a better representation for the concentrations of metals that will affect water quality in the proposed reservoir. As well, the State Water Resources Control Board makes no distinction between dissolved or total recoverable concentrations when considering whether a criterion is exceeded (SWRCB 2011). The proposed reservoir will thermally stratify and will also be biologically productive due to nutrients brought in from source waters. This in-situ productivity, as well as organic material brought in with the source waters, will result in anoxic conditions (i.e., lack of oxygen) in the hypolimnion (i.e., bottom water layer). While dissolved forms of metals are generally the most bioavailable, the particulate fraction of total recoverable forms will undergo chemical transformation to dissolved forms under the anoxic conditions expected in the hypolimnion of the proposed reservoir. Transformed metals will be mixed throughout the reservoir water column during turnover events, or released downstream with anoxic water from the lower depths during the summer months.

Data from the WDL (Table 1) show that aluminum, arsenic, cadmium, chromium, iron, lead, manganese, and mercury in water samples from the Sacramento River below the Red Bluff Diversion Dam exceed various criteria and standards established to protect beneficial uses, including drinking water, public health, taste and odor for agriculture, and freshwater organisms, which includes fish. Maximum concentrations of some of these metals are many times higher than the corresponding criteria or standard. For example, aluminum, in addition to exceeding the SWRCB Basin Plan Primary Maximum Contaminant Level (MCL) for drinking water by one and half times, also exceeds the secondary drinking water standard in the Basin Plan by seven times and the US Environmental Protection Agency Secondary MCL by 30 times. Even the minimum concentration of arsenic reported in WDL exceeds by more than 10 times nearly all the criteria and standards for protection of human health. The least reported concentration of cadmium from river water samples exceed by five times the incremental cancer risk for drinking water. The least concentration of chromium reported in WDL exceeds the California Public Health Goal by 16 times and incremental cancer risk for drinking water by five times. The maximum concentration of iron that was reported in WDL exceeds the secondary drinking water maximum concentration level in the Basin Plan, as well as National Recommended Water Quality Criteria for taste and odor or welfare by nearly three times. The maximum concentration of lead that was reported exceeds the California Public Health Goal and California Proposition 65 maximum allowable dose level for reproductive toxicity by over four times. The maximum reported concentration of manganese exceeds the National Recommended Water Quality Criteria for taste and odor or welfare by one and a half times. The maximum concentration reported for mercury exceeds the National Recommended Water Quality Criteria for Freshwater Aquatic Life Continuous Concentration by nearly four times, and the Freshwater Aquatic Life Maximum Concentration by two times. An additional concern with these metals is that some metals are taken up by crops (such as arsenic by rice), making the crops

potentially unsuitable for consumption. Plant uptake of metals in the water supply not only affect crops grown for human consumption, but also plants grown for support of wildlife, such as in refuges.

Similarly, data from the WDL for Cottonwood Creek near Cottonwood show that aluminum, arsenic, cadmium, iron, lead, manganese, and nickel exceed various criteria and standards established to protect beneficial uses (Table 2). Similar to the Sacramento River, maximum concentrations of some of these metals are many times higher than the corresponding criteria or standards. Aluminum concentrations exceed the Basin Plan drinking water primary standard MCL by 14 times, the secondary drinking water secondary standard MCL by 70 times, the California Public Health Goal by over 20 times, the National Academy of Sciences Health Advisory and Agriculture Water Quality Goals for taste and odor threshold by nearly three times, the National Recommended Water Quality Criteria for human health and welfare for water and fish consumption by nearly 30 times, and the National Recommended Water Quality Criteria for freshwater aquatic life maximum concentration by 20 times. As with the Sacramento River, even the minimum concentration of arsenic reported in WDL exceeds nearly all the criteria and standards for protection of human health by up to 167 times. The minimum concentration of cadmium reported exceeds the incremental cancer risk for drinking water by over three times, while the maximum concentration is over twice as high as the California Public Health Goal. As with the Sacramento River, the California Public Health Goal is exceeded by the least concentration of chromium reported by 16 times and the incremental cancer risk for drinking water by five times. Iron exceeds the Basin Plan drinking water standard secondary MCL by over five times, the Agricultural Water Quality Goals for taste and odor threshold by nearly five times, the National Recommended Water Quality Criteria for taste and odor or welfare by 78 times, and the National Recommended Water Quality Criteria for freshwater aquatic life maximum concentration by over 23 times. Reported lead concentrations are two and a half times higher than the California Public Health Goal, up to twice as high as the California Proposition 65 maximum allowable dose level for reproductive toxicity, and almost twice as high as the incremental cancer risk estimate for drinking water. Manganese concentrations reported from Cottonwood Creek exceed the Basin Plan Drinking Water Standards secondary MCL by a factor of 10, are nearly twice as high as the USEPA Health Advisory for drinking water, three times as high as the Agricultural Water Quality Goals for taste and odor threshold, and over 10 times higher than the National Recommended Water Quality Criteria for taste and odor or welfare. Reported maximum mercury concentrations exceed the National Recommended Water Quality Criteria for Freshwater Aquatic Life Continuous Concentration by nearly two times, while even the lowest reported concentration is nearly equal to the recommended criterion. Nickel exceeds the California Public Health Goal by nearly five times.

The GCID Main Canal intake is slightly upstream from the Sacramento River at Hamilton City water quality monitoring station. Therefore, water quality in the GCID Main Canal will be similar to that found at the Sacramento River at Hamilton City monitoring station. Metals data for this monitoring station can be found in the WDL from November 2003 to February 2017. Similar to the upstream monitoring station on the

Sacramento River below Red Bluff, the Sacramento River at Hamilton City water quality monitoring station has been identified to contain high levels of aluminum, arsenic, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel, selenium, silver, and zinc (Table 3), which exceed a large number of criteria and standards similar to those upstream at the monitoring station below the Red Bluff Diversion Dam.

High levels of metals have also been identified at the water quality monitoring station opposite the Moulton Weir, including aluminum, arsenic, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel, selenium, silver, and zinc (Table 4). As with the water quality monitoring station on the Sacramento River below the Red Bluff Diversion Dam, concentrations of metals from the Sacramento River monitoring station at the Moulton Weir exceed a large number of water quality criteria designed to protect beneficial uses.

As discussed earlier, Cottonwood Creek is the major source of water to the Sacramento River during higher flow periods, but other tributaries also contribute high levels of metals to the Sacramento River. In addition, local creeks directly tributary to the proposed reservoir, such as Funks Creek and Stone Corral Creek, also carry metals concentrations that will contribute to the metals loading. Leaching from soils beneath the reservoir will also contribute additional metals, as well as nutrients.

The Basin Plan lists other chemicals that adversely affect water quality in the Sacramento River, including chlorpyrifos and diazinon. The California State Water Resources Control Board lists a number of other "constituents of concern" in the study area, including chlordane, DDT, mercury, PCBs, and dieldrin. In addition, sewer outfalls from the cities of Redding and Red Bluff contribute other contaminants, such as pharmaceuticals, to the Sacramento River. No information is provided in the EIR about effects to the proposed project from these chemical contaminants.

### Discussion

The data in the WDL for the Sacramento River and Cottonwood Creek demonstrate that high concentrations of metals can be expected during the high flow months of winter (December through March) when diversions would be occurring to the proposed Sites Reservoir. Higher concentrations of metals are likely during the higher flows that can occur during these months. Such higher flows were not targeted by the limited sampling effort presented in the WDL. The high concentrations of metals in the source water will adversely impact water quality in the proposed reservoir for most, if not all, the proposed beneficial uses of the stored water.

Some metals from both the Sacramento River and Cottonwood Creek, whose concentrations did not exceed criteria in the limited sampling effort, had concentrations that nearly exceed the criteria and standards. These and other metals whose concentrations did not exceed the criteria may have higher concentrations during the higher flow periods that the proposed project would be diverting. Again, these higher flow periods were not targeted during the limited sampling effort.

Even some of the minimum concentrations of metals found in the source waters exceed criteria and standards, which means that the source waters never meet these goals and standards – the criteria are always exceeded and the water is never suitable for the beneficial use or uses the criteria or standards were designed to protect. Water quality in the proposed reservoir for these parameters will exceed the criteria and standards all the time.

Since water quality in the proposed reservoir will reflect that of the source waters, the reservoir will have concentrations of numerous metals, including aluminum, arsenic, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel, selenium, silver, and zinc, that exceed a number of criteria and standards developed to protect beneficial uses. In addition, other metals that may not exceed criteria and standards in the source waters may adversely affect reservoir water quality due to synergistic effects. The State Water Resources Control Board (SWRCB 2011) states that “when multiple constituents have been found together in groundwater or surface waters, their combined toxicity should be evaluated” and that “theoretical risks from chemicals found together in a water body shall be considered additive for all chemicals having similar toxicologic effects or having carcinogenic effects.” Thus, the adverse effects from the metals delivered to the proposed reservoir from the source waters may have an even greater adverse impact and pose an unacceptable level of risk. Beneficial uses potentially impacted by metals in the proposed reservoir include agricultural water supply (direct toxicity or uptake by crops making the crops unsuitable for use), wildlife (such as fish-eating birds), fisheries, recreation (including sport fishing and water contact activities such as swimming), and drinking water supplies for communities that divert water from the Sacramento River.

Releases from the proposed reservoir would occur during the summer when metals concentrations in the Sacramento River are much lower due to the majority of flow being from Shasta Reservoir, with much better water quality, though still carrying a metals load. High metals concentrations in the proposed reservoir releases could adversely affect water quality in the Sacramento River during the summer months by increasing metals loads beyond acceptable limits and adversely impact beneficial uses.

Though high concentrations of metals that exceed water quality criteria exist in source waters to the proposed project, they cannot be regulated by governmental entities since they are natural occurrences. However, once contained artificially in a reservoir, they are subject to jurisdictional control by regulatory agencies. Any releases of water from the proposed reservoir will likely be subject to review by water quality regulatory agencies to ensure that such releases do not adversely affect downstream resources due to the heavy metals loads in the releases. The SWRCB has an antidegradation policy that prohibits discharges that would degrade water quality to a level below water quality objectives because no capacity would exist for degradation that will be caused by the next downstream or downgradient uses – the ability to beneficially use the water would have been impaired, even though water quality objectives would not yet have been exceeded (SWRCB 2011). The contribution of additional metal loads from releases from the proposed Sites Reservoir during the summer could cause

concentrations of metals in the Sacramento River to exceed criteria and standards or at least be subject to the antidegradation policy due to an incremental increase in metals in the Sacramento River from the proposed project. Thus, the proposed project may face prohibition of releases if stored water does not meet water quality criteria or standards or if releases can cause criteria or standards to be exceeded by downstream inputs (i.e., antidegradation policy).

During dry years, the adverse impacts associated with the project can be expected to be even greater. Flows in the Sacramento River from upstream reservoirs on the Sacramento River (i.e., Shasta Reservoir, Whiskeytown Reservoir) will be minimized during the winter months in an effort to restore water storage levels in those reservoirs. Likewise, during wet or even normal runoff years, releases from the upstream reservoirs during the winter will be curtailed during high runoff periods to prevent downstream flooding. In any of these scenarios, tributary influences, such as Cottonwood Creek, on water quality in the Sacramento River will be much greater. The proposed project would still attempt to capture as much runoff from the Sacramento River as possible, but the water diverted to the proposed project will have even greater concentrations of metals due to the majority of flow being from tributary streams (e.g., Cottonwood Creek) during dry and possibly even wet or normal runoff years.

Similarly, during the summer in dry years, releases from upstream reservoirs (i.e., Shasta Reservoir, Whiskeytown Reservoir) will be minimized. Releases to the Sacramento River from the proposed project will have a greater impact on water quality in the Sacramento River due to less dilution being available due to curtailed flows in the river from upstream reservoirs (i.e., Shasta and Whiskeytown reservoirs).

### Conclusion

The proposed project is, at best, premature. Little or no data have been collected to determine the metals loads in the higher flows of the Sacramento River that would be diverted to the proposed reservoir. An extremely small amount of data have been collected during the months in which higher flows can be expected (December through March), but higher flows during these months were not targeted in the water quality sampling. None the less, the limited data presented in the WDL show high concentrations of a number of metals which exceed numerous water quality criteria and standards in the source waters for the proposed reservoir. Extremely high concentrations of metals are present in the small streams in the reservoir footprint, which occur due to the nature of the soils in the area of the proposed reservoir. Sites Reservoir would inundate these soils resulting in leaching of metals and further incremental loading of metals to the proposed reservoir. There is no discussion in the EIR about the potential impacts of metals leaching from the soils that would be inundated by the proposed reservoir. Prior to moving forward with the project, much additional data are needed during the high flow periods in which diversions would occur from the Sacramento River, metals loading from the smaller tributaries that flow directly into the proposed reservoir, and effects from leaching of metals from soils inundated by the proposed reservoir.

The limited data that are available are sufficient to show that water quality in the proposed reservoir will have concentrations of a large number of metals that exceed many water quality criteria and standards, including those established for the protection of agricultural water supply, wildlife and fisheries, and drinking water. Metals bioaccumulation in the reservoir food web could produce adverse impacts to fish-eating birds and other animals, as well as humans, and adversely affect any potential recreational benefit from the project. Releases from the proposed reservoir could adversely affect downstream resources, including agricultural water supply, wildlife and fisheries, and drinking water supplies for communities that divert water from the Sacramento River.

Also, the EIR does not discuss the physical conditions that can be expected to occur in the proposed reservoir. Like other nearby reservoirs, the proposed reservoir will thermally stratify during the summer months, with a warm upper water layer and a cooler lower water layer. The proposed reservoir will also be biologically productive due to nutrients brought in with source waters. The biological productivity will lead to anoxic conditions (i.e., lack of oxygen) in the hypolimnion (i.e., bottom water layer). Depending on the depth from which downstream releases are made from the proposed reservoir, water released will either be warm and unsupportive of cold water fisheries in the Sacramento River (i.e., migrating salmon) or cooler but devoid of oxygen. As releases from the reservoir progress during the summer, or in years in which the reservoir is not completely filled, the reservoir will be warm from surface to bottom as the cooler lower water strata is depleted from releases or wind mixing of the upper warm water layer. Under these conditions, only warm water would be available for release from the proposed reservoir, which would not be supportive of the cold water fishery in the Sacramento River.

An EIR is a disclosure document meant to disclose pertinent project information to planners, regulatory agencies, and other interested parties and the public. This EIR did not disclose the potential impacts from metals, other contaminants, nor the physical conditions likely to exist in the proposed reservoir. The little analyses presented in the EIR misconstrues, misinterprets, and ignores water quality data that amply demonstrate significant potential adverse impacts from the proposed project. The water quality section (Chapter 7) must be completely rewritten with an objective analysis of the data and potential adverse impacts to water quality both within the reservoir and to downstream resources in the Sacramento River. Subsequently, the aquatic biological resources (chapter 12), terrestrial biological resources (chapter 14), recreation resources (chapter 21), public health and environmental hazards (chapter 28), and cumulative impacts (chapter 35) sections of the EIR must reassess impacts from the adverse water quality expected from the proposed project. Whether any of the projected beneficial uses from the proposed project can be realized, and its feasibility to meet project objectives, purpose, and need, also needs to be reconsidered in light of the potential significant adverse water quality impacts from metals. Following these re-analyses, re-circulation of the EIR is necessary with appropriate disclosure information about the potential impacts from metals to water quality and its effects on agricultural

water supply, wildlife and fisheries, and drinking water supplies for communities that divert water from the Sacramento River.

EIR Needs:

- Obtain additional metals data from source waters targeting high flows from which diversions would occur
- Provide information on the water quality impacts from other chemical contaminants that adversely affect water quality in the Sacramento River (including chlorpyrifos, diazinon, chlordane, DDT, mercury, PCBs, and dieldrin) and contaminants in sewer outfalls (such as pharmaceuticals) and other discharges (such as industrial discharges)
- Evaluate the contributions of metals from local tributaries (i.e., Funks Creek and Stone Corral Creek) to the proposed reservoir
- Provide information on the contribution from leaching of metals from the inundation area of the proposed reservoir
- Evaluate effects of metals to beneficial uses within the proposed reservoir
  - fisheries,
  - wildlife (including state and federal species listed as threatened or endangered),
  - recreation
- Evaluate effects of metals to beneficial uses due to releases from the reservoir
  - agricultural supply water,
  - effects of metals on crops including incorporation of metals by crops (e.g., arsenic uptake in rice),
  - effects of metals on plants grown for support of wildlife (such as in wildlife refuges),
  - drinking water supplies,
  - fisheries,
  - wildlife (including state and federal species listed as threatened or endangered),
- Evaluate combined toxicity of multiple metals
- Evaluate contributions of metals in reservoir releases related to the SWRCB antidegradation policy
- Evaluate impacts from mercury bioaccumulation in aquatic life (especially fish) in the proposed reservoir, and effects to wildlife that feed on fish from the reservoir and recreational opportunities (i.e., sport fishing)
- Evaluate physical conditions expected in the reservoir, including thermal stratification and hypolimnetic anoxia, and effects on reservoir and downstream aquatic resources
- Conduct re-analysis of impacts due to metals, other contaminants, and physical conditions in the proposed reservoir on:
  - water quality (chapter 7),
  - aquatic biological resources (chapter 12),
  - terrestrial biological resources (chapter 14),
  - recreation resources (chapter 21),

- public health and environmental hazards (chapter 28), and
- cumulative impacts (chapter 35).

## Comments on Specific Sections of EIR

### **7.2.1.5 Other Heavy Metals**

*“In addition to mercury and selenium, other heavy metals, including cadmium, copper, and zinc, impair beneficial uses of water bodies. Cadmium, copper, and zinc enter the water bodies with the sediment from eroded soils and discharges from abandoned mines, and in stormwater runoff from municipal areas (SWRCB, 2011a). The primary source in the Central Valley appears to be tailing piles located at abandoned mine sites. Many of these mines are located upstream of reservoirs; therefore, the sediment that includes the heavy metal constituents is generally captured upstream of the dam. Heavy metals appear to cause health concerns in aquatic resources and in humans that consume the fish from these water bodies.”*

Abandoned mines, which contribute heavy metals to area streams, are also found downstream from Shasta and Keswick dams. In addition, natural erosion and soil leaching also contribute to metals loads found in area streams, such as Cottonwood Creek, which make up the bulk of the flow in the Sacramento River during high runoff events during which flows would be diverted to the proposed reservoir. It is not that “heavy metals appear to cause health concerns in aquatic resources and humans,” it is well known that they do.

### **7.2.4 Primary Study Area**

#### **7.2.4.1 Overview and Methodology**

*“DWR began monthly sampling of streams in the Primary Study Area in 1997, including physical parameters, nutrients, minerals, and metals in the water column (DWR, 2012), as well as mercury analysis of sport fish tissues collected from nearby existing reservoirs, including East Park, Stony Gorge, and Black Butte (DWR, 2007a). Routine water quality monitoring by DWR was periodically suspended due to funding limitations during portions of 2008 and 2009, and ended following the January 2010 monitoring run. Sampling results were then compared to Central Valley Basin Plan water quality criteria (CVRWQCB, 2011) (Appendix 7A California State Water Resources Control Board Constituents of Concern of Water Bodies in the Study Area) and USEPA ambient water quality criteria to prevent nuisance algal growth in streams (USEPA, 2001b).”*

DWR does not indicate any data for metals in its Water Data Library until 2006 for the Sacramento River below the Red Bluff Diversion Dam, and 2003 for the Sacramento River at Hamilton City and opposite the Moulton Weir, as well as Stone Corral Creek. Funding for water quality monitoring by DWR was curtailed shortly after the 1997 date indicated in the EIR, after the project manager in the Red Bluff office was informed of potential adverse impacts from metals by the then Chief of the Water Quality and Biology Section. If additional data are available, that data should be made available in the WDL so that reviewers of this EIR can verify claims about lack of water quality issues made in the EIR. However, the data that are in the WDL adequately demonstrate significant adverse water quality issues with the proposed project. Any additional data that has not been shared will just confirm these issues.

Appendix 7A - California State Water Resources Control Board Constituents of Concern of Water Bodies in the Study Area – lists a large number of parameters for which no information is contained in this EIR. For example, chlorpyrifos, diazinon, chlordane, DDT, mercury, PCBs, and dieldrin are constituents of concern from Keswick Dam to the Delta. The EIR should assess how these constituents will impact water quality in the proposed reservoir.

#### **7.2.4.2 East Park and Stony Gorge Reservoirs**

*“East Park and Stony Gorge reservoirs were sampled during the summer of 2000 to evaluate the extent of mercury contamination in fish because these reservoirs are representative of conditions that could be expected in the proposed Sites Reservoir. DWR analyses of total recoverable mercury indicate that levels in samples collected near the bottom of the water column at Stony Gorge and Black Butte reservoirs, exceeded the California Toxics Rule for protection of human health.*

*Fish tissue samples were collected by DWR from East Park and Stony Gorge reservoirs during 2000 to 2001. Neither catfish nor bass composites collected from East Park Reservoir exceeded the OEHHA screening value or USEPA criterion, although mercury levels in the small-sized bass approached these values, and a very large channel catfish that was analyzed individually contained tissue mercury at over twice the level of the screening value and criterion limits. Mercury concentrations in tissues of channel catfish collected from Stony Gorge Reservoir contained levels less than the screening value and criterion (DWR, 2007a).”*

Mercury sampling in fish from East Park and Stony Gorge reservoirs was conducted to contribute to the knowledge of mercury contamination in a number of northern California lakes and reservoirs, not simply because these reservoirs are representative of conditions that could be expected in the proposed Sites Reservoir, though they well might. As noted, the bass from East Park Reservoir that were used for the composite analysis were small in size (about one foot long), yet approached the screening value and criterion. Larger fish can be expected to exceed these values since mercury is accumulated and magnified in fish tissues. The large catfish which contained mercury at over twice the screening value and criterion is probably representative of mercury concentrations that can be found in this species.

The EIR fails to mention that mercury contamination exceeded the screening value and criterion in a relatively small largemouth bass collected from Stony Gorge Reservoir. Though the catfish analyzed from Stony Gorge Reservoir did not exceed the screening value and criterion, the cited report states that “larger channel catfish from Stony Gorge Reservoir, therefore, may be expected to contain mercury concentrations that exceed the screening value and criterion.”

Since mercury contamination in excess of criteria occurs in lakes that the EIR states are representative of conditions that could be expected in the proposed Sites Reservoir, the EIR should discuss the probability of mercury contamination in the proposed reservoir and ramifications to recreational fishing and wildlife that would consume fish from the reservoir.

### **7.2.4.3 Salt Lake**

*“Saline water has been observed to seep from underground salt springs in the vicinity of the Salt Lake fault along the slopes above the valley and along the valley floor within the proposed inundation area of Sites Reservoir. These areas are generally located in the Funks Creek watershed. The water from the underground springs accumulates along the trough of the valley and forms Salt Lake (USGS, 1915). The size of Salt Lake and adjacent seasonal brackish wetlands varies with time. The wetted area appears to vary from 0 to 30 acres. The deeper water appears to be approximately 15 acres based on observations in 2017. The depth of the water has not been monitored.*

*Salt Lake was only sampled on a few occasions from 1997 to 1998. In August 1997, the Salt Lake was dry. In September 1997, the springs were bubbling and the EC was 194,100 micromhos per centimeter ( $\mu\text{mhos/cm}$ ) as compared to 3,490  $\mu\text{mhos/cm}$  for the nearby Stone Corral Creek. In January 1998, there was less than 1 cfs of flow from the springs, and the EC was 7,200  $\mu\text{mhos/cm}$  as compared to 540  $\mu\text{mhos/cm}$  for the nearby Stone Corral Creek. From these samples, it was found that waters from this location are extremely high in minerals. The EC value on one occasion reached 194,100 micromhos per centimeter. The TDS measurement at this time was 258,000 mg/L. EC, TDS, sodium, and boron exceeded all Central Valley Basin Plan criteria. A few metals also were noted at very high concentrations (aluminum, iron, and manganese) and exceeded all criteria, and a few others exceeded some criteria (arsenic, copper, lead, and nickel). Levels of ammonia and orthophosphate also were noted at high levels and exceeded criteria. Temperatures from this site were variable, and probably depend on seasonal conditions. Concentrations present in water from this site likely depend on the season and flow.”*

Though the EIR states that water quality data used in the analyses are available in the WDL, data for Salt Lake could not be found. However, the EIR states that several metals (aluminum, iron, and manganese) were found in concentrations that exceed all Basin Plan criteria, while others (arsenic, copper, lead, and nickel) exceed some criteria. These metals from the springs feeding Salt Lake will add to the metals load in the proposed reservoir.

### **7.2.4.4 Funks Creek**

*“Funks Creek originates at approximately 850 feet elevation in the foothills west of Antelope Valley. The banks of this intermittent stream are heavily eroded and the gravel bed is highly disturbed and compacted by cattle. Along the north end of Antelope Valley, Funks Creek receives underground drainage from Salt Lake. Funks Creek widens as it cuts through Logan Ridge and enters the western side of the Sacramento Valley, although flows are still intermittent. Approximately 1 mile downstream of Logan Ridge, Funks Creek is impounded by Funks Reservoir. This reservoir is fed mainly from waters of the Tehama-Colusa Canal. Downstream of the reservoir, Funks Creek is bordered by agricultural lands, and much of this reach is channelized before emptying into Stone Corral Creek. This portion of Funks Creek likely has some flow year round, due to leakage from the dam at Funks Reservoir.*

*DWR observed aluminum, arsenic, copper, iron, manganese, mercury, nickel, and phosphorus in Funks Creek at the Glenn-Colusa Irrigation District (GCID) Main Canal station during intermittent water quality sampling. The concentrations appeared to be higher during and immediately following storm events.”*

As with Salt Lake, data for Funks Creek could not be found in the WDL. The data used in the analyses in the EIR must be made available for review. It is likely that the reported metals exceed various criteria, as with Salt Lake, and thus add to the metals load in the proposed reservoir.

#### **7.2.4.5 Stone Corral Creek**

*“Stone Corral Creek originates at approximately 700 feet elevation in the foothills west of Antelope Valley. As the intermittent stream flows into the grasslands of Antelope Valley, the channel is narrow and the banks eroded. The much larger Antelope Creek flows into Stone Corral Creek from the south near the town of Sites. Stone Corral Creek flows through the gap in the foothills and into the western Sacramento Valley.*

*DWR observed aluminum, arsenic, copper, iron, manganese, nickel, and phosphorus during intermittent sampling in Stone Corral Creek near Sites station during intermittent water quality sampling. The concentrations appeared to be higher during and immediately following storm events.”*

Data for Stone Corral Creek are available in the WDL. These data show that not only are high concentrations of aluminum, arsenic, copper, iron, manganese, and nickel present, as reported in the EIR, but also cadmium, chromium, lead, mercury, selenium, silver, and zinc, as well as boron (Table 5). The EIR does not disclose the fact that, not only are the concentrations higher during and immediately following storm events, the resulting metals concentration in Stone Corral Creek exceed a large number of criteria and standards including those to protect drinking water, public health, freshwater aquatic life, and agricultural uses. These metals will also contribute to the metals load in the proposed reservoir.

The metals concentrations found in Stone Corral Creek, Salt Lake, and Funks Creek are a result of leaching from the soils through which these water bodies flow. Inundation of these soils by the proposed reservoir will result in an additional metals load to the reservoir.

#### **7.2.4.6 Tehama-Colusa Canal**

“The intake for the Tehama-Colusa Canal occurs at the southeast end of the City of Red Bluff at River Mile (RM) 243. The intake occurs downstream of the mouth of Red Bank Creek. The Tehama-Colusa Canal is approximately 111 miles long and extends from Red Bluff in Tehama County to downstream of Dunnigan in Yolo County. Funks Reservoir is approximately 66 canal miles downstream of the intake at the Sacramento River.

DWR observed aluminum, arsenic, cadmium, and iron during intermittent sampling in the Tehama-Colusa Canal downstream of the siphon under Stony Creek during intermittent water quality sampling.”

The intake for the Tehama-Colusa Canal is at the Sacramento River below Red Bluff Diversion Dam water quality monitoring station. Therefore, water quality in the Tehama-Colusa Canal will be exactly that found at the Sacramento River below Red Bluff Diversion Dam monitoring station. Data for this monitoring station can be found in the WDL.

This is another example where the EIR is less than forthcoming. Not only are aluminum, arsenic, cadmium, and iron present in water diverted from the river into the canal, but, as discussed earlier, so are chromium, copper, lead, manganese, mercury, nickel, selenium, and zinc (Table 1). The highest concentrations were found during the higher flow months (December through March). As discussed earlier, many of these metals exceed a large number of criteria and standards, including those developed to protect drinking water, public health, freshwater aquatic life, and agricultural uses. Water quality in the proposed reservoir will reflect that in the Sacramento River below the Red Bluff Diversion Dam and other source waters, and exceed many of the criteria developed to protect beneficial uses of the water.

#### **7.2.4.7 Glenn-Colusa Irrigation District Main Canal**

“The intake for the GCID Main Canal is on a side channel off the Sacramento River at RM 205.5, north of the town of Hamilton City. GCID’s Hamilton City pump station, located at the intake, diverts water into the GCID Main Canal from the Sacramento River for distribution within the GCID service area. The canal is an unlined earthen channel that stretches approximately 65 miles from the system diversion point near Hamilton City to its downstream southern terminus at the CBD near Williams, in Colusa County.

DWR observed aluminum, arsenic, cadmium, copper, iron, mercury, manganese, and phosphorus during intermittent sampling in the GCID Main Canal intake during intermittent water quality sampling.”

The intake for the GCID Main Canal is slightly upstream from the Sacramento River at Hamilton City water quality monitoring station. Therefore, water quality in the GCID Main Canal will be similar to that found at the Sacramento River at Hamilton City monitoring station. Data for this monitoring station can be found in the WDL.

Not only are aluminum, arsenic, cadmium, copper, iron, manganese, and mercury present in the Sacramento River in the vicinity of the diversion into the GCID Main Canal, but so are chromium, lead, nickel, selenium, silver, and zinc (Table 3). Aluminum, arsenic, cadmium, iron, lead, manganese, mercury, and nickel are present in concentrations that exceed various criteria and standards. The highest concentrations are generally found during the higher flow months of December through March, when the proposed project may be diverting water from this area of the Sacramento River.

#### **7.2.4.9 Sacramento River Opposite Moulton Weir**

*“DWR monitored water quality at the Sacramento River along the western bank opposite Moulton Weir station from 2000 to 2010. The water quality samples included aluminum, arsenic, copper, iron, mercury, manganese, lead, and phosphorus. Total aluminum levels in the Sacramento River at this location frequently exceeded aquatic life criteria during associated high flow conditions in the river, but rarely exceeded drinking water criteria and the agricultural goal. Arsenic levels exceeded human toxicity thresholds in all samples collected, and the criterion for protection of aquatic life for cadmium was occasionally exceeded. Copper levels frequently exceeded hardness-dependent aquatic life protection criteria during high flow conditions in the river, and iron levels frequently exceeded drinking water and aquatic life protection criteria, as well as the agricultural goal during the same river conditions. Dissolved iron levels exceeded the Central Valley Basin Plan level occasionally. Mercury levels approached, but did not exceed, the CTR criterion during the highest flows in the river. Manganese levels*

*occasionally exceeded drinking water standards and the agricultural goal, and lead levels rarely exceeded drinking water criteria. All samples contained total phosphorus at levels at or above the recommended criteria range to prevent nuisance algal growth in streams.”*

Monitored metals also included cadmium, chromium, nickel, selenium, silver, and zinc (Table 4). Contrary to the statement in the EIR, aluminum concentrations frequently exceed drinking water criteria and on several occasions the agricultural goal during the high flow months of December through March. With reported concentrations up to 38 ug/L, mercury not only approached but greatly exceeded the California Toxics Rule (CTR) criterion (0.05 ug/L) for sources of drinking water as well as the National Recommended Water Quality for freshwater aquatic life continuous concentration (0.77 ug/L) and maximum concentration (1.8 ug/L). Reported lead concentrations frequently exceed the California Public Health Goal of 0.02 ug/L, and had a median value of 0.058 ug/L. Reported nickel concentrations also exceed the California Public Health Goal.

## ***Environmental Impacts/Environmental Consequences***

### ***7.3.1 Section 303 Evaluation Criteria and Significance Thresholds***

*“Significance criteria represent the thresholds that were used to identify whether an impact would be potentially significant. Appendix G of the CEQA Guidelines suggests the following evaluation criteria for water quality:*

*Would the Project:*

- Violate any water quality standards or waste discharge requirements?*
- Create or contribute runoff water that would exceed the capacity of existing or planned stormwater*

*drainage systems or provide substantial additional sources of polluted runoff?*

- Otherwise substantially degrade water quality?*

*The evaluation criteria used for this impact analysis represent a combination of the Appendix G criteria and professional judgment that considers current regulations, standards, and/or consultation with agencies, knowledge of the area, and the context and intensity of the environmental effects, as required pursuant to NEPA. For the purposes of this analysis, an alternative would result in a potentially significant impact if it would cause the following:*

*\* A violation of any water quality standard or waste discharge requirement, or otherwise substantially degrade water quality*

*If a water quality constituent declines under the action alternatives as compared to the Existing Conditions/No Project/No Action Condition, the changes are not considered to be adverse.*

## Qualitative Analysis of Constituents

The qualitative analysis of changes in other constituents (e.g., mercury, selenium, nutrients) was based upon an analysis of potential changes in loadings from sources of the constituent and related changes in flows that would occur from implementation of the Project as compared to the Existing Conditions/No Project/No Action Condition. For example, the qualitative analysis of changes in mercury is based upon changes in flow patterns from the major sources of mercury in the Sacramento River watershed (e.g., tributaries to the Sacramento River).”

What the heck does this last paragraph mean? It makes absolutely no sense. The analysis of potential impacts should be based on an assessment of the expected water quality in the proposed reservoir, whether that water quality exceeds any criteria or standards, and the adverse effects that would occur if criteria or standards are exceeded, both within the reservoir and in downstream areas subject to releases from the reservoir.

### 7.3.4 Section 303 Impacts Associated with Alternative A

#### Shasta Lake and Sacramento River from Shasta Lake and Keswick Reservoir to Freeport

##### *Impact SW Qual-1: A Violation of Any Water Quality Standard or Waste Discharge Requirement, or Otherwise Substantially Degrade Surface Water Quality*

##### *Mercury and Other Heavy Metals*

“As described in Section 7.2, the sources of mercury and other heavy metals in Shasta Lake are located upstream of the lake and accumulate within Shasta Lake. Mercury in the Sacramento River downstream of Keswick Reservoir is generated along the tributaries to the Sacramento River. The generation rate and the accumulation rates of mercury and other heavy metals in Shasta Lake or along the Sacramento River would not be affected by implementation of Alternative A because there would be no new facilities constructed upstream of Shasta Lake or along the tributaries. Operations of Shasta Lake under Alternative A, as reflected by end-of-month Shasta Lake storage, would be similar to conditions under the Existing Conditions/No Project/No Action Condition, as described in Chapter 6 Surface Water Resources.”

Accumulation of mercury would indeed be affected by Alternative A (and all the other alternatives) since water from the Sacramento River, containing mercury concentrations in excess of various criteria, would be diverted into the proposed reservoir. Releases from the reservoir could adversely affect downstream resources and beneficial uses due to the mercury contained in the reservoir. In addition, fisheries, wildlife, and recreation that utilize the reservoir could be adversely affected from mercury accumulation in the reservoir food web.

##### *Summary*

“Concentrations of mercury, other heavy metals, and salinity would be similar in the Sacramento River under Alternative A as compared to the Existing Conditions/No Project/No Action Condition; therefore, there would be **no impact** related to these constituents.”

Again, there are potential very significant adverse impacts associated with diverting water from the Sacramento River during higher flow periods to the proposed reservoir. The Sacramento River contains concentrations of a large number of metals, including aluminum, arsenic, cadmium, chromium, iron, lead, manganese, and mercury, that significantly exceed various criteria and standards designed to protect beneficial uses. Water in the reservoir will reflect that of the water diverted from the Sacramento River, and will also exceed a number of criteria developed to protect beneficial uses. The metals may adversely affect aquatic resources in the reservoir and terrestrial resources that may utilize the reservoir (such as fish-eating birds), as well as reservoir recreation.

The metals in releases from the reservoir may adversely affect downstream resources, including drinking water supply, agricultural supply, wildlife, and fisheries, and may violate the SWRCB antidegradation policy. These are definite “impacts related to these constituents,” contrary to what is stated above in this EIR. All the alternatives suffer from the exact same significant adverse impacts due to metals in the source waters.

#### **7.4 Mitigation Measures**

“Because no potentially significant direct water quality impacts were identified, no mitigation is required or recommended.”

The EIR failed to identify any impacts, though significant potential adverse impacts are painfully obvious. The EIR completely ignores any assessment of the proposed project – Sites Reservoir, as well as any assessment of the adverse impacts the reservoir may pose to beneficial uses within the reservoir (i.e., fisheries, wildlife, recreation) and those adverse impacts attributable to releases from the reservoir (i.e., drinking water supply, agricultural water supply, fisheries, wildlife, recreation). As shown throughout this discussion, a number of metals significantly exceed water quality criteria and standards in the water sources to the proposed reservoir. The EIR completely ignores potential chemical contaminants (such as chlorpyrifos, diazinon, chlordane, DDT, mercury, PCBs, and dieldrin). Water quality in the reservoir will reflect that of the source waters. Therefore, the reservoir will contain a number of metals, including aluminum, arsenic, cadmium, chromium, iron, lead, manganese, and mercury, and possibly other chemical contaminants that exceed a number of water quality criteria designed to protect beneficial uses. Both water resources within the reservoir and downstream resources that receive reservoir releases may be adversely affected by the metals and chemical contaminants. The EIR also fails to address the physical properties that will exist in the reservoir (such as thermal stratification and hypolimnetic anoxia), and how they will affect both reservoir and downstream resources. The EIR needs to address how these significant adverse impacts are going to be mitigated.

#### References

SWRCB 2011. State Water Resources Control Board. A Compilation of Water Quality Goals, 16<sup>th</sup> Edition. April 2011.



Table 1. Sacramento River below Red Bluff Diversion Dam, Part 1 of 2

Station Name	Sample Date	Dissolved Aluminum µg/L	Total Aluminum µg/L	Dissolved Arsenic µg/L	Total Arsenic µg/L	Dissolved Cadmium µg/L	Total Cadmium µg/L	Dissolved Chromium µg/L	Total Chromium µg/L	Dissolved Copper µg/L	Total Copper µg/L	Dissolved Iron µg/L	Total Iron µg/L
SACRAMENTO R BL RED BLUFF DIV DM	2/21/06 10:45	131	154	0.702	0.789	0.013	0.016	0.97	0.98	1.08	1.21	76	162
SACRAMENTO R BL RED BLUFF DIV DM	3/1/06 11:00	1459	2240	0.857	1.06	0.017	0.055	2.75	6.1	2.59	6.09	878	2854
SACRAMENTO R BL RED BLUFF DIV DM	4/18/06 9:25	462	729	0.874	0.951	<0.1	<0.1	0.95	1.57	2.36	3.42	277	677
SACRAMENTO R BL RED BLUFF DIV DM	5/16/06 6:45	131	206	0.915	0.959	<0.1	<0.1	0.55	0.58	1.45	1.84	86.8	181
SACRAMENTO R BL RED BLUFF DIV DM	6/26/06 10:05	220	399	1.04	1.09	<0.1	<0.1	0.67	0.98	1.12	1.6	66.2	233
SACRAMENTO R BL RED BLUFF DIV DM	7/25/06 8:20	318	794	1.03	1.1	<0.1	<0.1	1	1.31	1.31	2.18	82	323
SACRAMENTO R BL RED BLUFF DIV DM	8/21/06 13:30	194	278	0.884	0.993	<0.1	<0.1	1.1	1.37	1.07	1.55	132	259
SACRAMENTO R BL RED BLUFF DIV DM	9/21/06 7:15	320	730	0.9	0.933	<0.1	<0.1	0.65	1.01	1.03	1.67	85.3	300
SACRAMENTO R BL RED BLUFF DIV DM	10/25/06 12:30	84.1	214	0.917	0.964	<0.1	<0.1	0.61	0.89	1.28	1.6	51	218
SACRAMENTO R BL RED BLUFF DIV DM	12/13/06 9:20	1238	2010	0.977	1.22	<0.1	<0.1	0.61	1.56	2.3	3.91	235	621
SACRAMENTO R BL RED BLUFF DIV DM	1/10/07 12:25	41.7	91.4	1.42	1.5	<0.1	<0.1	0.55	0.59	0.92	1.01	34.9	54.3
SACRAMENTO R BL RED BLUFF DIV DM	2/26/07 10:45	212	322	0.929	0.987	<0.1	<0.1	1.2	1.61	2.55	2.8	293	376
SACRAMENTO R BL RED BLUFF DIV DM	3/21/07 10:30	9.58	51	1.41	1.46	<0.1	<0.1	0.44	0.59	1.47	1.74	21.5	85.5
SACRAMENTO R BL RED BLUFF DIV DM	4/17/07 10:30	12.3	41	1.53	1.62	<0.1	<0.1	0.45	0.58	1.71	1.93	13.4	51.1
SACRAMENTO R BL RED BLUFF DIV DM	5/29/07 9:45	5.52	15.9	1.68	1.87	<0.1	<0.1	0.53	0.59	1.27	1.53	4.2	32.2
SACRAMENTO R BL RED BLUFF DIV DM	6/26/07 9:45	5.47	56.6	1.59	1.72	<0.1	<0.1	0.55	0.74	1.1	1.41	12.3	75.5
SACRAMENTO R BL RED BLUFF DIV DM	7/18/07 10:10	6.45	50.2	1.63	1.73	<0.1	<0.1	0.5	0.62	0.88	1.25	4.5	73.4
SACRAMENTO R BL RED BLUFF DIV DM	8/27/07 12:10	14.2	26.6	1.55	1.75	<0.1	<0.1	0.47	0.6	0.75	0.97	8.8	33.8
SACRAMENTO R BL RED BLUFF DIV DM	9/12/07 10:40	2.04	24	1.4	1.59	<0.1	<0.1	0.42	0.55	0.67	0.82	3.8	24.6
SACRAMENTO R BL RED BLUFF DIV DM	10/30/07 10:40	5.66	34.5	1.5	1.64	<0.1	<0.1	0.42	0.46	0.99	1.14	12	73
SACRAMENTO R BL RED BLUFF DIV DM	11/26/07 13:40	1.11	18	1.96	2.01	<0.1	<0.1	0.5	0.52	0.66	0.92	5.5	51.2
SACRAMENTO R BL RED BLUFF DIV DM	1/22/08 8:40	6.82	284	1.5	1.71	<0.1	<0.1	0.53	1.15	1.45	2.04	9.5	259
SACRAMENTO R BL RED BLUFF DIV DM	2/26/08 10:40	14.2	846	0.799	0.932	<0.1	<0.1	0.33	2.49	1.97	3.88	24.6	790
SACRAMENTO R BL RED BLUFF DIV DM	3/25/08 7:25	2.25	35	1.31	1.37	<0.1	<0.1	0.42	0.55	1.7	2.09	7.8	62
SACRAMENTO R BL RED BLUFF DIV DM	4/22/08 13:55	4.86	89.3	1.58	1.63	<0.1	<0.1	0.43	0.51	1.63	1.84	9.1	94.6
SACRAMENTO R BL RED BLUFF DIV DM	7/23/08 13:50	2.29	84.5	1.5	1.55	<0.1	<0.1	0.44	0.56	0.9	1.14	7.1	72.4
SACRAMENTO R BL RED BLUFF DIV DM	4/21/09 13:20	6.61	107	1.73	2.06	<0.1	<0.1	0.39	0.65	2.53	2.72	21.6	144
SACRAMENTO R BL RED BLUFF DIV DM	5/27/09 14:30	5.07	89.8	1.27	1.32	<0.1	<0.1	0.39	0.54	1.82	1.95	7.4	87.8
SACRAMENTO R BL RED BLUFF DIV DM	6/24/09 14:00	12.5	66.4	1.26	1.28	<0.1	<0.1	0.39	0.5	1.68	1.72	8.9	72.1
SACRAMENTO R BL RED BLUFF DIV DM	7/27/09 14:07	9.61	168	1.49	1.56	<0.1	<0.1	0.49	0.79	1.11	1.51	11.2	130
SACRAMENTO R BL RED BLUFF DIV DM	8/25/09 9:55	2.86	80.4	1.18	1.25	<0.1	<0.1	0.39	0.54	0.91	1.08	5.8	71.9
SACRAMENTO R BL RED BLUFF DIV DM	9/23/09 8:50	4.04	72.6	1.27	1.33	<0.1	<0.1	0.38	0.48	1.04	1.09	9.6	79.8
SACRAMENTO R BL RED BLUFF DIV DM	10/26/09 13:15	7.2	87.1	1.44	1.52	<0.1	<0.1	0.44	0.6	1.26	1.49	16.1	84.8
	Maximum	1459	2240	1.96	2.06	0.017	0.055	2.75	6.1	2.59	6.09	878	2854
	Median	9.61	89.8	1.31	1.37	0.015	0.0355	0.5	0.6	1.27	1.6	13.4	87.8
	Minimum	1.11	15.9	0.702	0.789	0.013	0.016	0.33	0.46	0.66	0.82	3.8	24.6
SWRCB Basin Plan - Drinking Water Standards -Primary MCL			1000		10								
SWRCB Basin Plan - Drinking Water Standards -Secondary MCL			200										300
Cal EPA/OEHHA - California Public Health Goal					0.004				0.02				
USEPA Secondary MCL			50										
Cal EPA - One in a million incremental cancer risk estimate for drinking water					0.023		0.0023		0.07				
USEPA Health Advisory for drinking water					0.02								
California Proposition 65 Safe Harbor Level - Max. Allowable dose level for reproductive toxicity					0.05								
Agriculture Water Quality Goals - Taste and odor threshold													
National Recommended WQ Criteria - Taste and Odor or Welfare													300
National Recommended WQ Criteria - Human Health and Welfare protection - water and fish consumption					0.018								
National Recommended WQ Criteria - Freshwater Aquatic Life Continuous			87										1000
National Recommended WQ Criteria - Freshwater Aquatic Life Maximum			750										

Table 1. Sacramento River below Red Bluff Diversion Dam, Part 2 of 2

Station Name	Sample Date	Dissolved Lead µg/L	Total Lead µg/L	Dissolved Manganese µg/L	Total Manganese µg/L	Total Mercury ng/L	Dissolved Nickel µg/L	Total Nickel µg/L	Dissolved Selenium µg/L	Total Selenium µg/L	Dissolved Zinc µg/L	Total Zinc µg/L
SACRAMENTO R BL RED BLUFF DIV DM	2/21/06 10:45	<0.045	0.049	2.37	5.71	N/A	1.53	1.62	<0.149	0.15	1.45	1.89
SACRAMENTO R BL RED BLUFF DIV DM	3/1/06 11:00	0.274	1.1	13.5	78.9	N/A	2.84	8.57	<0.149	0.16	4.49	13.2
SACRAMENTO R BL RED BLUFF DIV DM	4/18/06 9:25	0.086	0.271	6.94	19.6	N/A	1.69	2.84	0.24	0.31	2.95	5.81
SACRAMENTO R BL RED BLUFF DIV DM	5/16/06 6:45	<0.04	0.075	1.64	7.63	N/A	1.14	1.34	<0.2	<0.2	0.49	1.78
SACRAMENTO R BL RED BLUFF DIV DM	6/26/06 10:05	<0.04	0.092	1.1	7.92	N/A	1.6	2.1	<0.2	<0.2	0.72	2.31
SACRAMENTO R BL RED BLUFF DIV DM	7/25/06 8:20	<0.04	0.15	1.49	11.7	1.7	1.8	3.01	<0.2	0.26	1.02	4.39
SACRAMENTO R BL RED BLUFF DIV DM	8/21/06 13:30	<0.04	0.102	1.65	5.98	0.89	1.84	2.55	<0.2	<0.2	1.51	3.22
SACRAMENTO R BL RED BLUFF DIV DM	9/21/06 7:15	<0.04	0.102	1.88	12.8	1.4	1.88	2.85	<0.2	0.24	1.18	5.92
SACRAMENTO R BL RED BLUFF DIV DM	10/25/06 12:30	<0.04	0.1	0.91	6.93	0.58	1.78	2.19	<0.2	0.26	0.69	4.16
SACRAMENTO R BL RED BLUFF DIV DM	12/13/06 9:20	0.103	0.546	3.08	38.6	0.84	1.3	2.32	<0.2	0.24	2.07	9.17
SACRAMENTO R BL RED BLUFF DIV DM	1/10/07 12:25	<0.04	<0.04	1.37	3.13	0.59	0.97	1.02	<0.2	<0.2	0.71	2.82
SACRAMENTO R BL RED BLUFF DIV DM	2/26/07 10:45	0.149	0.234	6.41	10.2	2.6	1.14	1.49	0.2	0.28	3.09	5.68
SACRAMENTO R BL RED BLUFF DIV DM	3/21/07 10:30	<0.04	0.04	1.27	4.8	0.9	0.84	0.97	<0.2	0.2	0.38	3.58
SACRAMENTO R BL RED BLUFF DIV DM	4/17/07 10:30	<0.04	<0.04	1.71	5.08	1.2	0.57	0.72	<0.2	<0.2	0.48	3.46
SACRAMENTO R BL RED BLUFF DIV DM	5/29/07 9:45	<0.04	<0.04	0.39	2.95	N/A	0.65	0.76	<0.2	0.23	0.31	3.01
SACRAMENTO R BL RED BLUFF DIV DM	6/26/07 9:45	<0.04	0.058	3.41	7.57	0.74	0.97	1.22	<0.2	0.25	1.19	4.35
SACRAMENTO R BL RED BLUFF DIV DM	7/18/07 10:10	<0.04	<0.04	0.2	4.47	0.98	0.76	1.08	<0.2	<0.2	0.31	3.37
SACRAMENTO R BL RED BLUFF DIV DM	8/27/07 12:10	<0.04	<0.04	0.33	3.8	N/A	1.25	1.4	<0.2	0.23	2	2.22
SACRAMENTO R BL RED BLUFF DIV DM	9/12/07 10:40	<0.04	0.058	0.18	3	0.58	0.89	1	<0.2	<0.2	0.5	2.34
SACRAMENTO R BL RED BLUFF DIV DM	10/30/07 10:40	<0.04	0.052	0.19	4.66	0.48	0.92	1.2	<0.2	<0.2	0.71	3.12
SACRAMENTO R BL RED BLUFF DIV DM	11/26/07 13:40	<0.04	0.078	0.32	4.71	1.2	0.63	0.93	<0.2	<0.2	0.34	2.59
SACRAMENTO R BL RED BLUFF DIV DM	1/22/08 8:40	<0.04	0.13	0.73	12.7	N/A	0.91	1.08	<0.2	<0.2	1.33	4.99
SACRAMENTO R BL RED BLUFF DIV DM	2/26/08 10:40	<0.04	0.388	0.68	23.4	N/A	1.58	3	<0.2	0.21	0.97	6.85
SACRAMENTO R BL RED BLUFF DIV DM	3/25/08 7:25	<0.04	<0.04	0.36	6.12	N/A	0.71	0.95	<0.2	0.25	0.44	3.11
SACRAMENTO R BL RED BLUFF DIV DM	4/22/08 13:55	<0.04	0.051	1.48	5.43	N/A	0.72	0.88	0.25	0.26	1.11	3.47
SACRAMENTO R BL RED BLUFF DIV DM	7/23/08 13:50	<0.04	<0.04	0.26	4.64	0.65	1.2	1.24	<0.2	<0.2	0.51	2.87
SACRAMENTO R BL RED BLUFF DIV DM	4/21/09 13:20	<0.04	0.073	0.57	5.35	N/A	0.8	0.88	<0.2	<0.2	1.07	4.06
SACRAMENTO R BL RED BLUFF DIV DM	5/27/09 14:30	<0.04	<0.04	0.43	2.32	N/A	0.82	0.96	<0.2	<0.2	0.48	2.28
SACRAMENTO R BL RED BLUFF DIV DM	6/24/09 14:00	<0.04	<0.04	0.3	3.26	N/A	0.91	1.05	0.23	0.27	1.25	3.27
SACRAMENTO R BL RED BLUFF DIV DM	7/27/09 14:07	<0.04	0.063	1.86	6.71	N/A	1.17	1.24	<0.2	<0.2	1.32	4.09
SACRAMENTO R BL RED BLUFF DIV DM	8/25/09 9:55	<0.04	<0.04	0.35	4.54	N/A	1.13	1.21	<0.2	<0.2	0.81	2.67
SACRAMENTO R BL RED BLUFF DIV DM	9/23/09 8:50	<0.04	<0.04	0.32	4.77	N/A	1.01	1.16	<0.2	<0.2	0.63	2.79
SACRAMENTO R BL RED BLUFF DIV DM	10/26/09 13:15	<0.04	0.076	2.55	7.5	N/A	0.97	1.03	<0.2	<0.2	0.94	3.12
	Maximum	0.274	1.1	13.5	78.9	2.6	2.84	8.57	0.25	0.31	4.49	13.2
	Median	0.126	0.085	1.1	5.71	0.89	1.01	1.21	0.235	0.245	0.94	3.27
	Minimum	0.086	0.04	0.18	2.32	0.43	0.57	0.72	0.2	0.15	0.31	1.78
SWRCB Basin Plan - Drinking Water Standards -Primary MCL												
SWRCB Basin Plan - Drinking Water Standards -Secondary MCL					50							
Cal EPA/OEHHA - California Public Health Goal		0.2										
USEPA Secondary MCL												
Cal EPA - One in a million incremental cancer risk estimate for drinking water												
USEPA Health Advisory for drinking water												
California Proposition 65 Safe Harbor Level - Max. Allowable dose level for		0.25										
Agriculture Water Quality Goals - Taste and odor threshold												
National Recommended WQ Criteria - Taste and Odor or Welfare					50							
National Recommended WQ Criteria - Human Health and Welfare protection -												
National Recommended WQ Criteria - Freshwater Aquatic Life Continuous						0.77						
National Recommended WQ Criteria - Freshwater Aquatic Life Maximum						1.4						

Table 2. Cottonwood Creek near Cottonwood, Part 1 of 2

Station Name	Sample Date	Dissolved Aluminum µg/L	Total Aluminum µg/L	Dissolved Arsenic µg/L	Total Arsenic µg/L	Dissolved Cadmium µg/L	Total Cadmium µg/L	Dissolved Chromium µg/L	Total Chromium µg/L	Dissolved Copper µg/L	Total Copper µg/L	Dissolved Iron µg/L	Total Iron µg/L
COTTONWOOD C NR COTTONWOOD	10/5/04 11:30	5.21	10.5	0.662	0.668	<0.011	<0.008	0.65	0.68	0.47	0.58	10.2	39
COTTONWOOD C NR COTTONWOOD	11/8/04 11:20	3.98	6.42	0.684	0.723	<0.008	<0.007	1.51	1.75	0.48	0.72	3.6	26
COTTONWOOD C NR COTTONWOOD	12/7/04 10:40	7.02	31.3	0.524	0.612	<0.012	0.081	2.04	2.33	0.66	0.7	<4.5	42
COTTONWOOD C NR COTTONWOOD	1/10/05 7:35	208	448	0.517	0.549	<0.011	<0.007	1.73	1.9	1.29	1.67	137	522
COTTONWOOD C NR COTTONWOOD	2/2/05 13:00	87.1	157	0.396	0.417	<0.011	<0.066	1.05	1.14	0.63	0.85	57.1	218
COTTONWOOD C NR COTTONWOOD	3/10/05 13:50	34.7	95.6	0.46	0.468	<0.033	<0.011	1.6	1.63	0.5	0.67	13.7	128
COTTONWOOD C NR COTTONWOOD	4/19/05 8:10	40.2	88	0.413	0.484	<0.022	<0.009	1.02	1.52	0.42	0.59	29.3	114
COTTONWOOD C NR COTTONWOOD	5/13/05 11:20	1358	14345	0.863	3.04	<0.058	0.085	2.94	36.5	4.43	39.2	963	23594
COTTONWOOD C NR COTTONWOOD	6/28/05 7:30	63.9	86.1	0.455	0.465	<0.009	<0.012	1.7	1.14	0.42	0.46	23.8	62.6
COTTONWOOD C NR COTTONWOOD	7/26/05 6:45	1.55	7.51	0.682	0.72	<0.011	<0.004	0.47	0.78	0.48	0.52	<1.51	8.6
COTTONWOOD C NR COTTONWOOD	8/22/05 11:45	2.65	32.9	0.657	0.691	<0.009	<0.009	1.7	1.98	0.5	0.54	<4.16	72.4
COTTONWOOD C NR COTTONWOOD	9/26/05 11:20	10.2	152	0.779	0.795	0.003	0.016	1.03	1.1	1.03	1.28	20.2	294
COTTONWOOD C NR COTTONWOOD	10/24/05 8:30	12.9	47.2	0.705	0.708	<0.009	<0.009	0.9	0.99	0.57	0.69	17.8	83.7
COTTONWOOD C NR COTTONWOOD	11/14/05 9:00	5.42	11.9	0.537	0.579	<0.009	<0.009	0.9	0.91	0.6	0.62	9	26.2
COTTONWOOD C NR COTTONWOOD	12/15/05 9:15	4.38	10.2	0.343	0.434	<0.005	0.007	1.04	1.24	0.41	0.41	<1.51	17.2
COTTONWOOD C NR COTTONWOOD	1/24/06 9:10	202	380	0.42	0.46	0.009	0.015	1.71	2.26	0.75	1.22	123	512
COTTONWOOD C NR COTTONWOOD	3/1/06 9:15	2533	3739	0.889	1.16	0.009	0.023	8.2	15.7	3.22	7.63	1760	5793
COTTONWOOD C NR COTTONWOOD	4/24/06 10:03	151	1225	0.394	0.569	<0.1	<0.1	1.11	4.58	0.6	2.63	122	1174
COTTONWOOD C NR COTTONWOOD	8/16/06 11:00	1.91	20.8	0.703	0.806	<0.1	<0.1	0.33	0.35	0.73	0.84	7.2	29.5
COTTONWOOD C NR COTTONWOOD	11/14/06 9:05	24.8	75.7	0.467	0.594	<0.1	<0.1	0.54	0.68	0.51	0.61	37.4	96.2
COTTONWOOD C NR COTTONWOOD	12/6/06 13:20	4.8	6.62	0.438	0.539	<0.1	<0.1	0.45	1.14	0.5	0.54	6.1	11.7
COTTONWOOD C NR COTTONWOOD	2/20/07 8:45	47.5	52.3	0.3	0.344	<0.1	<0.1	1.38	1.91	0.57	0.62	35.2	50.4
	Maximum	2533	14345	0.889	3.04	0.009	0.085	8.2	36.5	4.43	39.2	1760	23594
	Mean	18.85	64	0.5205	0.5865	0.009	0.0195	1.08	1.38	0.57	0.68	26.55	78.05
	Minimum	1.55	6.42	0.3	0.344	0.003	0.007	0.33	0.35	0.41	0.41	3.6	8.6
SWRCB Basin Plan - Drinking Water Standards -Primary MCL		1000											
SWRCB Basin Plan - Drinking Water Standards -Secondary MCL		200										300	
Cal EPA/OEHHA - California Public Health Goal		600				0.04		0.02					
USEPA Secondary MCL													
Cal EPA - One in a million incremental cancer risk estimate for drinking water				0.023		0.0023		0.07					
USEPA Health Advisory for drinking water				0.02									
California Proposition 65 Safe Harbor Level - Max. Allowable dose level for reproductive toxicity				0.05									
National Academy of Sciences Health Advisory		5000											
Agriculture Water Quality Goals - Taste and odor threshold		5000											5000
National Recommended WQ Criteria - Taste and Odor or Welfare													300
National Recommended WQ Criteria - Human Health and Welfare protection - water and fish consumption		87		0.018									
National Recommended WQ Criteria - Freshwater Aquatic Life		750											1000
National Recommended WQ Criteria - Freshwater Aquatic Life													

Table 2. Cottonwood Creek near Cottonwood, Part 2 of 2

Station Name	Sample Date	Dissolved Lead µg/L	Total Lead µg/L	Dissolved Manganese µg/L	Total Manganese µg/L	Total Mercury ng/L	Dissolved Nickel µg/L	Total Nickel µg/L	Dissolved Selenium µg/L	Total Selenium µg/L	Dissolved Silver µg/L	Total Silver µg/L	Dissolved Zinc µg/L	Total Zinc µg/L
COTTONWOOD C NR COTTONWOOD	10/5/04 11:30	0.008	<0.017	2.58	11.3	N/A	1.34	1.34	0.18	<0.204	<0.077	<0.054	0.19	0.42
COTTONWOOD C NR COTTONWOOD	11/8/04 11:20	<0.001	0.008	3.06	4.36	N/A	0.86	1.53	0.33	0.35	<0.006	<0.063	0.05	0.09
COTTONWOOD C NR COTTONWOOD	12/7/04 10:40	0.012	0.028	0.46	4.09	N/A	1.07	1.2	<0.163	0.28	<0.011	<0.04	0.31	0.65
COTTONWOOD C NR COTTONWOOD	1/10/05 7:35	0.048	0.166	1.79	12.6	N/A	1.59	2.61	0.74	0.81	<0.003	0.006	0.55	1.58
COTTONWOOD C NR COTTONWOOD	2/2/05 13:00	0.017	0.063	2.87	7.91	N/A	1.41	1.93	<0.222	0.18	<0.001	<0.002	0.22	0.73
COTTONWOOD C NR COTTONWOOD	3/10/05 13:50	0.008	0.044	0.79	4.71	N/A	1.28	1.64	<0.245	0.32	<0.001	<0.036	0.16	0.44
COTTONWOOD C NR COTTONWOOD	4/19/05 8:10	0.015	0.034	1.51	5.07	N/A	0.98	1.47	0.31	0.44	<0.003	<0.005	0.2	0.53
COTTONWOOD C NR COTTONWOOD	5/18/05 11:20	0.475	7.26	8.76	563	N/A	3.38	57.9	<0.399	0.39	0.039	0.101	3.31	72
COTTONWOOD C NR COTTONWOOD	6/28/05 7:30	<0.009	<0.027	3.47	3.93	N/A	0.66	1.16	<0.14	<0.354	<0.002	<0.027	0.14	0.36
COTTONWOOD C NR COTTONWOOD	7/26/05 6:45	<0.019	<0.063	0.32	2.51	N/A	0.43	0.82	<0.145	<0.176	<0.002	<0.04	<0.083	0.15
COTTONWOOD C NR COTTONWOOD	8/22/05 11:45	<0.004	0.024	1.05	13.7	N/A	0.79	1.07	<0.227	<0.227	<0.001	<0.001	0.18	0.56
COTTONWOOD C NR COTTONWOOD	9/26/05 11:20	0.006	0.111	0.76	24.9	N/A	1.31	2.36	0.17	0.19	<0.003	<0.003	0.88	1.97
COTTONWOOD C NR COTTONWOOD	10/24/05 8:30	0.008	0.028	1.93	15.4	N/A	1.18	1.45	0.11	0.19	<0.002	<0.002	0.31	0.48
COTTONWOOD C NR COTTONWOOD	11/14/05 9:00	0.01	0.017	1.78	5.95	N/A	1.37	1.38	<0.186	<0.186	<0.009	<0.009	0.39	0.71
COTTONWOOD C NR COTTONWOOD	12/15/05 9:15	0.006	0.008	0.79	2.59	N/A	1.41	1.48	0.16	0.29	<0.001	<0.001	<0.177	<0.177
COTTONWOOD C NR COTTONWOOD	1/24/06 9:10	0.033	0.146	6.19	16.7	N/A	1.95	3.38	0.23	0.28	<0.005	<0.005	0.43	1.44
COTTONWOOD C NR COTTONWOOD	3/1/06 9:15	0.491	1.53	30.8	138	N/A	7.35	20.9	<0.149	0.15	<0.009	<0.009	3.64	13.6
COTTONWOOD C NR COTTONWOOD	4/24/06 10:03	0.04	0.444	2.06	40.8	N/A	1.51	6.9	0.21	0.32	<0.03	<0.03	0.47	4.32
COTTONWOOD C NR COTTONWOOD	8/16/06 11:00	<0.04	<0.04	1.13	5.41	0.72	1.14	1.32	0.42	0.6	<0.03	<0.03	0.14	0.73
COTTONWOOD C NR COTTONWOOD	11/14/06 9:05	<0.04	<0.04	4.82	10.7	N/A	1.56	1.77	0.56	0.63	<0.03	<0.03	<0.1	1.07
COTTONWOOD C NR COTTONWOOD	12/6/06 13:20	<0.04	<0.04	2.55	4.44	N/A	0.87	1.24	0.33	0.59	<0.03	<0.03	0.79	2.02
COTTONWOOD C NR COTTONWOOD	2/20/07 8:45	<0.04	<0.04	5	5.57	1.2	0.16	1.66	0.35	0.51	<0.03	<0.03	0.18	1.65
	Maximum	0.491	7.26	30.8	563	1.2	7.35	57.9	0.74	0.81	0.039	0.101	3.64	72
	Mean	0.0135	0.044	1.995	6.93	0.96	1.295	1.505	0.31	0.32	0.039	0.0535	0.31	0.73
	Minimum	0.006	0.008	0.32	2.51	0.72	0.16	0.82	0.11	0.15	0.039	0.006	0.05	0.09
SWRCB Basin Plan - Drinking Water Standards -Primary MCL														
SWRCB Basin Plan - Drinking Water Standards -Secondary MCL					50									
Cal EPA/OEHHA - California Public Health Goal		0.2					12							
USEPA Secondary MCL														
Cal EPA - One in a million incremental cancer risk estimate for drinking w		4.1												
USEPA Health Advisory for drinking water					300									
California Proposition 65 Safe Harbor Level - Max.														
Allowable dose level for reproductive toxicity		0.25												
National Academy of Sciences Health Advisory														
Agriculture Water Quality Goals - Taste and odor threshold					200									
National Recommended WQ Criteria - Taste and Odor or Welfare					50									
National Recommended WQ Criteria - Human Health and Welfare														
National Recommended WQ Criteria - Freshwater Aquatic Life							0.77							
National Recommended WQ Criteria - Freshwater Aquatic Life							1.4							

Table 3. Sacramento River at Hamilton City, Part 1 of 2

Station Name	Sample Date	Dissolved Aluminum	Total Aluminum	Dissolved Arsenic	Total Arsenic	Dissolved Cadmium	Total Cadmium	Dissolved Chromium	Total Chromium	Dissolved Copper	Total Copper	Dissolved Iron	Total Iron
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
SACRAMENTO R A HAMILTON CITY	11/25/03 9:10	N/A	12.8	N/A	1.93	N/A	<0.005	N/A	0.61	N/A	1.78	N/A	15.9
SACRAMENTO R A HAMILTON CITY	3/8/04 13:00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.84	N/A	N/A	N/A	172
SACRAMENTO R A HAMILTON CITY	5/20/04 15:00	N/A	110	N/A	1.81	N/A	0.011	N/A	0.84	N/A	N/A	N/A	273
SACRAMENTO R A HAMILTON CITY	8/12/04 10:20	N/A	189	N/A	1.36	N/A	0.016	N/A	0.75	N/A	1.65	N/A	134
SACRAMENTO R A HAMILTON CITY	10/5/04 10:05	14.5	113	1.3	1.32	<0.011	<0.008	0.9	0.98	0.72	1.43	9.6	87.4
SACRAMENTO R A HAMILTON CITY	11/9/04 11:40	23.6	36.1	2.49	2.52	<0.008	<0.007	1	1	0.85	1.77	15.5	7.8
SACRAMENTO R A HAMILTON CITY	12/7/04 10:40	2.54	12.5	2.38	2.54	<0.012	0.034	0.54	0.84	0.55	0.75	<4.5	443
SACRAMENTO R A HAMILTON CITY	1/10/05 12:15	352	413	1.48	1.55	<0.011	<0.007	1.06	1.41	1.98	2.45	225	273
SACRAMENTO R A HAMILTON CITY	2/2/05 7:35	77.5	163	1.42	1.51	<0.011	<0.066	1.67	1.88	1.53	1.73	71.5	118
SACRAMENTO R A HAMILTON CITY	3/10/05 7:30	11	75.7	2.03	2.08	<0.033	<0.011	1.29	1.39	1.09	1.37	<3.34	1052
SACRAMENTO R A HAMILTON CITY	4/20/05 12:00	15.9	39.3	1.99	2.09	<0.022	<0.009	1.02	1.02	1.13	1.25	14.1	142
SACRAMENTO R A HAMILTON CITY	5/19/05 9:30	1075	6686	1.66	3.17	<0.058	0.076	2.69	18.9	3.11	18.7	728	37.8
SACRAMENTO R A HAMILTON CITY	6/28/05 7:15	106	121	1.37	1.58	<0.009	<0.012	0.52	1.1	1.15	1.7	116	66.9
SACRAMENTO R A HAMILTON CITY	7/26/05 12:45	1.65	31.4	1.31	1.34	<0.011	0.007	0.63	0.69	0.73	0.81	<1.51	114
SACRAMENTO R A HAMILTON CITY	8/23/05 11:20	14.1	44.8	1.39	1.47	<0.009	0.016	0.46	0.68	0.85	1.13	<4.26	276
SACRAMENTO R A HAMILTON CITY	9/27/05 10:00	27.7	98.8	1.41	1.43	0.007	0.011	0.54	0.64	0.85	1.14	16.5	107
SACRAMENTO R A HAMILTON CITY	10/25/05 12:40	30.9	61.6	1.54	1.56	<0.009	<0.009	0.63	0.72	1	1.1	17.2	102
SACRAMENTO R A HAMILTON CITY	11/15/05 11:00	30.8	67.6	1.84	1.92	<0.009	0.014	0.79	0.82	1.07	1.22	26	58.1
SACRAMENTO R A HAMILTON CITY	12/14/05 11:45	6.67	36.7	1.94	2.1	<0.005	0.008	0.79	0.89	0.81	0.84	2.6	4787
SACRAMENTO R A HAMILTON CITY	1/4/06 7:30	866	3462	1.61	2.35	0.014	0.092	2.61	9.71	2.47	11.2	569	923
SACRAMENTO R A HAMILTON CITY	1/24/06 7:30	359	709	1.41	1.49	0.011	0.042	1.51	2.4	1.62	2.92	234	913
SACRAMENTO R A HAMILTON CITY	2/21/06 12:45	222	733	1.3	1.47	0.014	0.029	1.18	2.34	1.12	2.55	139	6110
SACRAMENTO R A HAMILTON CITY	3/1/06 7:30	2887	4955	1.36	1.85	0.021	0.087	4.99	11.2	4.26	11.5	1773	2897
SACRAMENTO R A HAMILTON CITY	4/17/06 6:00	914	2219	1.06	1.47	<0.1	<0.1	1.69	8.11	2.51	6.68	556	258
SACRAMENTO R A HAMILTON CITY	5/17/06 6:40	163	285	1.42	1.57	<0.1	<0.1	0.59	0.74	1.25	1.71	114	236
SACRAMENTO R A HAMILTON CITY	6/27/06 6:30	200	398	1.27	1.4	<0.1	<0.1	0.74	1.29	1.09	1.49	38.8	138
SACRAMENTO R A HAMILTON CITY	7/25/06 5:40	255	570	1.24	1.32	<0.1	<0.1	0.92	1.01	1.14	1.66	65.1	276
SACRAMENTO R A HAMILTON CITY	8/22/06 6:40	195	298	1.12	1.15	<0.1	<0.1	0.67	0.84	1.09	1.41	180	374
SACRAMENTO R A HAMILTON CITY	9/20/06 6:30	591	882	1.12	1.23	<0.1	<0.1	0.61	1.35	1.07	1.84	81.4	217
SACRAMENTO R A HAMILTON CITY	10/24/06 7:00	36.8	201	0.859	1.37	<0.1	<0.1	0.56	0.83	0.75	1.47	34.5	65.2
SACRAMENTO R A HAMILTON CITY	12/12/06 6:40	181	905	1.98	2.33	<0.1	<0.1	0.52	1.33	1.18	1.89	34.5	79.4
SACRAMENTO R A HAMILTON CITY	1/9/07 7:15	61.6	138	2.08	2.23	<0.1	<0.1	0.66	0.91	0.9	1.04	49.3	916
SACRAMENTO R A HAMILTON CITY	2/25/07 14:00	478	657	1.31	1.42	<0.1	<0.1	1.81	1.91	2.99	5.9	593	191
SACRAMENTO R A HAMILTON CITY	3/20/07 6:50	16.1	91.6	2.17	2.36	<0.1	<0.1	0.41	0.71	1.22	1.55	26.6	65.8
SACRAMENTO R A HAMILTON CITY	4/17/07 7:30	12.8	52	1.93	1.94	<0.1	<0.1	0.43	0.58	1.54	1.84	13.4	73.9
SACRAMENTO R A HAMILTON CITY	5/29/07 12:15	3.21	37.2	1.9	2.11	<0.1	<0.1	0.52	0.72	1.26	1.65	4.6	77.2
SACRAMENTO R A HAMILTON CITY	6/26/07 12:30	6.11	50.1	1.6	1.67	<0.1	<0.1	0.52	0.75	1.07	1.39	11.4	135
SACRAMENTO R A HAMILTON CITY	7/18/07 7:00	10.8	114	1.62	1.69	<0.1	<0.1	0.47	0.84	1.15	1.53	6.2	65.2
SACRAMENTO R A HAMILTON CITY	8/28/07 7:05	18.4	49.2	1.37	1.58	<0.1	<0.1	0.45	0.6	0.92	1.12	6.2	46.6
SACRAMENTO R A HAMILTON CITY	9/13/07 7:55	2.26	37.9	1.47	1.55	<0.1	<0.1	0.45	0.59	0.63	0.83	5.7	24.7
SACRAMENTO R A HAMILTON CITY	11/7/07 10:30	0.83	10.5	1.96	2.06	<0.1	<0.1	0.4	0.41	0.64	0.75	<0.1	105
SACRAMENTO R A HAMILTON CITY	2/20/08 12:15	5.62	85.8	2.04	2.27	<0.1	<0.1	0.49	0.78	1.09	1.26	7.4	117
SACRAMENTO R A HAMILTON CITY	5/6/08 13:05	2.94	85.3	2.14	2.16	<0.1	<0.1	0.35	0.67	1.43	1.87	10.4	84
SACRAMENTO R A HAMILTON CITY	8/6/08 9:40	2.82	70	1.6	1.68	<0.1	<0.1	0.42	0.54	0.96	1.11	10.2	140
SACRAMENTO R A HAMILTON CITY	11/5/08 7:20	10.2	95.6	2.06	2.17	<0.1	<0.1	0.31	0.51	1.49	1.95	16.4	3210
SACRAMENTO R A HAMILTON CITY	2/24/09 10:40	51.1	3110	1.62	4.07	<0.1	<0.1	0.47	0.71	2.03	8.21	68.6	438
SACRAMENTO R A HAMILTON CITY	5/5/09 8:50	14.7	439	1.83	2.05	<0.1	<0.1	0.35	1.11	1.71	3.09	27.5	36.3
SACRAMENTO R A HAMILTON CITY	8/11/09 8:40	2.75	35.1	1.31	1.35	<0.1	<0.1	0.36	0.46	0.88	1.05	2.3	66.8
SACRAMENTO R A HAMILTON CITY	11/3/09 7:50	2.94	47	1.87	1.94	<0.1	<0.1	0.38	0.49	1.13	1.35	10.6	383
SACRAMENTO R A HAMILTON CITY	2/2/10 8:45	12	340	1.37	1.43	<0.1	<0.1	0.36	1.05	1.76	3.65	17.1	236
SACRAMENTO R A HAMILTON CITY	5/4/10 7:45	10.2	160	1.31	1.85	<0.1	<0.1	0.47	0.96	1.56	2.3	12.3	51.3
SACRAMENTO R A HAMILTON CITY	8/3/10 11:00	7.55	24	1.4	1.42	<0.1	<0.1	0.47	0.58	1.29	1.35	10.4	130
SACRAMENTO R A HAMILTON CITY	11/2/10 8:30	4.63	67.4	1.97	2.06	<0.1	<0.1	0.66	1.27	1.35	1.58	15.3	59.6
SACRAMENTO R A HAMILTON CITY	2/1/11 9:30	5.73	53.6	1.9	1.96	<0.1	<0.1	0.43	0.55	1.29	1.41	12	32.9
SACRAMENTO R A HAMILTON CITY	5/3/11 8:55	3	24.6	1.6	1.73	<0.1	<0.1	0.45	0.52	1.4	1.59	6	176
SACRAMENTO R A HAMILTON CITY	8/2/11 8:10	116	159	1.41	1.45	<0.1	<0.1	0.65	0.79	1.11	1.26	87.6	138
SACRAMENTO R A HAMILTON CITY	11/1/11 8:45	56	91.5	1.21	1.58	<0.1	<0.1	0.64	0.79	0.95	1.31	43	162
SACRAMENTO R A HAMILTON CITY	1/31/12 8:25	178	276	2.04	2.2	<0.1	<0.1	0.52	0.6	1	1.33	94.1	124
SACRAMENTO R A HAMILTON CITY	5/8/12 8:30	88.3	125	2.11	2.64	<0.1	<0.1	0.3	0.45	1.4	1.67	71.9	45.5
SACRAMENTO R A HAMILTON CITY	8/7/12 8:00	10	28.6	1.25	1.28	<0.1	<0.1	0.39	0.5	0.67	0.95	11	41
SACRAMENTO R A HAMILTON CITY	11/6/12 9:35	11.6	12.5	2.09	2.17	<0.1	<0.1	0.48	0.81	0.65	0.81	34.4	124
SACRAMENTO R A HAMILTON CITY	2/6/13 9:15	3.6	127	1.98	2	<0.1	<0.1	0.32	0.75	1.1	1.32	8.2	68.6
SACRAMENTO R A HAMILTON CITY	5/7/13 8:05	19.2	29.5	1.74	1.77	<0.1	<0.1	0.53	0.53	1.07	1.53	32.6	30.1
SACRAMENTO R A HAMILTON CITY	8/6/13 7:30	1.05	20	1.18	1.48	<0.1	<0.1	0.45	0.66	0.53	0.86	4.3	55.2
SACRAMENTO R A HAMILTON CITY	11/5/13 9:10	1.69	24.4	2.06	2.17	<0.1	<0.1	0.39	0.46	0.5	0.82	10.6	26.2
SACRAMENTO R A HAMILTON CITY	2/4/14 9:05	0.19	6.03	2.7	2.88	<0.1	<0.1	0.52	1.31	0.72	0.85	6.2	74.5
SACRAMENTO R A HAMILTON CITY	5/6/14 8:30	4.3	37.2	2.36	2.5	<0.1	<0.1	0.37	0.46	1.48	2.03	10.6	38.1
SACRAMENTO R A HAMILTON CITY	8/12/14 9:50	1.91	18.7	1.93	2.12	<0.1	<0.1	0.44	0.52	0.72	0.87	13	13.1
SACRAMENTO R A HAMILTON CITY	11/5/14 8:50	2.57	62.4	2.05	2.12	<0.1	<0.1	0.48	11.7	0.6	4.03	13.1	2106
SACRAMENTO R A HAMILTON CITY	2/10/15 9:30	21.2	1960	1	2.14	<0.1	<0.1	0.33	5.3	1.99	8	63.2	25.3
SACRAMENTO R A HAMILTON CITY	5/11/15 10:00	21.9	42.4	1.76	1.81	<0.1	<0.1	0.5	0.64	1.7	2.24	25.3	40.9
SACRAMENTO R A HAMILTON CITY	8/11/15 10:20	13.4	32.2	1.65	1.72	<0.1	<0.1	0.33	0.42	0.98	1.18	17.3	36.9
SACRAMENTO R A HAMILTON CITY	11/4/15 11:27	12.6	18.9	2.43	2.61	<0.1	<0.1	0.43	0.53	0.77	0.94	73.6	349
SACRAMENTO R A HAMILTON CITY	2/3/16 12:10	39.7	352	1.26	1.49	<0.1	<0.1	0.44	1.73	1.15	2.14	42.8	186
SACRAMENTO R A HAMILTON CITY	5/9/16 12:15	42.5	183	2.05	2.38	<0.1	<0.1	0.41	1.12	1.75	3	45.7	110
SACRAMENTO R A HAMILTON CITY	8/8/16 8:15	45	100	1.32	1.42	<0.1	<0.1	0.43	0.55	1.26	1.58	48.9	78.3
SACRAMENTO R A HAMILTON CITY	11/7/16 11:00	35.3	78	1.97	2.1	<0.1	<0.1	0.41	0.5	1.06	1.29	29.3	1100
SACRAMENTO R A HAMILTON CITY	2/6/17 13:00	136	1020	1.16	1.67	<0.1	<0.1	0.52	3.85	1.79	5.78	138	10652
Maximum		2887	6686	2.7	4.07	0.021	0.092	4.99	18.9	4.26	18.7	1773	10652
Median		16	91.5	1.615	1.81	0.014	0.016	0.51	0.76	1.115	1.49	25.3	117
Minimum		0.19	6.03	0.859	1.15	0.007	0.007	0.3	0.41	0.5	0.73	2.3	7.8

SWRCB Basin Plan - Drinking Water Standards -Primary MCL	1000												
SWRCB Basin Plan - Drinking Water Standards -Secondary MCL	200												800
Cal EPA/OEHHA - California Public Health Goal	600			0.004					0.02				
USEPA Secondary MCL	50												
Cal EPA - One in a million incremental cancer risk estimate for drinking water				0.023		0.0023			0.07				
USEPA Health Advisory for drinking water				0.02									

Table 3. Sacramento River at Hamilton City, Part 2 of 2

Station Name	Sample Date	Dissolved Lead	Total Lead	Dissolved Manganese	Total Manganese	Total Mercury	Dissolved Nickel	Total Nickel	Dissolved Selenium	Total Selenium	Dissolved Silver	Total Silver	Dissolved Zinc	Total Zinc
		µg/L	µg/L	µg/L	µg/L	ng/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
SACRAMENTO R A HAMILTON CITY	11/25/03 9:10	N/A	0.118	N/A	1.61	N/A	N/A	1.26	N/A	<0.061	N/A	N/A	N/A	1.25
SACRAMENTO R A HAMILTON CITY	3/8/04 13:00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SACRAMENTO R A HAMILTON CITY	5/20/04 15:00	N/A	0.027	N/A	6.14	N/A	N/A	1.31	N/A	0.12	N/A	<0.034	N/A	1.53
SACRAMENTO R A HAMILTON CITY	8/12/04 10:20	N/A	0.08	N/A	6.88	N/A	N/A	1.84	N/A	0.28	N/A	<0.145	N/A	2.07
SACRAMENTO R A HAMILTON CITY	10/5/04 10:05	0.018	0.067	1.13	6.34	N/A	1.25	1.62	<0.144	<0.204	<0.077	<0.054	0.48	1.56
SACRAMENTO R A HAMILTON CITY	11/9/04 11:40	0.004	0.024	1.55	5.42	N/A	1.11	1.33	<0.149	0.25	<0.006	<0.063	0.52	0.88
SACRAMENTO R A HAMILTON CITY	12/7/04 10:40	<0.01	0.011	0.2	1.8	N/A	0.57	0.59	<0.163	0.28	<0.011	<0.04	0.35	0.44
SACRAMENTO R A HAMILTON CITY	1/10/05 12:15	0.064	0.168	2.22	12.4	N/A	1.39	1.98	0.3	0.34	<0.003	<0.002	1.54	3.1
SACRAMENTO R A HAMILTON CITY	2/2/05 7:35	0.029	0.084	2.54	10.6	N/A	1.02	1.53	<0.222	0.27	0.002	0.003	0.95	1.96
SACRAMENTO R A HAMILTON CITY	3/10/05 7:30	0.008	0.049	0.98	6.37	N/A	0.87	1.24	<0.245	<0.19	<0.001	<0.036	0.36	1.06
SACRAMENTO R A HAMILTON CITY	4/20/05 12:00	0.01	0.023	3.12	6.03	N/A	0.76	0.94	0.14	0.35	<0.003	<0.005	0.41	0.75
SACRAMENTO R A HAMILTON CITY	5/19/05 9:30	0.202	3.24	7.33	272	N/A	2.75	30.7	<0.399	<0.317	0.018	0.041	2.46	35
SACRAMENTO R A HAMILTON CITY	6/28/05 7:15	<0.009	<0.027	4.71	5.17	N/A	0.95	1.41	<0.14	<0.354	<0.002	<0.027	0.8	1.05
SACRAMENTO R A HAMILTON CITY	7/26/05 12:45	<0.019	<0.063	0.16	2.07	N/A	0.85	0.95	<0.145	<0.176	<0.002	<0.04	0.36	0.85
SACRAMENTO R A HAMILTON CITY	8/23/05 11:20	<0.004	0.048	0.58	3.38	N/A	0.81	1.16	<0.227	0.29	<0.001	<0.001	0.27	1.09
SACRAMENTO R A HAMILTON CITY	9/27/05 10:00	<0.004	0.047	0.51	4.61	N/A	0.99	1.35	0.23	0.23	<0.003	<0.003	0.38	1.56
SACRAMENTO R A HAMILTON CITY	10/25/05 12:40	0.011	0.028	0.69	2.88	N/A	1.13	1.22	0.11	0.23	<0.002	<0.002	0.52	1.93
SACRAMENTO R A HAMILTON CITY	11/15/05 11:00	0.04	0.047	0.98	4.81	N/A	1.02	1.24	<0.186	<0.186	<0.009	<0.009	0.56	1.25
SACRAMENTO R A HAMILTON CITY	12/14/05 11:45	0.003	0.023	0.53	4.17	N/A	0.9	1.09	<0.149	0.15	<0.001	<0.001	0.5	0.93
SACRAMENTO R A HAMILTON CITY	1/4/06 7:30	0.191	1.89	9.75	134	N/A	2.67	15.4	<0.149	0.22	<0.001	0.021	2.24	20.8
SACRAMENTO R A HAMILTON CITY	1/24/06 7:30	0.062	0.306	9.24	32.4	N/A	1.68	3.32	<0.186	0.19	<0.005	<0.005	1.55	4.71
SACRAMENTO R A HAMILTON CITY	2/21/06 12:45	0.046	0.299	5.83	27.5	N/A	1.53	3.32	<0.149	0.3	<0.009	<0.009	1	3.94
SACRAMENTO R A HAMILTON CITY	3/1/06 7:30	0.648	2.04	23.2	146	N/A	4.69	15.7	<0.149	0.29	<0.009	<0.009	5.79	21.7
SACRAMENTO R A HAMILTON CITY	4/17/06 6:00	0.188	1.01	9.56	70.9	N/A	2.31	8.02	0.23	0.27	<0.003	<0.003	2.57	12.5
SACRAMENTO R A HAMILTON CITY	5/17/06 6:40	<0.04	0.1	2.1	10.1	N/A	1.12	1.46	<0.2	<0.2	<0.003	<0.003	0.67	1.78
SACRAMENTO R A HAMILTON CITY	6/27/06 6:30	<0.04	0.079	0.69	8.87	N/A	1.29	1.87	<0.2	<0.2	<0.003	0.063	0.41	1.71
SACRAMENTO R A HAMILTON CITY	7/25/06 5:40	<0.04	0.094	1.01	9.35	1.8	1.7	2.5	<0.2	<0.2	<0.003	<0.003	0.77	2.04
SACRAMENTO R A HAMILTON CITY	8/22/06 6:40	<0.04	0.077	1.6	7.18	0.89	1.7	2.33	0.25	0.26	<0.003	<0.003	1.02	1.94
SACRAMENTO R A HAMILTON CITY	9/20/06 6:30	<0.04	0.111	2.01	14.2	1.5	1.67	2.76	0.23	0.26	<0.003	<0.003	0.65	4.79
SACRAMENTO R A HAMILTON CITY	10/24/06 7:00	<0.04	0.078	0.87	9.44	0.28	1.01	2.02	0.25	0.28	<0.003	<0.003	0.16	3.3
SACRAMENTO R A HAMILTON CITY	12/12/06 6:40	<0.04	0.186	1.04	16.9	0.72	0.96	1.75	0.25	0.29	<0.003	<0.003	0.55	4.77
SACRAMENTO R A HAMILTON CITY	1/9/07 7:15	<0.04	<0.04	2.22	5.24	0.68	1.01	1.08	<0.2	<0.2	<0.003	<0.003	0.64	2.57
SACRAMENTO R A HAMILTON CITY	2/26/07 14:00	0.262	0.581	10.3	28.8	2.8	2.22	2.99	<0.2	0.23	<0.003	<0.003	3.68	8.39
SACRAMENTO R A HAMILTON CITY	3/20/07 6:50	<0.04	0.056	2.01	8.22	1.6	0.85	1.22	<0.2	<0.2	<0.003	<0.003	0.31	2.82
SACRAMENTO R A HAMILTON CITY	4/17/07 7:30	<0.04	<0.04	3.44	8.78	1	0.8	0.9	0.24	0.33	<0.003	<0.003	0.4	2.84
SACRAMENTO R A HAMILTON CITY	5/29/07 12:15	<0.04	0.044	0.36	5.99	N/A	0.8	1.04	<0.2	0.22	<0.003	<0.003	0.55	2.96
SACRAMENTO R A HAMILTON CITY	6/26/07 12:30	<0.04	0.066	2.52	7.29	0.59	0.9	1.12	<0.2	0.21	<0.003	<0.003	0.73	3.38
SACRAMENTO R A HAMILTON CITY	7/18/07 7:00	<0.04	0.07	0.21	7.42	1.3	0.88	1.27	<0.2	<0.2	<0.003	<0.003	0.3	3.87
SACRAMENTO R A HAMILTON CITY	8/28/07 7:05	<0.04	<0.04	0.46	5.33	N/A	1.07	1.22	<0.2	<0.2	<0.003	<0.003	2	2.29
SACRAMENTO R A HAMILTON CITY	9/13/07 7:55	<0.04	0.055	0.33	4.66	1.7	0.89	1.02	<0.2	<0.2	<0.003	2.11	0.36	<0.1
SACRAMENTO R A HAMILTON CITY	11/7/07 10:30	<0.04	<0.04	0.08	3.01	0.32	0.58	0.82	<0.2	<0.2	<0.003	<0.003	0.17	2.09
SACRAMENTO R A HAMILTON CITY	2/20/08 12:15	<0.04	0.041	0.7	8.15	N/A	0.88	0.95	<0.2	0.22	<0.003	<0.003	0.71	3.31
SACRAMENTO R A HAMILTON CITY	5/6/08 13:05	<0.04	0.061	0.27	8.38	N/A	1	1.12	<0.2	<0.2	<0.003	<0.003	0.22	3.21
SACRAMENTO R A HAMILTON CITY	8/6/08 9:40	<0.04	0.044	0.39	4.98	N/A	1.04	1.2	<0.2	<0.2	<0.003	<0.003	0.45	2.43
SACRAMENTO R A HAMILTON CITY	11/5/08 7:20	<0.04	0.09	0.35	10.4	N/A	1.22	1.6	<0.2	<0.2	<0.003	<0.003	0.93	3.51
SACRAMENTO R A HAMILTON CITY	2/24/09 10:40	<0.04	1.47	1.28	101	N/A	2.59	11	0.2	0.25	<0.003	<0.003	0.52	14.3
SACRAMENTO R A HAMILTON CITY	5/5/09 8:50	<0.04	0.289	0.53	17.7	N/A	0.85	1.76	<0.2	<0.2	<0.003	<0.003	1.07	6.22
SACRAMENTO R A HAMILTON CITY	8/11/09 8:40	<0.04	<0.04	0.22	2.36	N/A	0.74	0.84	<0.2	<0.2	<0.003	<0.003	0.45	2.26
SACRAMENTO R A HAMILTON CITY	11/3/09 7:50	<0.04	0.071	0.38	7.29	N/A	0.74	0.93	<0.2	<0.2	<0.003	<0.003	0.65	3.08
SACRAMENTO R A HAMILTON CITY	2/2/10 8:45	<0.04	0.188	1.01	17.1	N/A	1.78	2.08	<0.2	<0.2	<0.003	<0.003	1.39	5.43
SACRAMENTO R A HAMILTON CITY	5/4/10 7:45	<0.04	0.11	0.52	14	N/A	0.79	1.32	<0.2	<0.2	<0.003	<0.003	0.62	2.91
SACRAMENTO R A HAMILTON CITY	8/3/10 11:00	<0.04	<0.04	0.62	4.15	N/A	0.85	1.11	<0.2	<0.2	<0.003	<0.003	0.62	2.51
SACRAMENTO R A HAMILTON CITY	11/2/10 8:30	<0.04	0.09	0.73	12.5	N/A	1.34	1.82	<0.2	0.228	<0.003	<0.003	2.32	3.13
SACRAMENTO R A HAMILTON CITY	2/1/11 9:30	<0.04	<0.04	0.67	6.4	N/A	0.71	0.9	<0.2	<0.2	<0.003	<0.003	0.76	2.68
SACRAMENTO R A HAMILTON CITY	5/3/11 8:55	<0.04	<0.04	0.49	5.05	N/A	0.6	0.65	<0.2	<0.2	<0.003	<0.003	0.28	0.51
SACRAMENTO R A HAMILTON CITY	8/2/11 8:10	<0.04	0.061	1.47	6.38	N/A	1.1	1.37	<0.2	<0.2	<0.003	<0.003	0.77	1.63
SACRAMENTO R A HAMILTON CITY	11/1/11 8:45	<0.04	<0.04	1.44	4.4	N/A	1.37	1.68	<0.2	<0.2	<0.003	<0.003	0.59	2.11
SACRAMENTO R A HAMILTON CITY	1/31/12 8:25	<0.04	<0.04	1.87	9.58	N/A	0.68	1.11	<0.2	<0.2	<0.003	<0.003	1.17	2.32
SACRAMENTO R A HAMILTON CITY	5/8/12 8:30	<0.04	<0.04	5.73	7.97	N/A	0.68	0.79	<0.2	<0.2	<0.003	<0.003	0.48	1.79
SACRAMENTO R A HAMILTON CITY	8/7/12 8:00	<0.04	<0.04	0.41	2.81	0.8	0.79	1.36	<0.2	<0.2	<0.003	<0.003	0.41	1.83
SACRAMENTO R A HAMILTON CITY	11/6/12 9:35	<0.04	<0.04	2.19	3.12	3.4	0.96	1.08	<0.2	<0.2	<0.003	<0.003	0.67	1.34
SACRAMENTO R A HAMILTON CITY	2/6/13 9:15	<0.04	<0.04	0.35	5.45	1.3	0.44	0.65	<0.2	<0.2	<0.003	<0.003	0.93	1.45
SACRAMENTO R A HAMILTON CITY	5/7/13 8:05	<0.04	<0.04	1.2	3.14	0.9	0.85	1.03	<0.2	<0.2	<0.003	<0.003	0.52	1.11
SACRAMENTO R A HAMILTON CITY	8/6/13 7:30	<0.04	<0.04	0.12	2.4	0.6	1.27	1.63	<0.2	<0.2	<0.003	<0.003	<0.1	1.09
SACRAMENTO R A HAMILTON CITY	11/5/13 9:10	<0.04	<0.04	0.58	3.53	<0.5	0.6	0.89	<0.2	<0.2	<0.003	<0.003	0.45	1.16
SACRAMENTO R A HAMILTON CITY	2/4/14 9:05	<0.04	<0.04	0.35	2.17	0.8	0.54	0.69	<0.2	0.21	<0.003	<0.003	0.21	0.97
SACRAMENTO R A HAMILTON CITY	5/6/14 8:30	<0.04	<0.04	0.74	6.62	2.5	0.47	0.7	<0.2	<0.2	<0.003	<0.003	0.38	1.24
SACRAMENTO R A HAMILTON CITY	8/12/14 9:50	<0.04	<0.04	0.99	2.82	N/A	0.76	0.84	<0.2	<0.2	<0.003	<0.003	0.37	0.74
SACRAMENTO R A HAMILTON CITY	11/5/14 8:50	<0.04	0.173	0.79	9.25	N/A	1.58	7.22	<0.2	<0.2	<0.003	<0.003	0.37	34
SACRAMENTO R A HAMILTON CITY	2/10/15 9:30	<0.04	1.52	0.96	59.6	29.1	1.36	6.88	0.26	0.31	<0.003	0.037	0.38	13.9
SACRAMENTO R A HAMILTON CITY	5/11/15 10:00	<0.04	0.048	1.15	6.15	1.1	0.92	1.27	<0.2	<0.2	<0.003	<0.003	0.62	1.37
SACRAMENTO R A HAMILTON CITY	8/11/15 10:20	<0.04	<0.04	0.91	3.21	4.4	0.88	1.36	0.34	0.35	<0.003	<0.003	<0.1	0.4
SACRAMENTO R A HAMILTON CITY	11/4/15 11:27	<0.04	<0.04	1.16	2.67	<0.5	0.66	0.92	<0.2	<0.2	<0.003	<0.003	0.5	1.06
SACRAMENTO R A HAMILTON CITY	2/3/16 12:10	<0.04	0.204	0.62	17.7	3.5	1.26	2.47	0.21	0.28	<0.003	<0.003	0.75	2.98
SACRAMENTO R A HAMILTON CITY	5/9/16 12:15	<0.04	0.194	2.28	16.8	N/A	1.05	1.78	<0.2	<0.2	<0.003	<0.003	0.49	3.45
SACRAMENTO R A HAMILTON CITY	8/8/16 8:15	<0.04	0.046	0.24	4.35	N/A	1.							

Table 4. Sacramento River op Moulton Weir, Part 1 of 2

Station Name	Sample Date	Dissolved Aluminum µg/L	Total Aluminum µg/L	Dissolved Arsenic µg/L	Total Arsenic µg/L	Dissolved Cadmium µg/L	Total Cadmium µg/L	Dissolved Chromium µg/L	Total Chromium µg/L	Dissolved Copper µg/L	Total Copper µg/L	Dissolved Iron µg/L	Total Iron µg/L
SACRAMENTO R OPP MOULTON WR	5/14/03 14:15	22.6	584	1.46	1.67	0.01	0.078	1.34	2.25	0.93	3.17	4.1	813
SACRAMENTO R OPP MOULTON WR	6/10/03 9:00	15.8	180	1.83	1.88	<0.031	<0.031	0.84	0.91	0.71	1.52	<2.08	214
SACRAMENTO R OPP MOULTON WR	7/10/03 10:40	36.4	116	1.58	1.69	<0.009	<0.009	0.65	0.83	1.29	1.3	17.1	137
SACRAMENTO R OPP MOULTON WR	8/13/03 11:45	4.42	215	1.45	1.5	<0.004	<0.049	0.77	0.95	0.79	1.45	<2.45	317
SACRAMENTO R OPP MOULTON WR	9/3/03 12:30	5.91	304	1.43	1.51	<0.01	<0.01	0.73	1.02	1.23	2.24	<3.1	449
SACRAMENTO R OPP MOULTON WR	10/8/03 12:40	33.5	117	0.879	1.3	<0.011	0.009	0.17	0.78	0.97	1.32	25.1	172
SACRAMENTO R OPP MOULTON WR	11/5/03 11:00	64	131	1.47	1.63	<0.02	<0.004	<0.209	1.9	1.06	1.59	61.6	351
SACRAMENTO R OPP MOULTON WR	12/8/03 10:45	1193	3448	1.63	2.84	0.019	0.175	2.23	9.75	4.25	16.4	852	5689
SACRAMENTO R OPP MOULTON WR	1/6/04 9:30	262	1248	1.73	2.13	<0.008	0.045	1.04	4.56	2.21	7.7	193	2131
SACRAMENTO R OPP MOULTON WR	2/4/04 12:20	1614	1950	1.04	1.44	<0.011	0.037	2.17	5.11	3.82	6.17	106.2	2748
SACRAMENTO R OPP MOULTON WR	2/17/04 12:00	2521	8733	1.59	2.8	<0.015	0.232	9.17	24.8	7.64	27.7	2035	13032
SACRAMENTO R OPP MOULTON WR	3/8/04 11:40	184	1478	1.44	1.83	0.011	0.053	0.8	4.03	1.93	6.89	135	2133
SACRAMENTO R OPP MOULTON WR	4/7/04 9:45	26.9	160	1.61	1.74	0.009	0.013	0.74	1.16	1.46	1.99	16.6	238
SACRAMENTO R OPP MOULTON WR	5/5/04 11:00	6.14	289	1.77	1.83	0.004	0.027	0.54	1.3	0.78	2.83	<3.73	390
SACRAMENTO R OPP MOULTON WR	6/9/04 10:00	185	302	1.75	1.84	0.011	0.013	0.66	1.53	1.65	2.43	123	349
SACRAMENTO R OPP MOULTON WR	7/29/04 10:40	100	155	1.4	1.43	0.005	0.011	0.63	0.91	1.06	1.74	52.7	162
SACRAMENTO R OPP MOULTON WR	10/5/04 11:00	14.3	89	1.22	1.34	<0.011	<0.008	0.8	0.94	0.73	1.28	9.8	116
SACRAMENTO R OPP MOULTON WR	11/9/04 13:00	20	76.2	2.34	2.4	<0.008	<0.007	0.9	0.93	0.89	1.38	14.5	59.5
SACRAMENTO R OPP MOULTON WR	12/7/04 10:20	3.4	82.6	2.25	2.27	<0.012	<0.034	1.86	1.93	0.89	1.07	<4.5	314
SACRAMENTO R OPP MOULTON WR	1/10/05 11:00	459	1259	1.36	1.6	<0.011	<0.007	1.81	3.91	2.41	4.96	304	1706
SACRAMENTO R OPP MOULTON WR	2/2/05 12:25	170	582	1.51	1.58	<0.011	<0.066	2.02	2.55	1.7	3.21	143	386
SACRAMENTO R OPP MOULTON WR	3/10/05 14:45	10.2	133	1.91	1.97	<0.033	<0.011	1.52	1.74	1.17	1.62	13	222
SACRAMENTO R OPP MOULTON WR	4/20/05 10:50	20.7	130	1.97	2.07	<0.022	<0.009	1.08	1.52	1.16	1.48	33.4	182
SACRAMENTO R OPP MOULTON WR	5/19/05 11:15	314	5936	1.34	3.07	<0.058	0.138	1.37	3.8	1.81	20.9	196	9164
SACRAMENTO R OPP MOULTON WR	6/28/05 15:05	103	126	1.42	1.65	<0.009	<0.012	0.62	1.1	1.32	1.34	98.3	148
SACRAMENTO R OPP MOULTON WR	7/26/05 11:00	7.14	197	1.45	1.46	0.007	0.014	0.48	0.98	0.93	1.42	<3.27	270
SACRAMENTO R OPP MOULTON WR	8/23/05 9:30	8.08	84.1	1.52	1.57	<0.009	<0.009	0.5	0.59	0.89	1.08	<4.16	130
SACRAMENTO R OPP MOULTON WR	9/28/05 8:30	17.3	82.5	1.41	1.46	0.007	0.017	1	1.31	0.88	1.16	10.6	125
SACRAMENTO R OPP MOULTON WR	10/25/05 10:30	21.8	190	1.5	1.52	0.013	0.019	0.57	1.08	1.06	1.59	13.8	258
SACRAMENTO R OPP MOULTON WR	11/14/05 12:00	18.3	297	1.93	2.16	0.012	0.033	0.79	1.35	1.22	2.24	15.8	453
SACRAMENTO R OPP MOULTON WR	12/14/05 11:40	9.4	71.4	1.84	2.04	0.01	0.017	0.77	1.03	0.92	1.24	5.2	114
SACRAMENTO R OPP MOULTON WR	1/4/06 10:40	2779	4845	1.84	2.53	0.024	0.096	6.91	14.1	5.21	14.3	1670	6695
SACRAMENTO R OPP MOULTON WR	1/24/06 13:10	413	1419	1.45	1.85	0.013	0.062	1.53	4.53	1.77	5.63	283	2016
SACRAMENTO R OPP MOULTON WR	2/22/06 11:40	263	848	1.37	1.68	0.018	0.05	1.76	2.94	1.15	3.79	176	1189
SACRAMENTO R OPP MOULTON WR	3/1/06 12:10	4357	6132	1.58	1.99	0.029	0.105	6.51	13.4	5.76	14.6	2579	7827
SACRAMENTO R OPP MOULTON WR	4/17/06 11:10	1232	2222	1.06	1.56	<0.1	<0.1	2.23	5.68	2.73	7.09	782	2269
SACRAMENTO R OPP MOULTON WR	5/17/06 11:35	129	511	1.48	1.64	<0.1	<0.1	0.81	1.24	1.18	2.32	95.3	486
SACRAMENTO R OPP MOULTON WR	6/27/06 10:25	47.7	677	1.37	1.67	<0.1	<0.1	1.22	2.05	1.04	1.78	9.9	392
SACRAMENTO R OPP MOULTON WR	7/26/06 8:20	228	793	1.28	1.38	<0.1	<0.1	0.5	1.39	1.22	2.1	60.9	436
SACRAMENTO R OPP MOULTON WR	8/22/06 10:50	157	272	1.1	1.16	<0.1	<0.1	0.61	0.93	1.11	1.44	311	271
SACRAMENTO R OPP MOULTON WR	9/20/06 11:35	351	633	1.06	1.15	<0.1	<0.1	0.55	1.23	1.07	1.6	56.5	285
SACRAMENTO R OPP MOULTON WR	10/24/06 12:15	31.7	226	1.23	1.44	<0.1	<0.1	0.66	1.09	1.29	1.55	58.7	208
SACRAMENTO R OPP MOULTON WR	12/12/06 12:35	103	1584	2.6	2.74	<0.1	<0.1	0.49	3.25	1.44	2.86	133	593
SACRAMENTO R OPP MOULTON WR	1/9/07 13:00	81.8	284	1.93	2.11	<0.1	<0.1	1.66	1.74	1.02	1.4	55.9	287
SACRAMENTO R OPP MOULTON WR	2/27/07 10:00	457	524	1.27	1.38	<0.1	<0.1	1.91	2.02	2.93	3.62	464	829
SACRAMENTO R OPP MOULTON WR	3/20/07 11:15	17.6	96.9	2.13	2.36	<0.1	<0.1	0.49	0.72	1.18	1.59	26.2	166
SACRAMENTO R OPP MOULTON WR	4/18/07 10:15	16.6	105	1.9	1.98	<0.1	<0.1	0.45	0.76	1.53	2.13	15.1	139
SACRAMENTO R OPP MOULTON WR	5/30/07 9:00	3.42	99.8	2.07	2.22	<0.1	<0.1	0.5	0.94	1.28	2.09	4.7	179
SACRAMENTO R OPP MOULTON WR	6/27/07 8:00	5.35	110	1.66	1.75	<0.1	<0.1	0.5	0.95	1.09	1.68	15.4	136
SACRAMENTO R OPP MOULTON WR	7/19/07 10:05	6.46	107	1.77	1.81	<0.1	<0.1	0.47	0.86	1.02	1.49	4.4	159
SACRAMENTO R OPP MOULTON WR	8/28/07 10:40	1.04	34.3	1.69	1.72	<0.1	<0.1	0.42	0.59	0.86	1.01	2.7	51.4
SACRAMENTO R OPP MOULTON WR	9/13/07 11:40	2.77	33.8	1.44	1.61	<0.1	<0.1	0.46	0.57	0.81	0.88	5.4	46.1
SACRAMENTO R OPP MOULTON WR	10/31/07 10:55	2.04	41.1	2.18	2.23	<0.1	<0.1	0.4	0.59	0.81	1.13	9.1	112
SACRAMENTO R OPP MOULTON WR	11/27/07 11:50	0.87	27.8	2.27	2.44	<0.1	<0.1	0.48	0.54	0.78	0.9	7.3	65.7
SACRAMENTO R OPP MOULTON WR	1/23/08 12:40	3.9	218	2.63	2.75	<0.1	<0.1	0.54	1.47	1.12	1.89	5.2	273
SACRAMENTO R OPP MOULTON WR	2/27/08 10:50	10.4	1710	1.06	1.73	<0.1	<0.1	0.41	6.45	2.06	6.7	20.4	1852
SACRAMENTO R OPP MOULTON WR	3/26/08 10:10	2	56.4	2.27	2.36	<0.1	<0.1	0.42	0.73	1.26	1.61	4.9	121
SACRAMENTO R OPP MOULTON WR	4/23/08 10:30	4.59	121	2.14	2.2	<0.1	<0.1	0.43	0.88	1.35	1.95	5	188
SACRAMENTO R OPP MOULTON WR	7/24/08 11:15	2.02	62.8	1.65	1.78	<0.1	<0.1	0.4	0.6	1.07	1.25	5.1	92.9
SACRAMENTO R OPP MOULTON WR	4/22/09 11:10	3.89	66.2	2.14	2.29	<0.1	<0.1	0.38	0.58	1.67	2.11	10.1	98.6
SACRAMENTO R OPP MOULTON WR	5/28/09 12:15	2.79	86.6	1.89	1.97	<0.1	<0.1	0.35	0.57	1.81	1.96	8.6	95.8
SACRAMENTO R OPP MOULTON WR	6/25/09 9:25	3.27	101	1.43	1.52	<0.1	<0.1	0.36	0.61	1.37	1.7	6.3	326
SACRAMENTO R OPP MOULTON WR	7/28/09 10:30	7.77	142	1.39	1.53	<0.1	<0.1	0.45	0.69	1.07	1.5	11.8	136
SACRAMENTO R OPP MOULTON WR	8/27/09 9:30	1.66	30.7	1.19	1.24	<0.1	<0.1	0.35	0.46	0.88	1.06	3	38.2
SACRAMENTO R OPP MOULTON WR	9/24/09 9:50	2.09	35.9	1.34	1.36	<0.1	<0.1	0.34	0.45	0.96	1.05	4.3	40.2
SACRAMENTO R OPP MOULTON WR	10/27/09 11:40	5.31	98.5	1.76	1.85	<0.1	<0.1	0.39	0.44	1.04	1.5	17.3	123
SACRAMENTO R OPP MOULTON WR	11/18/09 11:30	2.56	60	1.94	2.14	<0.1	<0.1	0.4	0.7	0.98	1.45	8	113
SACRAMENTO R OPP MOULTON WR	12/9/09 8:15	1.73	25.8	2.53	2.64	<0.1	<0.1	0.45	0.53	0.92	1.02	3.1	51.7
SACRAMENTO R OPP MOULTON WR	1/26/10 8:45	87.7	3953	1.3	2.43	<0.1	0.144	0.59	14.7	3.45	20.2	114	4700
SACRAMENTO R OPP MOULTON WR	3/2/10 13:15	13.9	793	1.15	1.51	<0.1	<0.1	0.39	3.19	1.56	4.3	29.5	947
SACRAMENTO R OPP MOULTON WR	3/24/10 7:10	1.83	54.6	1.72	1.76	<0.1	<0.1	0.33	0.65	0.95	1.29	5.6	94.2
SACRAMENTO R OPP MOULTON WR	4/21/10 7:00	3.67	780	1.45	1.69	<0.1	<0.1	0.46	3.47	1.43	3.93	8.3	1018
SACRAMENTO R OPP MOULTON WR	5/26/10 7:00	3.46	49.6	1.2	1.26	<0.1	<0.1	0.4	0.54	1.61	1.75	1.4	69.7
SACRAMENTO R OPP MOULTON WR	6/30/10 7:00	6.01	52.4	1.28	1.46	<0.1	<0.1	0.35	0.51	1.17	1.46	5.5	71.9
SACRAMENTO R OPP MOULTON WR	7/28/10 8:40	3.8	29	1.4	1.45	<0.1	<0.1	0.44	0.56	1.33	1.45	3.8	68.8
SACRAMENTO R OPP MOULTON WR	8/31/10 10:10	6.25	34.7	1.22	1.24	<0.1	<0.1	0.27	0.6	1.19	1.28	3.5	76.2
SACRAMENTO R OPP MOULTON WR	10/26/10 8:00	12.9	682	1.55	3.49	<0.1	<0.1	0.42	3.07	1.79	3.95	25.6	336
SACRAMENTO R OPP MOULTON WR	11/30/10 8:50	4.11	48.3	1.67	1.89	<0.1	<0.1	0.58	0.73	1.19	1.29	6.9	75.1
SACRAMENTO R OPP MOULTON WR	12/13/10 11:20	2.71	93.3	1.46	1.52	<0.1	<0.1	0.44	0.91	1.21	1.66	9.1	154
SACRAMENTO R OPP MOULTON WR	1/18/11 10:45	6.13	500	1.48	1.6	<0.1	<0.1	0.47	2.3	1.45	2.77	18.3	547
	Maximum	4357	8733	2.63	3.49	0.029	0.232	9.17	24.8	7.64	27.7	2579	13032
	Median	14.1	148.5	1.505	1.735	0.011	0.041	0.55	1.035	1.185	1.67	15.4	198
	Minimum	0.87	25.8	0.879	1.15	0.004	0.009	0.17	0.45	0.71	0.88	1.4	38.2
SWRCB Basin Plan - Drinking Water Standards -Primary MCL			1000										
SWRCB Basin Plan - Drinking Water Standards -Secondary MCL			200		</								

Table 4. Sacramento River opp Moulton Weir, Part 2 of 2

Station Name	Sample Date	Dissolved Lead µg/L	Total Lead µg/L	Dissolved Manganese µg/L	Total Manganese µg/L	Total Mercury ng/L	Dissolved Nickel µg/L	Total Nickel µg/L	Dissolved Selenium µg/L	Total Selenium µg/L	Dissolved Silver µg/L	Total Silver µg/L	Dissolved Zinc µg/L	Total Zinc µg/L
SACRAMENTO R OPP MOULTON WR	5/14/03 14:15	<0.025	0.299	0.17	20.7	N/A	0.65	3.17	0.11	0.2	<0.025	<0.273	0.4	4.5
SACRAMENTO R OPP MOULTON WR	6/10/03 9:00	<0.017	0.068	0.14	7.15	N/A	0.52	1.38	0.18	<0.296	<0.001	<0.251	0.3	1.5
SACRAMENTO R OPP MOULTON WR	7/10/03 10:40	0.012	0.055	2.05	5.66	N/A	0.92	1.26	<0.129	0.17	<0.011	<0.123	0.35	1.6
SACRAMENTO R OPP MOULTON WR	8/13/03 11:45	<0.003	0.124	0.48	9.98	N/A	0.95	1.8	<0.163	0.21	<0.015	<0.122	0.46	2.24
SACRAMENTO R OPP MOULTON WR	9/3/03 12:30	<0.007	0.183	0.1	18.6	N/A	1.1	2.29	<0.21	0.26	<0.144	<0.144	0.41	3.16
SACRAMENTO R OPP MOULTON WR	10/8/03 12:40	0.028	0.085	4.96	9.5	N/A	1.16	1.64	<0.327	<0.162	<0.01	<0.131	0.62	1.47
SACRAMENTO R OPP MOULTON WR	11/5/03 11:00	0.029	0.057	6.6	8.03	N/A	1.33	1.61	0.17	0.22	<0.02	<0.04	0.9	1.3
SACRAMENTO R OPP MOULTON WR	12/8/03 10:45	0.385	2.93	9.6	218	N/A	3.19	15.7	0.12	0.28	0.037	0.049	10.4	31.6
SACRAMENTO R OPP MOULTON WR	1/6/04 9:30	0.085	0.877	4.62	52.9	N/A	1.53	7.62	0.1	<0.248	<0.007	<0.014	0.9	10.9
SACRAMENTO R OPP MOULTON WR	2/4/04 12:20	0.306	1.2	11.3	83.1	N/A	3.16	8.72	0.11	<0.282	<0.015	0.088	4.09	14.4
SACRAMENTO R OPP MOULTON WR	2/17/04 12:00	0.677	4.8	31.2	381	N/A	6.92	44.5	<0.121	0.26	<0.016	0.06	7.53	56.8
SACRAMENTO R OPP MOULTON WR	3/8/04 11:40	0.054	0.541	3.02	59.7	N/A	1.28	7.41	0.2	0.31	0.04	<0.065	1.04	10.6
SACRAMENTO R OPP MOULTON WR	4/7/04 9:45	<0.022	0.09	2.06	10	N/A	1.14	1.76	<0.112	0.53	0.02	<0.031	0.5	1.54
SACRAMENTO R OPP MOULTON WR	5/5/04 11:00	<0.007	0.13	1.58	12.3	N/A	0.87	2.16	<0.166	0.23	<0.001	<0.044	0.19	2.57
SACRAMENTO R OPP MOULTON WR	6/9/04 10:00	0.082	0.112	4.82	10.2	N/A	1.3	1.99	<0.121	<0.226	<0.014	<0.081	1.22	2.38
SACRAMENTO R OPP MOULTON WR	7/29/04 10:40	0.017	0.059	1.81	4.98	N/A	1.02	1.46	0.15	0.27	<0.008	<0.067	0.47	1.31
SACRAMENTO R OPP MOULTON WR	10/5/04 11:00	0.011	0.049	2.04	7.22	N/A	1.16	1.44	<0.144	<0.204	<0.077	<0.054	0.45	1.09
SACRAMENTO R OPP MOULTON WR	11/9/04 13:00	0.008	0.04	1.69	8.14	N/A	1.09	1.24	<0.149	0.19	<0.006	<0.063	0.46	0.89
SACRAMENTO R OPP MOULTON WR	12/7/04 10:20	<0.01	0.054	0.68	7.19	N/A	0.61	0.84	<0.163	0.37	<0.011	<0.04	0.2	0.88
SACRAMENTO R OPP MOULTON WR	1/10/05 11:00	0.091	0.609	2.64	43.2	N/A	1.79	6.19	0.31	0.46	0.005	0.01	1.11	7.93
SACRAMENTO R OPP MOULTON WR	2/2/05 12:25	0.058	0.404	2.79	23.2	N/A	1.45	4.05	<0.222	0.36	0.002	0.007	0.77	4.12
SACRAMENTO R OPP MOULTON WR	3/10/05 14:45	0.011	0.094	0.78	7.17	N/A	0.83	1.6	<0.245	0.29	<0.001	<0.036	0.24	1.26
SACRAMENTO R OPP MOULTON WR	4/20/05 10:50	0.021	0.079	2.74	10.8	N/A	0.8	1.42	0.25	0.28	<0.003	<0.005	0.56	1.37
SACRAMENTO R OPP MOULTON WR	5/19/05 11:15	0.04	3.35	2.73	268	N/A	1.38	31.5	<0.399	<0.317	<0.009	0.045	1.14	39.4
SACRAMENTO R OPP MOULTON WR	6/28/05 15:05	<0.009	0.041	4.35	4.85	N/A	0.72	1.18	0.31	0.38	<0.002	<0.027	1	1.28
SACRAMENTO R OPP MOULTON WR	7/26/05 11:00	<0.018	0.039	0.63	7.35	N/A	0.69	1.55	<0.222	<0.222	<0.013	<0.013	0.55	1.86
SACRAMENTO R OPP MOULTON WR	8/23/05 9:30	<0.004	0.045	0.66	5.73	N/A	0.69	1.11	<0.227	<0.227	<0.001	<0.001	0.14	0.88
SACRAMENTO R OPP MOULTON WR	9/28/05 8:30	<0.004	0.048	0.45	4.75	N/A	0.88	1.25	0.18	0.22	<0.003	<0.003	0.23	1.13
SACRAMENTO R OPP MOULTON WR	10/25/05 10:30	0.021	0.114	1.28	10.6	N/A	1.04	1.77	<0.063	0.18	<0.002	<0.002	0.53	1.81
SACRAMENTO R OPP MOULTON WR	11/14/05 12:00	0.013	0.212	1.27	26.9	N/A	1.04	2.36	<0.186	<0.186	<0.009	<0.009	0.73	3.62
SACRAMENTO R OPP MOULTON WR	12/14/05 11:40	0.008	0.079	0.68	6.17	N/A	1.05	1.33	<0.149	0.19	<0.001	<0.001	0.66	1.78
SACRAMENTO R OPP MOULTON WR	1/4/06 10:40	0.626	2.64	24.9	164	N/A	5.91	22.2	<0.149	0.15	0.011	0.028	4.66	22.9
SACRAMENTO R OPP MOULTON WR	1/24/06 13:10	0.105	0.749	13.6	60.3	N/A	1.78	6.85	0.23	0.28	<0.005	<0.005	1.54	9.49
SACRAMENTO R OPP MOULTON WR	2/22/06 11:40	0.058	0.538	6.68	40.1	N/A	1.44	4.63	0.16	0.23	<0.009	<0.009	0.83	5.22
SACRAMENTO R OPP MOULTON WR	3/1/06 12:10	0.852	2.81	35.8	207	N/A	6.24	19.6	<0.149	0.2	<0.009	<0.009	7.67	27.9
SACRAMENTO R OPP MOULTON WR	4/17/06 11:10	0.271	1.27	13.8	83.2	N/A	2.88	9.26	<0.2	0.22	<0.03	<0.03	2.99	12.8
SACRAMENTO R OPP MOULTON WR	5/17/06 11:35	<0.04	0.183	2.83	19.1	N/A	1.08	2.15	0.22	0.26	<0.03	<0.03	0.39	2.53
SACRAMENTO R OPP MOULTON WR	6/27/06 10:25	<0.04	0.133	0.32	13.6	N/A	1	2.08	<0.2	<0.2	<0.03	0.066	0.19	2.06
SACRAMENTO R OPP MOULTON WR	7/26/06 8:20	<0.04	0.149	1.11	14	1.6	1.26	2.6	<0.2	<0.2	<0.03	<0.03	0.69	2.39
SACRAMENTO R OPP MOULTON WR	8/22/06 10:50	<0.04	0.081	1.89	8.01	0.67	1.38	2.05	0.21	0.26	<0.03	<0.03	0.55	1.5
SACRAMENTO R OPP MOULTON WR	9/20/06 11:35	<0.04	0.096	2.46	11.8	1.5	1.42	2.26	<0.2	<0.2	<0.03	<0.03	0.54	8.42
SACRAMENTO R OPP MOULTON WR	10/24/06 12:15	<0.04	0.105	2.1	12.3	0.39	1.45	2.03	<0.2	0.21	<0.03	<0.03	0.16	3.21
SACRAMENTO R OPP MOULTON WR	12/12/06 12:35	<0.04	0.264	3.24	22	1.8	2.21	2.82	<0.2	<0.2	<0.03	<0.03	1.65	6.62
SACRAMENTO R OPP MOULTON WR	1/9/07 13:00	<0.04	0.067	2.75	11	1.5	1.08	1.61	<0.2	<0.2	<0.03	<0.03	0.52	3.05
SACRAMENTO R OPP MOULTON WR	2/27/07 10:00	0.254	0.501	10.7	24.6	0.95	2.31	2.83	<0.2	<0.2	<0.03	<0.03	3.33	7.25
SACRAMENTO R OPP MOULTON WR	3/20/07 11:15	<0.04	0.071	2.35	9.98	1.7	0.85	1.21	<0.2	0.31	<0.03	<0.03	0.36	2.78
SACRAMENTO R OPP MOULTON WR	4/18/07 10:15	<0.04	0.078	3.59	11.1	1.3	0.79	1.17	<0.2	<0.2	<0.03	<0.03	0.46	3.33
SACRAMENTO R OPP MOULTON WR	5/30/07 9:00	<0.04	0.147	0.45	12.5	N/A	0.73	1.32	<0.2	<0.2	<0.03	<0.03	0.2	3.66
SACRAMENTO R OPP MOULTON WR	6/27/07 8:00	<0.04	0.092	5.8	12.7	1.1	0.79	1.19	<0.2	<0.2	<0.03	<0.03	0.49	3.4
SACRAMENTO R OPP MOULTON WR	7/19/07 10:05	<0.04	0.066	0.22	8.58	0.98	0.56	1.2	<0.2	<0.2	<0.03	<0.03	0.28	3.2
SACRAMENTO R OPP MOULTON WR	8/28/07 10:40	<0.04	<0.04	0.21	4.92	N/A	0.89	1.02	<0.2	<0.2	<0.03	<0.03	0.46	1.99
SACRAMENTO R OPP MOULTON WR	9/13/07 11:40	<0.04	0.051	0.22	4.64	0.9	0.91	0.95	<0.2	<0.2	<0.03	<0.03	0.46	2.04
SACRAMENTO R OPP MOULTON WR	10/31/07 10:55	<0.04	0.054	0.23	8.41	0.77	1.09	1.2	<0.2	<0.2	<0.03	<0.03	0.31	2.42
SACRAMENTO R OPP MOULTON WR	11/27/07 11:50	<0.04	0.082	0.31	5.67	0.75	0.89	0.92	<0.2	<0.2	<0.03	<0.03	0.29	2.33
SACRAMENTO R OPP MOULTON WR	1/23/08 12:40	<0.04	0.134	1.7	16.3	N/A	1.17	1.49	<0.2	<0.2	<0.03	<0.03	0.77	3.76
SACRAMENTO R OPP MOULTON WR	2/27/08 10:50	<0.04	0.979	0.79	61.7	N/A	1.98	8.93	0.32	0.45	<0.03	<0.03	0.46	11
SACRAMENTO R OPP MOULTON WR	3/26/08 10:10	<0.04	0.061	0.55	11.3	N/A	1	1.13	0.28	0.29	<0.03	<0.03	0.2	2.19
SACRAMENTO R OPP MOULTON WR	4/23/08 10:30	<0.04	0.095	4.21	14.4	N/A	0.92	1.36	<0.2	0.25	<0.03	<0.03	0.66	3.67
SACRAMENTO R OPP MOULTON WR	7/24/08 11:15	<0.04	0.048	0.28	5.01	38	0.65	0.85	0.24	0.28	<0.03	<0.03	0.3	2.53
SACRAMENTO R OPP MOULTON WR	4/22/09 11:10	<0.04	0.057	0.53	9.11	N/A	0.82	0.92	<0.2	0.23	<0.03	<0.03	0.28	2.66
SACRAMENTO R OPP MOULTON WR	5/28/09 12:15	<0.04	0.062	0.41	7.18	N/A	0.78	0.89	<0.2	<0.2	<0.03	<0.03	0.53	2.72
SACRAMENTO R OPP MOULTON WR	6/25/09 9:25	<0.04	0.094	0.33	6.95	N/A	0.93	1.06	0.23	0.26	<0.03	<0.03	0.94	4.54
SACRAMENTO R OPP MOULTON WR	7/28/09 10:30	<0.04	0.062	1.39	7.1	N/A	1.02	1.06	<0.2	<0.2	<0.03	<0.03	0.47	2.72
SACRAMENTO R OPP MOULTON WR	8/27/09 9:30	<0.04	<0.04	0.36	2.63	N/A	0.78	0.86	<0.2	<0.2	<0.03	<0.03	0.33	1.79
SACRAMENTO R OPP MOULTON WR	9/24/09 9:50	<0.04	<0.04	0.33	4.98	N/A	0.84	0.96	<0.2	<0.2	<0.03	<0.03	0.33	1.99
SACRAMENTO R OPP MOULTON WR	10/27/09 11:40	<0.04	0.117	4.35	12.7	N/A	0.94	1.13	<0.2	<0.2	<0.03	<0.03	0.57	2.83
SACRAMENTO R OPP MOULTON WR	11/18/09 11:30	<0.04	0.07	0.44	7.87	N/A	0.89	0.99	<0.2	<0.2	<0.03	<0.03	0.32	2.59
SACRAMENTO R OPP MOULTON WR	12/9/09 8:15	<0.04	<0.04	0.32	7.77	N/A	0.57	0.71	<0.2	<0.2	<0.03	<0.03	0.5	2.41
SACRAMENTO R OPP MOULTON WR	1/26/10 8:45	0.077	4.39	1.92	204	N/A	3.62	25.6	0.23	0.26	<0.03	0.071	0.59	35.9
SACRAMENTO R OPP MOULTON WR	3/2/10 13:15	<0.04	0.604	0.96	45.5	N/A	2.53	4.77	0.24	0.27	<0.03	<0.03	0.84	7.53
SACRAMENTO R OPP MOULTON WR	3/24/10 7:10	<0.04	0.05	0.58	7.08	N/A	0.71	0.8	<0.2	<0.2	<0.03	<0.03	0.23	2.29
SACRAMENTO R OPP MOULTON WR	4/21/10 7:00	0.313	0.56	0.44	37.7	N/A	0.72	4.76	<0.2	0.21	<0.03	<0.03	0.24	7.17
SACRAMENTO R OPP MOULTON WR	5/26/10 7:00	0.048	0.05	0.32	4.64	N/A	0.6	0.73	<0.2	<0.2	<0.03	<0.03	0.42	2.29
SACRAMENTO R OPP MOULTON WR	6/30/10 7:00	<0.04	<0.04	0.28	5.87	N/A	0.73	0.87	<0.2	<0.2	<0.03	<0.03	0.56	2.17
SACRAMENTO R OPP MOULTON WR	7/28/10 8:40	<0.04	0.066	0.33	5.81	N/A	0.86	1.01	<0.2	<0.2	<0.03	<0.03	0.73	2.23
SACRAMENTO R OPP MOULTON WR	8/31/10 10:10	<0.04	0.043	0.5	6.58	N/A	0.8	1.04	<0.2	<0.2	<0.03	<0.03	0.51	1.99
SACRAMENTO R OPP MO														

Table 5. Stone Corral C nr SI, Part 1 of 2

Station Name	Sample Date	Dissolved Aluminum µg/L	Total Aluminum µg/L	Dissolved Arsenic µg/L	Total Arsenic µg/L	Dissolved Boron mg/L	Dissolved Cadmium µg/L	Total Cadmium µg/L	Dissolved Chromium µg/L	Total Chromium µg/L	Dissolved Copper µg/L	Total Copper µg/L	Dissolved Iron µg/L	Total Iron µg/L
STONE CORRAL C NR SI	5/27/98 10:20	N/A	N/A	N/A	N/A	0.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	3/5/01 15:45	N/A	N/A	N/A	N/A	<0.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	4/9/01 9:00	N/A	N/A	N/A	N/A	0.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	2/20/02 11:30	N/A	N/A	N/A	N/A	0.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	3/7/02 9:30	N/A	N/A	N/A	N/A	0.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	3/18/02 11:20	N/A	N/A	N/A	N/A	0.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	4/10/02 16:45	N/A	N/A	N/A	N/A	0.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	5/13/02 8:45	N/A	N/A	N/A	N/A	0.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	12/18/02 15:15	N/A	N/A	N/A	N/A	0.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	1/9/03 12:15	N/A	N/A	N/A	N/A	0.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	1/23/03 10:50	N/A	N/A	N/A	N/A	0.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	2/6/03 10:00	N/A	N/A	N/A	N/A	0.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	3/11/03 14:25	N/A	N/A	N/A	N/A	0.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	3/17/03 11:45	N/A	N/A	N/A	N/A	0.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	4/8/03 13:10	N/A	N/A	N/A	N/A	0.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	4/28/03 11:00	N/A	N/A	N/A	N/A	0.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	5/14/03 12:40	3.68	51.9	1.94	2.34	0.6	0.079	0.03	8.1	6.51	4.46	4.69	<3.31	59.5
STONE CORRAL C NR SI	1/6/04 11:30	143	559	1.4	1.45	0.2	<0.008	<0.016	3.4	3.64	2.25	3.28	92.3	691
STONE CORRAL C NR SI	2/4/04 13:00	1399	2065	1.34	1.46	0.2	<0.011	0.016	2.76	3.06	4.71	4.75	1289	1600
STONE CORRAL C NR SI	2/17/04 13:30	1280	6149	1.26	1.91	<0.1	<0.015	0.025	5.74	11	5.45	14.9	966	7420
STONE CORRAL C NR SI	3/8/04 12:45	42.5	55.5	0.719	0.97	0.3	0.006	0.013	1.62	1.86	1.56	1.95	15.5	59
STONE CORRAL C NR SI	4/7/04 10:15	4.17	49.5	1.01	1.27	0.4	<0.005	<0.006	3.6	3.62	2.36	3.05	<2.76	67.1
STONE CORRAL C NR SI	5/5/04 11:50	1.75	3.71	2.21	2.25	0.6	0.011	0.021	6.05	6.49	3.18	5.24	<3.75	10.5
STONE CORRAL C NR SI	10/5/04 14:30	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	11/8/04 9:50	5.18	19.8	8.84	9.86	1	0.187	0.195	7	7.37	3	2.65	23.9	67.3
STONE CORRAL C NR SI	12/7/04 12:45	21.9	134	5.05	5.2	0.6	0.176	0.36	5.97	8.43	3.75	4.04	1.8	175
STONE CORRAL C NR SI	1/10/05 13:30	458	1369	1.06	1.23	0.2	0.035	0.037	2.74	3.67	2.72	3.74	331	1289
STONE CORRAL C NR SI	2/2/05 10:45	121	182	1.19	1.19	0.3	0.104	0.524	2.72	2.87	1.84	2.04	73.8	178
STONE CORRAL C NR SI	3/10/05 13:00	4.5	23.6	1.19	1.26	<0.1	0.082	0.13	3.28	3.72	1.86	2.21	<3.34	32.1
STONE CORRAL C NR SI	4/19/05 7:20	4.24	4.98	1.25	1.36	0.5	0.028	0.031	4.9	4.92	1.79	2.56	<5.67	<3.58
STONE CORRAL C NR SI	5/19/05 9:50	2.52	6.37	1.65	1.8	0.4	<0.058	<0.015	3.47	4.86	1.93	2.69	<4.53	11.1
STONE CORRAL C NR SI	6/28/05 13:30	4	4.44	2.01	2.57	0.7	0.036	0.04	0.93	4.4	2.21	3.3	10.5	12.2
STONE CORRAL C NR SI	7/24/05 0:00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	8/22/05 0:00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	9/26/05 0:00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	10/24/05 0:00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	11/14/05 9:35	2.27	2.66	8.32	8.66	0.8	<0.009	<0.009	3.76	3.87	4	4.13	76	36.7
STONE CORRAL C NR SI	12/14/05 10:15	2.94	3.44	6.79	7.14	0.7	0.011	0.014	5.15	8.08	1.88	4.38	31.1	43
STONE CORRAL C NR SI	1/24/06 11:45	23.1	28.1	1.76	1.81	0.4	<0.002	<0.002	5.42	5.65	1.65	7.96	14.3	40
STONE CORRAL C NR SI	2/23/06 9:45	7.08	9.09	1.79	1.84	0.5	<0.009	<0.009	7.91	8.93	2.49	2.75	7.9	26.6
STONE CORRAL C NR SI	3/1/06 10:25	1991	2268	1.41	1.49	0.2	0.011	0.051	4.32	4.57	5	5.77	1370	2382
STONE CORRAL C NR SI	4/17/06 8:30	206	265	0.77	0.774	0.2	<0.1	<0.1	1.27	1.42	1.38	1.48	101	236
STONE CORRAL C NR SI	5/17/06 10:00	2.37	4.04	1.75	1.81	0.4	<0.1	<0.1	4.05	4.28	1.78	1.98	9.7	4.3
STONE CORRAL C NR SI	6/27/06 9:00	1.39	34	3.08	3.53	0.6	<0.1	<0.1	1.05	1.48	1.26	1.99	22.9	70.8
STONE CORRAL C NR SI	7/26/06 0:00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	10/24/06 0:00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	12/12/06 10:30	135	598	6.74	9.96	0.8	<0.1	<0.1	5.1	9.05	4.32	5.1	53.2	222
STONE CORRAL C NR SI	1/9/07 11:30	11.1	74.1	5.49	5.7	0.7	<0.1	<0.1	4	4.83	1.82	1.94	42.7	117
STONE CORRAL C NR SI	2/27/07 8:30	34.6	36.9	3.41	3.86	0.6	<0.1	<0.1	0.98	1.69	3.9	3.96	57.9	81.1
STONE CORRAL C NR SI	3/20/07 9:50	5.74	64.1	3.26	3.49	0.7	<0.1	<0.1	0.66	1.03	1.1	1.35	61.1	215
STONE CORRAL C NR SI	4/18/07 8:00	4.48	16.4	4.19	4.38	0.7	<0.1	<0.1	0.93	0.97	0.69	0.83	47.3	89.4
STONE CORRAL C NR SI	5/30/07 0:00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	8/28/07 0:00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	9/13/07 0:00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	10/31/07 0:00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	1/23/08 11:30	9.77	3188	1.41	2.23	0.1	<0.1	<0.1	0.41	8.39	5.11	10.8	42.3	3247
STONE CORRAL C NR SI	2/27/08 10:05	1.94	770	1.12	1.4	0.2	<0.1	<0.1	0.23	1.87	2.49	3.5	4.1	634
STONE CORRAL C NR SI	3/26/08 9:10	0.94	33.5	1.57	2.15	0.4	<0.1	<0.1	0.36	0.49	2.97	3.01	2.7	62.7
STONE CORRAL C NR SI	4/23/08 9:50	1.73	50.6	2.63	2.97	0.6	<0.1	<0.1	0.53	0.55	3.82	3.86	7.9	78.1
STONE CORRAL C NR SI	7/23/08 0:00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	4/22/09 0:00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	5/28/09 0:00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	6/25/09 0:00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	7/28/09 0:00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	8/27/09 0:00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	9/24/09 0:00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	10/21/09 0:00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	11/18/09 0:00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	12/9/09 0:00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	1/26/10 10:45	27.1	3100	0.682	1.52	0.1	<0.1	<0.1	0.26	7.11	3.01	5.95	54.4	48.5
STONE CORRAL C NR SI	3/2/10 12:20	3.34	960	1.16	1.45	0.2	<0.1	<0.1	0.27	2.29	2.85	4.4	11.3	854
STONE CORRAL C NR SI	3/24/10 9:05	0.66	8.66	1.85	1.87	0.5	<0.1	<0.1	0.43	0.47	2.34	2.51	3	10.2
STONE CORRAL C NR SI	4/21/10 9:00	3.61	1.75	0.961	1.12	0.4	<0.1	<0.1	0.48	0.73	2.21	2.86	3.8	229
STONE CORRAL C NR SI	5/26/10 8:50	1.45	1.46	4.07	4.12	0.6	<0.1	<0.1	0.62	0.68	2.28	2.39	1.4	5.1
STONE CORRAL C NR SI	6/29/10 0:00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	8/31/10 0:00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	10/26/10 0:00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	11/30/10 10:30	2.35	6.7	6.04	6.24	0.8	<0.1	<0.1	2.2	2.44	2.79	3.04	9.4	48.4
STONE CORRAL C NR SI	12/13/10 10:10	1.23	2.25	6	6.22	0.7	<0.1	<0.1	3.55	3.73	4.11	4.22	5.2	19.6
STONE CORRAL C NR SI	1/18/11 12:25	3.06	105	2.07	2.14	0.4	<0.1	<0.1	0.74	0.91	2.82	2.99	9.7	131
	Maximum	1991	6149	8.84	9.96	1	0.187	0.524	8.1	11	5.45	14.9	1370	7420
	Median	4.36	50.05	1.775	2.025	0.5	0.0355	0.034	2.75	3.095	2.49	3.14	23.15	70.5
	Minimum	0.66	1.46	0.682	0.774	0.1	0.006	0.013	0.2	0.47	0.69	0.83	9.7	4.3
SWRCB Basin Plan - Drinking Water Standards-Primary MCL		1000												
SWRCB Basin Plan - Drinking Water Standards-Secondary MCL		200												
Cal EPA/OEHHA - California Public Health Goal		600		0.004			0.04						300	
USEPA Secondary MCL														
Cal EPA - One in a million incremental cancer risk estimate for drinking water				0.023			0.0023							
USEPA Health Advisory for drinking water		50		0.02										
California Proposition 65 Safe Harbor Level - Max. Allowable dose level for reproductive toxicity				0.05										
California Toxics Rule Sources of Drinking Water														
California Toxics Rule Freshwater Aquatic Life Protection Continuous Concentration														
California Toxics Rule Freshwater Aquatic Life Protection Maximum Concentration														
Agriculture Water Quality Goals - Taste and odor threshold				100		0.7							5000	
California Notification Level - Drinking Water						1								
National Academy of Sciences Health Advisory for Drinking Water		5000												
USEPA 'RIS Reference Dose Drinking Water Health Advisory				2.1										
National Recommended WQ Criteria - Taste and Odor or Welfare														

Table 5: Stone Corral Cnr SI, Part 2 of 2

Station Name	Sample Date	Dissolved Lead µg/L	Total Lead µg/L	Dissolved Manganese µg/L	Total Manganese µg/L	Total Mercury ng/L	Dissolved Nickel µg/L	Total Nickel µg/L	Dissolved Selenium µg/L	Total Selenium µg/L	Dissolved Silver µg/L	Total Silver µg/L	Dissolved Zinc µg/L	Total Zinc µg/L
STONE CORRAL C NR SI	5/27/98 10:20	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	3/5/01 15:45	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	4/9/01 9:00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	2/20/02 11:30	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	3/7/02 9:30	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	3/18/02 11:20	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	4/10/02 16:45	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	5/13/02 8:45	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	12/18/02 15:15	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	1/9/03 12:15	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	1/23/03 10:50	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	2/6/03 10:00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	3/11/03 14:25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	3/17/03 11:45	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	4/8/03 13:10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	4/28/03 11:00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	5/14/03 12:40	0.058	0.042	0.17	9.03	N/A	2.57	3.14	7.33	7.37	0.131	<0.197	0.86	1.25
STONE CORRAL C NR SI	1/6/04 11:30	0.036	0.256	9.48	42.9	N/A	2.32	3.56	3.02	3.07	<0.007	<0.014	0.46	2.74
STONE CORRAL C NR SI	2/4/04 13:00	0.266	0.507	13.1	32.3	N/A	3.27	3.79	0.66	1.25	<0.001	0.207	4.24	5.21
STONE CORRAL C NR SI	2/17/04 13:30	0.782	2.91	36.1	203	N/A	3.58	15.8	0.26	0.38	<0.016	0.056	4.53	24.9
STONE CORRAL C NR SI	3/8/04 12:45	0.009	0.094	1.66	3.57	N/A	2.11	2.32	1.34	2.38	0.054	0.09	0.82	1.05
STONE CORRAL C NR SI	4/7/04 10:15	0.05	0.065	1.15	4.6	N/A	2.4	2.58	4.26	4.48	0.03	<0.031	1.3	1.65
STONE CORRAL C NR SI	5/5/04 11:50	0.035	0.038	0.85	2.41	N/A	2.82	2.85	8.2	8.22	0.09	<0.044	1.38	1.4
STONE CORRAL C NR SI	10/5/04 14:30	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	11/8/04 9:50	0.059	0.142	27.2	43.1	N/A	4.98	9.72	30	30.4	0.082	0.107	1.78	1.81
STONE CORRAL C NR SI	12/7/04 12:45	0.244	0.293	1.07	30.6	N/A	3.29	3.49	10.5	10.6	0.05	0.086	0.99	1.44
STONE CORRAL C NR SI	1/10/05 13:30	0.111	0.428	2.61	32.1	N/A	2.24	3.48	1.69	1.84	0.009	0.015	1.46	4.64
STONE CORRAL C NR SI	2/2/05 10:45	0.095	0.117	7.35	19.8	N/A	2.15	2.63	2.32	2.87	0.004	0.007	0.99	1.45
STONE CORRAL C NR SI	3/10/05 13:00	0.05	0.057	1.17	6.21	N/A	1.53	2.29	3	3	<0.001	<0.036	0.73	3.86
STONE CORRAL C NR SI	4/19/05 7:20	0.054	0.147	2.44	3.02	N/A	2.12	2.15	4.22	5.06	<0.003	<0.005	0.81	0.88
STONE CORRAL C NR SI	5/19/05 9:50	0.006	0.038	0.73	2.12	N/A	1.43	2.09	4.07	4.46	<0.009	0.021	0.7	0.74
STONE CORRAL C NR SI	6/28/05 13:30	0.094	0.099	2.4	6.88	N/A	1.96	2.45	5.68	5.9	0.05	0.173	0.91	1.72
STONE CORRAL C NR SI	7/24/05 0:00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	8/22/05 0:00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	9/26/05 0:00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	10/24/05 0:00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	11/14/05 9:35	0.007	0.008	20.3	21.2	N/A	7.73	8.27	20.6	20.7	<0.009	<0.009	1.55	1.57
STONE CORRAL C NR SI	12/14/05 10:15	0.008	0.014	17.1	19	N/A	8	8.64	21.4	22.6	<0.001	0.041	1.04	1.36
STONE CORRAL C NR SI	1/24/06 11:45	0.013	0.021	29.4	32.6	N/A	3.34	3.9	5.53	5.63	<0.005	0.011	0.84	0.87
STONE CORRAL C NR SI	2/22/06 9:45	<0.045	0.009	8.96	13.9	N/A	3.57	3.39	6.31	7.05	<0.009	<0.009	0.91	1.03
STONE CORRAL C NR SI	3/1/06 10:25	0.536	1.38	29.8	46.9	N/A	4.79	5.55	0.8	1.06	<0.009	<0.009	6.47	7.11
STONE CORRAL C NR SI	4/17/06 8:30	0.054	0.089	9.99	14.1	N/A	2.65	3.23	1.75	1.99	<0.03	<0.03	1.27	1.61
STONE CORRAL C NR SI	5/17/06 10:00	<0.04	<0.04	1.65	1.73	N/A	1.59	1.98	5.38	5.93	<0.03	<0.03	0.9	0.93
STONE CORRAL C NR SI	6/27/06 9:00	<0.04	<0.04	8.27	39.4	N/A	2.15	3.46	3.58	3.97	0.087	0.165	0.6	0.64
STONE CORRAL C NR SI	7/26/06 0:00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	10/24/06 0:00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	12/12/06 10:30	<0.04	0.122	18.5	71.3	N/A	4.37	6.92	15.6	21.8	<0.03	<0.03	0.79	3.78
STONE CORRAL C NR SI	1/9/07 11:30	0.2	0.215	32.8	80.2	N/A	3.07	3.23	19.6	20.6	<0.03	<0.03	1.04	2.53
STONE CORRAL C NR SI	2/27/07 8:30	0.05	0.121	28	29.3	N/A	2.59	3.79	9.75	13.7	<0.03	<0.03	1.32	3.01
STONE CORRAL C NR SI	3/20/07 9:50	<0.04	0.062	35.3	89.4	N/A	1.2	1.44	6.1	7.26	<0.03	<0.03	0.97	2.79
STONE CORRAL C NR SI	4/18/07 0:00	0.06	0.068	25.6	41.4	N/A	2.3	1.3	1.38	5.73	<0.03	<0.03	1.03	2.42
STONE CORRAL C NR SI	5/30/07 0:00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	8/28/07 0:00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	9/13/07 0:00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	10/31/07 0:00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	1/23/08 11:30	0.06	2.04	2.41	92.6	N/A	3.43	9.39	0.65	0.9	<0.03	0.033	0.5	16.3
STONE CORRAL C NR SI	2/27/08 10:05	<0.04	0.272	0.54	30.8	N/A	1.66	2.46	2.2	2.5	<0.03	<0.03	0.64	4.66
STONE CORRAL C NR SI	3/26/08 9:10	<0.04	0.064	1.63	27.9	N/A	2.13	3.1	3.53	4.02	<0.03	<0.03	0.8	2.42
STONE CORRAL C NR SI	4/23/08 9:50	0.046	0.059	8.33	19.1	N/A	3.77	3.86	9.54	9.75	<0.03	<0.03	1.28	2.94
STONE CORRAL C NR SI	7/23/08 0:00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	4/22/09 0:00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	5/28/09 0:00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	6/25/09 0:00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	7/28/09 0:00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	8/27/09 0:00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	9/24/09 0:00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	10/23/09 0:00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	11/18/09 0:00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	12/9/09 0:00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	1/26/10 10:45	<0.04	1.91	1.52	106	N/A	4.36	8.87	0.59	0.63	<0.03	<0.03	0.86	16.1
STONE CORRAL C NR SI	3/2/10 12:20	<0.04	0.438	0.69	46.6	N/A	2.29	2.98	2.02	2.54	<0.03	<0.03	1.08	5.48
STONE CORRAL C NR SI	3/24/10 9:05	<0.04	<0.04	2.65	14.4	N/A	1.57	2.33	4.97	5.56	<0.03	<0.03	1.04	2.44
STONE CORRAL C NR SI	4/21/10 9:00	<0.04	0.087	1.64	12.6	N/A	1.51	1.98	2.93	3	<0.03	<0.03	1.06	2.7
STONE CORRAL C NR SI	5/26/10 8:50	<0.04	<0.04	0.14	1.34	N/A	2	2.06	4.31	4.4	<0.03	<0.03	1.85	2.52
STONE CORRAL C NR SI	6/29/10 0:00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	8/31/10 0:00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	10/26/10 0:00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STONE CORRAL C NR SI	11/30/10 10:30	<0.04	<0.04	63.4	75.9	N/A	2.04	2.1	1.36	1.42	<0.03	<0.03	2.7	3.76
STONE CORRAL C NR SI	12/13/10 10:10	<0.04	<0.04	0.29	16	N/A	1.93	2.61	1.74	1.88	0.089	0.12	2.17	2.5
STONE CORRAL C NR SI	1/18/11 12:25	<0.04	0.057	38.2	78.8	N/A	1.25	1.72	3.43	3.5	0.064	0.347	1.42	1.79
	Maximum	0.782	2.91	63.4	203	2.3	8	15.8	30	30.4	0.131	0.347	6.47	24.9
	Median	0.054	0.0965	5	28.6	0.92	2.305	3.12	4.145	4.43	0.059	0.086	1.035	2.43
	Minimum	0.006	0.008	0.14	1.34	0.29	1.2	1.38	0.26	0.38	0.004	0.007	0.46	0.64

SWRCB Basin Plan - Drinking Water Standards - Primary MCL  
 SWRCB Basin Plan - Drinking Water Standards - Secondary MCL  
 Cal EPA CDPHS - California Public Health Goal  
 USEPA Secondary MCL  
 Cal EPA - One in a million incremental cancer risk estimate for drinking water  
 USEPA Health Advisory for drinking water  
 California Proposition 65 Safe Harbor Level - Max. Allowable dose level for reproductive toxicants  
 California Toxics Rule Freshwater Aquatic Life Protection - Continuous Concentration  
 California Toxics Rule Freshwater Aquatic Life Protection - Maximum Concentration  
 Agriculture Water Quality Goals - Taste and odor threshold  
 California Notification Level - Drinking Water  
 National Academy of Sciences Health Advisory for Drinking Water  
 USEPA IRIS Reference Dose Drinking Water Health Advisory  
 National Recommended WQ Criteria - Taste and Odor or Welfare  
 National Recommended WQ Criteria - Human Health and Welfare protection - water and  
 National Recommended WQ Criteria - Freshwater Aquatic Life Continuous Concentration  
 National Recommended WQ Criteria - Freshwater Aquatic Life Maximum Concentration

The Draft EIR is an improvement from the 2017 version in that it at least acknowledges some water quality issues, but continues to ignore other water quality issues, makes inaccurate and misleading statements, and offers conflicting and contradicting strategies to attempt to lessen significant and substantial adverse impacts.

The data in the WDL for the Sacramento River and Cottonwood Creek demonstrate that high concentrations of metals can be expected during the high flow months of winter (December through March) when diversions would be occurring to the proposed Sites Reservoir. Higher concentrations of metals are likely during the higher flows that can occur during these months. Such higher flows were not targeted by the limited sampling effort presented in the WDL. The high concentrations of metals in the source water will adversely impact water quality in the proposed reservoir for most, if not all, the proposed beneficial uses of the stored water.

Some metals from both the Sacramento River and Cottonwood Creek, whose concentrations did not exceed criteria in the limited sampling effort, had concentrations that nearly exceed the criteria and standards. These and other metals whose concentrations did not exceed the criteria may have higher concentrations during the higher flow periods that the proposed project would be diverting. Again, these higher flow periods were not targeted during the limited sampling effort.

Even some of the minimum concentrations of metals found in the source waters exceed criteria and standards, which means that the source waters never meet these goals and standards – the criteria are always exceeded and the water is never suitable for the beneficial use or uses the criteria or standards were designed to protect. Water quality in the proposed reservoir for these parameters will exceed the criteria and standards all the time.

Since water quality in the proposed reservoir will reflect that of the source waters, the reservoir will have concentrations of numerous metals, including aluminum, arsenic, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel, selenium, silver, and zinc, that exceed a number of criteria and standards developed to protect beneficial uses. In addition, other metals that may not exceed criteria and standards in the source waters may adversely affect reservoir water quality due to synergistic effects. The State Water Resources Control Board (SWRCB 2011) states that “when multiple constituents have been found together in groundwater or surface waters, their combined toxicity should be evaluated” and that “theoretical risks from chemicals found together in a water body shall be considered additive for all chemicals having similar toxicologic effects or having carcinogenic effects.” Thus, the adverse effects from the metals delivered to the proposed reservoir from the source waters may have an even greater adverse impact and pose an unacceptable level of risk. Beneficial uses potentially impacted by metals in the proposed reservoir include agricultural water supply (direct toxicity or uptake by crops making the crops unsuitable for use), wildlife (such as fish-eating birds), fisheries, recreation (including sport fishing and water contact activities such as swimming), and drinking water supplies for communities that divert water from the Sacramento River.

Releases from the proposed reservoir would occur during the summer when metals concentrations in the Sacramento River are much lower due to the majority of flow being from Shasta Reservoir, with much better water quality, though still carrying a metals load. High

metals concentrations in the proposed reservoir releases could adversely affect water quality in the Sacramento River during the summer months by increasing metals loads beyond acceptable limits and adversely impact beneficial uses.

Though high concentrations of metals that exceed water quality criteria exist in source waters to the proposed project, they cannot be regulated by governmental entities since they are natural occurrences. However, once contained artificially in a reservoir, they are subject to jurisdictional control by regulatory agencies. Any releases of water from the proposed reservoir will likely be subject to review by water quality regulatory agencies to ensure that such releases do not adversely affect downstream resources due to the heavy metals loads in the releases. The SWRCB has an antidegradation policy that prohibits discharges that would degrade water quality to a level below water quality objectives because no capacity would exist for degradation that will be caused by the next downstream or downgradient uses – the ability to beneficially use the water would have been impaired, even though water quality objectives would not yet have been exceeded (SWRCB 2011). The contribution of additional metal loads from releases from the proposed Sites Reservoir during the summer could cause concentrations of metals in the Sacramento River to exceed criteria and standards or at least be subject to the antidegradation policy due to an incremental increase in metals in the Sacramento River from the proposed project. Thus, the proposed project may face prohibition of releases if stored water does not meet water quality criteria or standards or if releases can cause criteria or standards to be exceeded by downstream inputs (i.e., antidegradation policy).

During dry years, the adverse impacts associated with the project can be expected to be even greater. Flows in the Sacramento River from upstream reservoirs on the Sacramento River (i.e., Shasta Reservoir, Whiskeytown Reservoir) will be minimized during the winter months in an effort to restore water storage levels in those reservoirs. Likewise, during wet or even normal runoff years, releases from the upstream reservoirs during the winter will be curtailed during high runoff periods to prevent downstream flooding. In any of these scenarios, tributary influences, such as Cottonwood Creek, on water quality in the Sacramento River will be much greater. The proposed project would still attempt to capture as much runoff from the Sacramento River as possible, but the water diverted to the proposed project will have even greater concentrations of metals due to the majority of flow being from tributary streams (e.g., Cottonwood Creek) during dry and possibly even wet or normal runoff years.

Similarly, during the summer in dry years, releases from upstream reservoirs (i.e., Shasta Reservoir, Whiskeytown Reservoir) will be minimized. Releases to the Sacramento River from the proposed project (whether directly to the Sacramento River or indirectly through the CBD or GCID) will have a greater impact on water quality in the Sacramento River due to less dilution being available due to curtailed flows in the river from upstream reservoirs (i.e., Shasta and Whiskeytown reservoirs).

The limited data that are available are sufficient to show that water quality in the proposed reservoir will have concentrations of a large number of metals that exceed many water quality criteria and standards, including those established for the protection of agricultural water supply, wildlife and fisheries, and drinking water. Metals bioaccumulation in the reservoir food web could produce adverse impacts to fish-eating birds and other animals, as well as humans, and

adversely affect any potential recreational benefit from the project. Releases from the proposed reservoir could adversely affect downstream resources, including agricultural water supply, wildlife and fisheries, and drinking water supplies for communities that divert water from the Sacramento River.

The Basin Plan lists other chemicals that adversely affect water quality in the Sacramento River, including chlorpyrifos and diazinon. The California State Water Resources Control Board lists a number of other “constituents of concern” in the study area, including chlordane, DDT, mercury, PCBs, and dieldrin. In addition, sewer outfalls from the cities of Redding and Red Bluff contribute other contaminants, such as pharmaceuticals, to the Sacramento River. Other than diazinon and a brief discussion of chlorpyrifos, DDT, and dieldrin, no information is provided in the EIR about effects to the proposed project from these chemical contaminants.

## Chapter 6. Surface Water Quality

p. 6-2 and 6-3: Table 6-1b summarizes operation impacts for surface water quality resources. Impact WQ-2 (Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface water quality during operation) is identified as CEQA significant and unavoidable (SU) and NEPA substantial adverse effect (SA) for all alternatives. Yet, somehow this is deemed as not conflicting with or obstructing implementation of a water quality control plan (Impact WQ-5). Since, as identified as Impact WQ-2, the project will violate water quality standards of the Central Valley Water Quality Control Plan (Basin Plan), this is obviously a significant impact and substantial adverse effect which conflicts with the Basin Plan.

p. 6-19: “Mean mercury concentrations in Shasta Lake and in the Sacramento River at Red Bluff and Hamilton City are substantially lower than the CTR criterion for mercury in freshwater (50 nanograms per liter [ng/L]).” The Sites Reservoir project will not be diverting “mean” concentrations of mercury (or any other constituent), but rather the higher concentrations of constituents generally associated with the higher flows from which the project will be diverting. In the Sacramento River at Hamilton City, Table 6-5 shows that total mercury concentrations have been measured as high as 54 ng/L, which are higher than the CTR criterion of 50 ng/L, and raise concern for significant and substantial adverse effects when waters with these types of concentrations are diverted into the reservoir.

Table 6-5 also shows that total mercury concentrations have been measured as high as 14.4 ng/L in the Sacramento River at Red Bluff but only 0.52 ng/L in Lake Oroville. Yet these relatively low concentrations of total mercury from the water in Lake Oroville have been sufficient to cause fish from this reservoir to exceed the numeric criterion and objectives for all trophic levels of fish, including both sport and prey fish, for the protection of human health and wildlife as contained in the Sacramento–San Joaquin River Delta Estuary TMDL for Methylmercury and Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California—Tribal and Subsistence Fishing Beneficial Uses and Mercury Provisions. Fish tissue concentrations as high as 0.7 mg/kg have been found in fish from Lake Oroville (DWR 2007). Since mercury concentrations of up to only 0.52 ng/L in Lake Oroville have been sufficient to cause numeric criterion and objectives to be exceeded in this reservoir, concentrations of

mercury as high as 14.4 ng/L in water diverted to the proposed reservoir from the Sacramento River at Red Bluff will undoubtedly cause highly significant impacts and substantial adverse effects in the proposed reservoir and in downstream releases.

The DEIR on page 6-17 states that “in newly constructed reservoirs, the initial inundation of soils and vegetation can cause higher net methylmercury production in early years after filling, when organic carbon is relatively abundant, relative to long-term average production. This initial spike in mercury methylation can increase the concentrations of water column methylmercury to double or triple the long-term average concentrations for up to 10 years.” It also states that “the literature suggests that fish tissue concentrations of methylmercury may peak 3–8 years after filling, with concentrations slowly declining to a lower steady-state after 10–35 years.” The data from Lake Oroville (which is over 50 years old) shows that even if the expected initially high mercury concentrations in the reservoir decline over time, the concentrations of mercury present in water that would be diverted to the reservoir from the Sacramento River at Red Bluff and especially at Hamilton City are sufficiently high to cause fish tissue methylmercury concentrations to exceed criterion for the protection of human health and wildlife, not just for 10 to 35 years, but for the life of the reservoir project.

The DEIR states on page 6-22 states that “the effects of mixtures of metals on organisms in the Sacramento River are poorly understood.” Nonetheless, the SWRCB states that when multiple constituents are found together, the combined toxicity of the multiple constituents should be evaluated. “In the absence of scientifically valid data to the contrary, Section 2550.4(g) of Chapter 15, Article 5 regulations referenced in the SWRCB’s Site Investigation and Cleanup Policy requires that theoretical risks from chemicals found together in a water body shall be considered additive for all chemicals having similar toxicological effects or having carcinogenic effects. This requirement is also found in the California hazardous waste management regulations (Title 22 of CCR, Section 66264.94(f) and in the USEPA Risk Assessment Guidance for Superfund (RAGS).” This DEIR did not consider the combined effects of metals and is therefore deficient.

The DEIR states on page 6-22 that metal concentration measurements are shown in Appendix 6E but that “this is not an exhaustive presentation of all measurements, but instead is provided to show patterns of metal concentrations at the Sites Reservoir intake locations (near Red Bluff and Hamilton City), in the CBD, and upstream of one of the potential release locations (upstream of the CBD).” The DEIR should not selectively filter the available data in order to support its contentions, but should show all data even though the data may prove contentions incorrect.

The DEIR states on page 6-23 that “for most metals there is little difference in concentration between upstream and downstream locations on the Sacramento River.” This is not true at all. Data in WDL show substantial differences between upstream and downstream locations. For example, comparing the data for the Sacramento River at Keswick to that at Red Bluff show total aluminum as 492 ug/L vs. 3,630 ug/L, total copper as 4 ug/L vs. 14.7 ug/L, total iron as 294 ug/L vs. 4,160 ug/L, and total lead as 1.56 ug/L vs. 3.14 ug/L, all substantial differences. The differences in concentrations for these and other constituents is attributed to tributary stream inflows, with the most significant in terms of both flow and contribution of these constituents being Cottonwood Creek.

The DEIR states on page 6-31 that “contaminated sediments could move into Sites Reservoir as suspended sediments during high flows, but the main supplies of contaminated sediments and their potential effects would remain in the Sacramento River channel because the amount of sediment contained in the diversions to Sites Reservoir would be small compared to what is contained in the Sacramento River channel.” The concentration of contaminated or suspended sediments would be exactly the same in the water diverted to Sites Reservoir and that in the Sacramento River at the point and time of diversion – there is no difference in sediment load. The only difference is that the Sacramento River will carry a substantially greater load of sediment due to the substantially greater flow in the Sacramento River than the amount of water diverted to the proposed reservoir.

The DEIR states on page 6-31 that “wind, rain, and wave action commonly erode bare soil adjacent to reservoirs and could cause erosion along the edge of Sites Reservoir when it is not full. These phenomena may temporarily increase turbidity along the reservoir’s edge prior to settling of the sediment, but this increase would not markedly affect beneficial uses of the reservoir (i.e., recreation, water supply, fisheries and wildlife).” Erosion of soils in the exposed inundation zone will re-suspend soils laden with metals and other contaminants, which may then contribute to impacts in the reservoir or downstream releases.

Page 6-33 states that “when Sites Reservoir would release water to the Sacramento River, it would constitute 6%–7% of the Sacramento River flow on average and 12%–13% when discharges are relatively high compared to river flow,” and therefore “water quality in Sites Reservoir would have limited effect on the water quality in the Sacramento River.” However, page 6-32 states that evapoconcentration could increase constituent concentrations in Sites Reservoir by up to 48%. Therefore, water released from Sites Reservoir to the Sacramento River could contribute higher concentrations of constituents such as metals. The DEIR does not evaluate the effects from these higher concentrations on water quality and beneficial uses of the Sacramento River. Also, during “operational exchanges” when additional water is released from Sites Reservoir and water is held back in Shasta or Oroville reservoirs, the percent of water from Sites Reservoir constituting the total flow in the Sacramento River will be increased, potentially adversely affecting water quality in the river and impacting downstream water users.

Page 6-37 discusses Harmful Algal Blooms in relation to “whether cyanobacteria and cyanotoxins may be released from the reservoir with dead pool withdrawals” and “the elevation of the low-level intake from which dead pool withdrawals would be released.” “Dead pool” usually refers to water in a reservoir that cannot be drained by gravity through a dam’s outlet works. How is the project planning on withdrawing water from the dead pool?

Page 6-42 states that the “metals analysis relies on best available data provided by DWR’s WDL” and that “these data were collected intermittently over multiple years, with measurements representing a wide range of flow conditions.” This is not true. The statement of “best available data” is an attempt to portray the WDL data as robust, which it is not. While the data were collected “intermittently over multiple years,” the data are better described as “spotty.” Sample collection for this sparse data did not target a “wide range of flow conditions,” but rather were based on a fixed schedule regardless of flow conditions. The metals data from DWR’s Water Data Library (WDL) “provide a general understanding of how metal and pesticide concentrations

may vary with flow and location, allow the identification of trends, and support the impact analysis and conclusion.” Water quality data in the WDL for diversion locations of the project are extremely limited. From the Sacramento River below the Red Bluff Diversion Dam, only 26 samples were collected by DWR between the years of 2000 and 2020 (Table 1) during the project’s primary months of diversion to storage (January through March, p. 6-32). In eight of the 20 years of data collection from this monitoring station, only one sample was collected during the primary months of diversion to storage; only two years saw four samples collected (both were drought years); in the remaining years only two to three samples were collected during the months of January through March. This pattern of data collection is even more sparse for the Sacramento River at Hamilton City (Table 2). Only 20 samples were collected from the Hamilton City monitoring site during the project’s primary months of diversion to storage. Only one sample was collected from this site in 10 of the 20 years of data collection; three samples were collected in two of the monitoring years, and four samples were collected in one year (which was a drought year). This scant yearly data collection does not “provide a general understanding of how metal and pesticide concentrations may vary with flow and location, allow the identification of trends, and support the impact analysis and conclusion.” Collection of these 26 samples was not timed to address variations in concentrations due to variations of flow, but were grab samples collected on a more or less set schedule without the intent to provide sufficient data for impact analysis for any type of storage project. Concentrations of many of the metals analyzed from these samples were found to be higher when flows were higher during sample collection. However, variation in concentrations due to flow was not considered during sample collection, and even higher concentrations of metals may be found with flows higher than those during the limited sample collection.

The project proposes to collect additional samples for metals at a frequency sufficient to better understand the relationship with variations in flow, but this is only after the project has been constructed. These post-project data would “refine the understanding of metals as more data would likely improve the accuracy of equations used in this analysis for estimating metal concentrations,” which is commendable but too late to better understand the adverse effects prior to construction of the project. The project proponents have been pursuing this project for over 20 years. They were also made aware of water quality issues related to this project from comments on the 2017 DEIR, providing ample time for additional data collection to further elucidate the issues prior to preparation of the current DEIR, but no data were collected by the project proponents. Failing this, now they propose to collect this needed data but only after the project is completed to determine the severity of the problems. This is backwards. CEQA requires impact analysis prior to approval and construction of a project, not afterwards. This project should not be constructed and then data collected to see if it will work or to determine the adverse impacts, but rather data should be collected and evaluated prior to approval of this project to determine adverse impacts and potential mitigation.

Based on the limited available data, the project focuses on only four metals (aluminum, copper, iron, and lead) considered to be of greatest concern due to seasonal changes in concentration and concentrations above standards (p. 6-42). The only “standards” considered are a “California MCL,” “California Secondary MCL,” and Freshwater Chronic Standard for Aquatic Life Protection. There are a large number of other numeric water quality thresholds applicable to this project, including California and Federal Drinking Water Standards (MCLs), California Public

Health Goals (PHGs), California State Notification and Response Levels for Drinking Water, Suggested No-Adverse-Response Levels (SNARLs), Cancer Risk Estimates, Health-based criteria from USEPA Integrated Risk Information System (IRIS), Proposition 65 Safe Harbor Levels, California Toxics Rule Criteria to Protect Human Health and Aquatic Life, USEPA Recommended Criteria to Protect Human Health and Aquatic Life, Agricultural Use Protective Limits, and Taste and Odor Based Criteria. These assessment thresholds have been summarized by the SWRCB and are presented below in Tables 3 and 4. These are the thresholds to which the proposed project should be compared, but apparently not utilized in the DEIR analyses.

In addition to the four metals considered in the DEIR, arsenic, cadmium, manganese, nickel, and zinc concentrations in water from the Sacramento River below the Red Bluff Diversion Dam as well as at Hamilton City exceed various criteria (Tables 3 and 4). The tables also show potential metal concentrations in Sites Reservoir due to evapoconcentration, as discussed on page 6-32 of the DEIR.

Cottonwood Creek is the main tributary contributor to winter flows in the Sacramento River at Red Bluff and is primarily responsible for elevated metals concentrations in the river. As an example of the influence of Cottonwood Creek on metals concentrations in the Sacramento River at Red Bluff, on March 1, 2006 when the total aluminum concentration in Cottonwood Creek was measured as 3,739 ug/L, the concentration in the Sacramento River was 2,240 ug/L (Table 5). But, similar to previous monitoring in the Sacramento River, monitoring of Cottonwood creek did not target higher flows and even higher concentrations of metals are likely to be found with the higher flows. Nor did monitoring in Cottonwood Creek always coincide with sample collection in the Sacramento River. For example, on May 5, 2005, a total aluminum concentration of 14,345 ug/L was analyzed from Cottonwood Creek, but no corresponding sample was collected from the Sacramento River. Estimating the total aluminum concentration using the concentration reported from Cottonwood Creek multiplied by the ratio of concentrations in the Sacramento River and Cottonwood Creek ((Cottonwood Cr) x (Sacramento River/Cottonwood Creek)) from March 1, 2006 yields an estimated concentration in the Sacramento River of 8,594 ug/L for May 5, 2005. This total aluminum concentration is much higher than the few measured analyses from the Sacramento River, and serves to reiterate the likelihood that even higher concentrations of metals would undoubtedly be found with more frequent monitoring and targeting of higher flows, which are the flows that would be diverted to the proposed reservoir. This same relationship applies to other metals and demonstrates that the analysis in the DEIR was not “conservative” but used the little available data to underestimate metal concentrations likely to occur. Since the project proponents have failed to collect any water quality data in the 20 years they have been promoting this project, using data projections such as that discussed above is the most appropriate measure to arrive at a reasonable evaluation.

The concentration of metals in Sites Reservoir was then calculated using the projected maximum Sacramento River concentration and applying the 48 percent evapoconcentration factor described in the DEIR. Using the “conservative” approach of the DEIR, the projected metals concentrations in the Sacramento River at Hamilton City during the May through September release period was next calculated using the maximum metal concentrations in the Sacramento River at Hamilton City (from WDL). The projected metals concentrations in the river at Hamilton City were calculated using 13 percent of the Sites Reservoir concentration after

evapoconcentration (Table 5) and 87 percent of the Sacramento River at Hamilton City concentration (WDL). The Sacramento River at Hamilton City site was used with the assumption that water quality in the river at Hamilton City would be similar to downstream water quality near Dunnigan, the river release site for Alternative 2. The projected metals concentrations in the Sacramento River at Hamilton City, even with dilution of Sites Reservoir releases with Sacramento River water, exceed various water quality objectives or promulgated criteria (Table 6).

Similar results can be expected for discharges from Sites Reservoir to the Colusa Basin Drain. Table 6 shows that concentrations of metals in the CBD, when mixed with 13 percent of water from Sites Reservoir and assuming average metal concentrations in the CBD (p. 6E-10), exceed water quality objectives or promulgated criteria for aluminum, arsenic, copper, iron, lead, manganese, and nickel. Introduction of water from Sites Reservoir to the CBD results in even higher concentrations in the CBD of most metals, including aluminum, cadmium, chromium, copper, iron, lead, manganese, nickel, selenium, and zinc.

The “evaluation of concentration assuming no settling of suspended sediment” starting on page 6-44 used data from the “November–May period of higher flows and concentrations to better focus on the range of flows that may occur when Sacramento River water would be diverted to Sites Reservoir.” This is inconsistent with other statements in the DEIR that state that the project’s primary months of diversion to storage would be January through March (page 6-32).

The DEIR states the settling of sediment entering the reservoir would substantially reduce the concentration of metals (page 6-45). Though settling of sediment (and organic matter) entering the reservoir would reduce total metal concentrations, the DEIR does not take into account resuspension of settled sediments by winds or inundation zone erosion when the reservoir level is reduced. In addition, dissolution of metals from the bottom sediments under the anoxic conditions expected to occur in the reservoir can substantially increase metals concentrations in the hypolimnion, which will become distributed throughout the water column following fall turnover. “Settling in the reservoir of 95% or more of the sediment that enters the reservoir” would create a significant source for metals in the reservoir from resuspension or dissolution during certain times of the year.

Table 1. Water Quality Data from the Sacramento River below Red Bluff during the Primary Diversion Period of January through March (D=dissolved, T=total)

Sample Date	D-Aluminum ug/L	T-Aluminum ug/L	D-Arsenic ug/L	T-Arsenic ug/L	D-Cadmium ug/L	T-Cadmium ug/L	D-Chromium ug/L	T-Chromium ug/L	D-Copper ug/L	T-Copper ug/L	D-Iron ug/L	T-Iron ug/L
1/10/05	212	322	1.11	1.18	<0.011	<0.007	1.1	1.14	1.93	2.5	143	358
2/2/05	50.1	134	0.893	0.976	<0.011	<0.066	1.35	2.42	1.67	2.04	39.8	185
3/9/05	11	97.3	1.29	1.33	<0.033	<0.011	1.21	1.23	1.39	1.84	8.1	150
1/4/06	1081	2851	1.3	1.65	0.018	0.081	2.48	7.68	6.99	9.42	811	3925
1/24/06	173	347	0.94	1.05	0.018	0.036	1.26	1.32	1.74	2.23	166	394
2/21/06	131	154	0.702	0.789	0.013	0.016	0.97	0.98	1.08	1.21	76	162
3/1/06	1459	2240	0.857	1.06	0.017	0.055	2.75	6.1	2.59	6.09	878	2854
1/10/07	41.7	91.4	1.42	1.5	<0.1	<0.1	0.55	0.59	0.92	1.01	34.9	54.3
2/26/07	212	322	0.929	0.987	<0.1	<0.1	1.2	1.61	2.55	2.8	293	376
3/21/07	9.58	51	1.41	1.46	<0.1	<0.1	0.44	0.59	1.47	1.74	21.5	85.5
1/22/08	6.82	284	1.5	1.71	<0.1	<0.1	0.53	1.15	1.45	2.04	9.5	259
2/26/08	14.2	846	0.799	0.932	<0.1	<0.1	0.33	2.49	1.97	3.88	14.6	790
3/25/08	2.25	35	1.31	1.37	<0.1	<0.1	0.42	0.55	1.7	2.09	7.8	62
2/23/09	55.6	3630	0.519	1.33	<0.1	<0.1	0.4	6.67	2.54	9.81	88.5	3740
1/25/10	127	3375	0.567	1.51	<0.1	<0.1	0.51	10.3	3.55	14.7	132	4160
2/1/10	25.5	426	0.635	0.727	<0.1	<0.1	0.3	1.07	2.14	3.34	24.1	442
3/1/10	34.0	485	0.596	0.768	<0.1	<0.1	0.33	1.6	1.55	3.03	27	574
3/23/10	1.86	13.2	1	1.06	<0.1	<0.1	0.41	0.45	1.48	2.01	8.8	33.4
1/19/11	6.75	175	0.913	1.03	<0.1	<0.1	0.57	1.22	1.54	2.42	18.6	214
1/31/11	6.26	61.4	1.17	1.18	<0.1	<0.1	0.44	0.61	1.57	1.75	9.8	69.2
2/5/13	6.69	152	1.07	1.31	<0.1	<0.1	0.33	0.56	1.23	1.66	11.4	157
2/3/14	8.61	19.3	1.92	1.93	<0.1	<0.1	0.44	0.49	0.79	0.93	31.3	46
2/3/15	4.64	169	1.29	1.62	<0.1	<0.1	0.3	0.72	1.55	3.26	10	207
2/8/16	18.7	78.8	1.23	1.33	<0.1	<0.1	0.51	0.62	1.33	1.81	23.6	104
2/6/17	130	761	0.857	1.11	<0.1	<0.1	0.46	2.11	1.64	4.67	126	729
2/13/18	4.59	23.2	1.55	1.61	<0.1	<0.1	0.58	0.71	0.96	1.22	13.2	51.2
2/18/20			1	1								
Count	26	26	27	27	4	4	26	26	26	26	26	26
Minimum	1.86	13.2	0.52	0.73	ND	ND	0.30	0.45	0.79	0.93	7.8	33.4
Average	151	659	1.07	1.24	0.02	0.05	0.78	2.11	1.90	3.44	117	776
Maximum	1459	3630	1.92	1.93	0.018	0.081	2.75	10.3	6.99	14.7	878	4160

Table 1. Continued

Sample Date	D-Lead ug/L	T-Lead ug/L	D-Manganese ug/L	T-Manganese ug/L	T-Mercury ng/L	D-Nickel ug/L	T-Nickel ug/L	D-Selenium ug/L	T-Selenium ug/L	D-Silver ug/L	T-Silver ug/L	D-Zinc ug/L	T-Zinc ug/L
1/10/05	0.045	0.144	1.38	10.5	ND	1.02	1.6	0.29	0.3	<0.003	0.003	1.67	3.91
2/2/05	0.021	0.075	1.11	7.66	ND	0.9	1.32	ND	ND	<0.001	0.003	1.64	3.15
3/9/05	0.012	0.072	0.64	6.24	ND	0.77	1.2	ND	0.22	<0.001	ND	0.41	2.48
1/4/06	0.575	1.51	10.7	113	ND	2.94	12.2	ND	0.35	<0.001	0.015	7.63	18.8
1/24/06	0.048	0.147	7.25	15.6	ND	1.46	2.11	ND	0.19	<0.005	ND	2.49	3.76
2/21/06	ND	0.049	2.37	5.71	ND	1.53	1.82	ND	0.15	<0.009	ND	1.45	1.99
3/1/06	0.274	1.1	13.5	78.9	ND	2.84	8.57	ND	0.16	<0.009	ND	4.49	13.2
1/10/07	ND	ND	1.37	3.13	0.59	0.97	1.02	ND	ND	<0.03	ND	0.71	2.82
2/26/07	0.149	0.234	6.43	10.2	2.6	1.14	1.49	0.2	0.28	<0.03	ND	3.09	5.68
3/21/07	ND	0.04	1.27	4.8	ND	0.84	0.97	ND	0.2	<0.03	ND	0.38	3.58
1/22/08	ND	0.13	0.73	12.9	ND	0.91	1.08	ND	ND	<0.03	ND	1.33	4.59
2/26/08	ND	0.388	0.58	23.4	ND	1.58	3	ND	0.21	<0.03	ND	0.97	6.85
3/25/08	ND	ND	0.36	6.12	ND	0.71	0.95	ND	0.25	<0.03	ND	0.44	3.11
2/23/09	ND	2.25	1.33	133	ND	1.44	9.9	ND	ND	<0.03	ND	1.28	26
1/25/10	0.069	3.14	1.93	144	ND	13.2	15.7	0.26	0.88	<0.03	0.099	0.76	0.88
2/1/10	ND	0.245	0.74	17.2	ND	1.9	2.01	ND	ND	<0.03	ND	2.09	8.08
3/1/10	ND	0.338	0.88	23.1	ND	0.96	2.44	0.2	0.21	<0.03	ND	0.98	6.09
3/23/10	ND	ND	0.52	3.24	ND	0.6	0.67	0.51	0.61	<0.03	ND	0.19	1.95
1/19/11	ND	0.172	0.86	12.2	ND	1.17	1.38	0.22	0.24	<0.03	ND	1.62	4.38
1/31/11	ND	ND	0.58	5.32	ND	0.81	0.96	ND	ND	<0.03	ND	2.32	4.08
2/5/13	ND	0.055	0.32	4.75	1.2	0.52	0.8	ND	ND	<0.03	ND	1.13	2.84
2/3/14	ND	ND	2.88	4.57	0.7	0.43	0.5	ND	ND	<0.03	ND	0.65	1.09
2/3/15	ND	0.166	0.19	4.75	3.4	0.93	1.3	ND	ND	<0.03	ND	0.88	4.43
1/8/16	ND	0.065	0.32	6.73	1.5	0.82	1.19	0.25	0.28	<0.03	ND	0.94	2.53
2/6/17	ND	0.575	2.78	31.1	ND	1.41	3.89	ND	0.26	<0.03	ND	0.78	7.37
2/13/18	ND	ND	0.34	3.16	ND	1.32	1.7	ND	ND	<0.03	ND	0.29	0.56
2/18/20													
Count	8	20	26	26	6	26	26	7	18	0	4	28	26
Minimum	ND	ND	0.15	3.13	ND	0.43	0.50	ND	ND	ND	ND	0.19	0.56
Average	0.149	0.54	2.35	27	1.7	1.7	3.0	0	0	ND	0	1.56	6
Maximum	0.575	3.14	13.5	144	3.4	13.2	15.7	0.5	0.88	ND	0.099	7.63	26

Table 2. Water Quality Data from the Sacramento River at Hamilton City during the Primary Diversion Period of January through March (D=dissolved, T=total)

Sample Date	D-Aluminum µg/L	T-Aluminum µg/L	D-Arsenic µg/L	T-Arsenic µg/L	D-Cadmium µg/L	T-Cadmium µg/L	D-Chromium µg/L	T-Chromium µg/L	D-Copper µg/L	T-Copper µg/L	D-Iron µg/L	T-Iron µg/L
1/10/05	352	413	1.48	1.55	<0.011	<0.007	1.06	1.44	1.98	2.45	225	443
2/2/05	77.5	163	1.42	1.51	<0.011	<0.066	1.67	1.88	1.53	1.73	71.5	223
3/10/05	11	75.7	2.03	2.08	<0.033	<0.011	1.29	1.39	1.09	1.37	<3.34	118
1/4/06	866	3462	1.61	2.35	0.014	0.092	2.61	9.74	2.47	11.2	569	4787
1/24/06	359	709	1.41	1.49	0.011	0.042	1.51	2.4	1.62	2.92	214	923
2/21/06	222	733	1.3	1.47	0.014	0.029	1.18	2.34	1.12	2.55	139	913
3/1/06	2887	4955	1.36	1.85	0.021	0.087	4.99	11.2	4.26	11.5	1773	6116
1/9/07	61.6	188	2.08	2.23	<0.1	<0.1	0.66	0.69	0.9	1.04	46.3	79.1
2/26/07	478	657	1.31	1.42	<0.1	<0.1	1.81	1.91	2.99	3.9	591	916
3/20/07	16.1	91.6	2.17	2.36	<0.1	<0.1	0.41	0.71	1.22	1.55	26.6	154
2/20/08	5.62	85.8	2.04	2.27	<0.1	<0.1	0.49	0.78	1.09	1.26	7.4	105
2/24/09	51.1	3110	1.62	4.07	<0.1	<0.1	0.47	7.07	2.03	8.21	68.6	3210
2/2/10	12	340	1.37	1.43	<0.1	<0.1	0.36	1.05	1.76	3.65	17.1	383
2/1/11	5.73	53.6	1.9	1.96	<0.1	<0.1	0.43	0.55	1.29	1.41	12	59.6
1/31/12	178	276	2.04	2.2	<0.1	<0.1	0.52	0.6	1	1.33	94.1	162
2/6/13	3.6	127	1.98	2	<0.1	<0.1	0.32	0.75	1.1	1.32	8.2	124
2/4/14	0.19	6.03	2.7	2.88	<0.1	<0.1	0.52	1.31	0.72	0.85	6.2	26.2
2/10/15	21.2	1960	1	2.14	<0.1	<0.1	0.33	5.3	1.96	8	63.2	2100
2/3/16	39.7	352	1.26	1.49	<0.1	<0.1	0.44	1.73	1.15	2.14	42.8	349
2/6/17	136	1020	1.16	1.67	<0.1	<0.1	0.52	3.85	1.79	5.78	138	1100
Count	20	20	20	20	20	20	20	20	20	20	20	20
Minimum	0.19	6.03	1.00	1.42	0.011	0.029	0.32	0.55	0.72	0.85	6.2	26.2
Average	289	936	1.66	2.02	0.02	0.06	1.08	2.83	1.65	3.71	216	1115
Maximum	2887	4955	2.7	4.07	0.021	0.092	4.99	11.2	4.26	11.5	1773	6116

Table 2. Continued

Sample Date	D-Lead µg/L	T-Lead µg/L	D-Manganese µg/L	T-Manganese µg/L	T-Mercury ng/L	D-Nickel µg/L	T-Nickel µg/L	D-Selenium µg/L	T-Selenium µg/L	D-Silver µg/L	T-Silver µg/L	D-Zinc µg/L	T-Zinc µg/L
1/10/05	0.064	0.168	2.22	12.4	N/A	1.39	1.98	0.3	0.34	<0.003	<0.002	1.54	3.1
2/2/05	0.029	0.084	2.54	10.6	N/A	1.02	1.53	<0.222	0.27	0.002	0.003	0.95	1.96
3/10/05	0.008	0.049	0.98	6.37	N/A	0.87	1.24	<0.245	<0.19	<0.001	<0.036	0.36	1.06
1/4/06	0.191	1.89	9.75	134	N/A	2.67	15.4	<0.149	0.22	<0.001	0.021	2.24	20.8
1/24/06	0.062	0.306	9.24	32.4	N/A	1.68	3.32	<0.186	0.19	<0.005	<0.005	1.55	4.71
2/21/06	0.046	0.299	5.83	27.5	N/A	1.53	3.32	<0.149	0.3	<0.009	<0.009	1	3.94
3/1/06	0.648	2.04	23.2	146	N/A	4.69	15.7	<0.149	0.29	<0.009	<0.009	5.79	21.7
1/9/07	<0.04	<0.04	2.22	5.24	0.68	1.01	1.08	<0.2	<0.2	<0.03	<0.03	0.64	2.57
2/26/07	0.262	0.581	10.3	28.8	2.8	2.22	2.99	<0.2	0.23	<0.03	<0.03	3.68	8.39
3/20/07	<0.04	0.056	2.01	8.22	1.6	0.85	1.22	<0.2	<0.2	<0.03	<0.03	0.31	2.82
2/20/08	<0.04	0.041	0.7	8.15	N/A	0.88	0.95	<0.2	0.22	<0.03	<0.03	0.71	3.31
2/24/09	<0.04	1.47	1.28	101	N/A	2.59	11	0.2	0.25	<0.03	<0.03	0.52	14.3
2/2/10	<0.04	0.188	1.01	17.1	N/A	1.78	2.08	<0.2	<0.2	<0.03	<0.03	1.39	5.43
2/1/11	<0.04	<0.04	0.67	6.4	N/A	0.71	0.9	<0.2	<0.2	<0.03	<0.03	0.76	2.68
1/31/12	<0.04	<0.04	1.87	9.58	N/A	0.68	1.11	<0.2	<0.2	<0.03	<0.03	1.17	2.32
2/6/13	<0.04	<0.04	0.35	5.45	1.3	0.44	0.65	<0.2	<0.2	<0.03	<0.03	0.93	1.45
2/4/14	<0.04	<0.04	0.35	2.17	0.8	0.54	0.69	<0.2	0.21	<0.03	<0.03	0.21	0.97
2/10/15	<0.04	1.52	0.96	59.6	29.1	1.36	6.88	0.26	0.31	<0.03	0.037	0.38	13.9
2/3/16	<0.04	0.204	0.62	17.7	3.5	1.26	2.47	0.21	0.28	<0.03	<0.03	0.75	2.98
2/6/17	<0.04	0.945	3.35	43	N/A	1.08	5.36	0.36	0.37	<0.03	<0.03	0.86	9.16
Count	20	20	20	20	20	20	20	20	20	20	20	20	20
Minimum	0.008	0.041	0.35	2.17	0.68	0.44	0.65	0.2	0.19	0.002	0.003	0.21	0.97
Average	0.16	0.66	3.97	34.08	5.68	1.46	3.99	0.27	0.27	0.00	0.02	1.29	6.38
Maximum	0.648	2.04	23.2	146	29.1	4.69	15.7	0.36	0.37	0.002	0.037	5.79	21.7

Table 3. Water Quality Objectives, Numeric Thresholds, and Exceedances for the Sacramento River below Red Bluff

Constituent / Parameter	Water Quality Objective or Promulgated Criterion	Numeric Thresholds Recommended to Implement Objective or Criterion			WQI Data				Evapoconcentrated			
		Source of Numeric Threshold <i>(footnotes in parentheses are at bottom of table)</i>	Numeric Threshold ug/L	G=Groundwater IS=Inland SW E=EB/Estuary O=Ocean	Dissolved		Total		Dissolved		Total	
					Max ug/L	Min	Max	Min	Max	Min	Max	Min
Aluminum					1459	1.86	3630	13.2	2159	2.75	5372.4	19.5
	Chemical Constituents	California Primary MCL	1,000	G & IS	X		X		X		X	
		California Secondary MCL	200	G & IS	X		X		X		X	
		Water Quality for Agriculture (Ayers & Westcot)	5,000	G & IS							X	
	Tastes and Odors	California Secondary MCL	200	G & IS	X		X		X		X	
	Toxicity - humans	California Public Health Goal for Drinking Water	600	G & IS	X		X		X		X	
	Toxicity - fw aquatic life	USEPA National Recomm. WQ Criteria, 4-day avg, total (f)	87	IS	X		X		X		X	
		USEPA National Recomm. WQ Criteria, 1-hour avg, total (f)	750	IS	X		X		X		X	
Arsenic					1.92	0.52	1.93	0.73	2.84	0.77	2.8564	1.08
	Chemical Constituents	California Primary MCL	10	G & IS								
		Water Quality for Agriculture (Ayers & Westcot)	100	G & IS								
	Toxicity - humans	California Public Health Goal for Drinking Water	0.004	G & IS	X	X	X	X	X	X	X	X
		USEPA National Recomm. WQ Criteria, water & fish consump.	0.018	IS	X	X	X	X	X	X	X	X
		USEPA National Recomm. WQ Criteria, fish consumption	0.14	E & O	X	X	X	X	X	X	X	X
		Cal EPA - One in a million incremental cancer risk estimate for drinking water	0.023	G & IS	X	X	X	X	X	X	X	X
		USEPA Health Advisory for drinking water	0.02	G & IS	X	X	X	X	X	X	X	X
		California Proposition 65 Safe Harbor Level - Max. Allowable dose level for reproductive toxicity	0.05	G & IS	X	X	X	X	X	X	X	X
	CTR - fw aquatic life	California Toxics Rule (USEPA), 4-day average (dissolved)	150	IS								
		California Toxics Rule (USEPA), 1-hour average (dissolved)	340	IS								
	CTR - sw aquatic life	California Toxics Rule (USEPA), 4-day average (dissolved)	36	E								
		California Toxics Rule (USEPA), 1-hour average (dissolved)	88	E								
	CA Ocean Plan - aq life	Aquatic Life Protection Objective, 6-month median	8	O								
		Aquatic Life Protection Objective, daily maximum	32	O								
		Aquatic Life Protection Objective, instantaneous maximum	80	O								
Cadmium					0.02	ND	0.081	ND	0.03	ND	0.11988	ND
	Chemical Constituents	California Primary MCL	5	G & IS								
		Water Quality for Agriculture (Ayers & Westcot)	10	G & IS								
	Toxicity - humans	California Public Health Goal for Drinking Water	0.04	G & IS			X				X	
		Cal EPA - One in a million incremental cancer risk estimate for drinking water	0.023	G & IS			X		X		X	
	CTR - fw aquatic life	California Toxics Rule (USEPA), 4-day average, dissolved (f)	1.1	IS								
		California Toxics Rule (USEPA), 1-hour average, dissolved (f)	1.6	IS								
	CTR - sw aquatic life	California Toxics Rule (USEPA), 4-day average, dissolved	8.3	E & O								
		California Toxics Rule (USEPA), 1-hour average, dissolved	42	E & O								
	CA Ocean Plan - aq life	Aquatic Life Protection Objective, 6-month median	1	O								
		Aquatic Life Protection Objective, daily maximum	4	O								
		Aquatic Life Protection Objective, instantaneous maximum	10	O								
Chromium (III)					2.75	0.3	10.3	0.45	4.07	0.44	15.244	0.67
	Chemical Constituents	California Primary MCL (total chromium)	50	G & IS								
	Toxicity - humans	USEPA IRIS Reference Dose (r)	10,000	G & IS								
		Cal EPA - One in a million incremental cancer risk estimate for drinking water	0.07	G & IS	X	X	X	X	X	X	X	X
	NTR - fw aquatic life	National Toxics Rule (USEPA), 4-day average, dissolved (f)	84	IS								
		National Toxics Rule (USEPA), 1-hour average, dissolved (f)	260	IS								
	CA Ocean Plan - humans	Human Health Protection Objective, fish consumption	190,000	O								
	Toxicity - sw aquatic life	USEPA National Recomm. WQ Criteria, acute tox info / 10	1,030	E & O								

Table 3. Continued

Constituent / Parameter	Water Quality Objective or Promulgated Criterion	Numeric Thresholds Recommended to Implement Objective or Criterion			G=Groundwater IS=Inland SW E=EBS/Estuary O=Ocean	WDL Data				Evapoconcentrated			
		Source of Numeric Threshold <i>(footnotes in parentheses are at bottom of table)</i>	Numeric Threshold ug/L	G & IS		Dissolved		Total		Dissolved		Total	
						Max ug/L	Min	Max	Min	Max	Min	Max	Min
Copper						6.99	0.79	14.7	0.93	10.3	1.17	21.756	1.38
	Chemical Constituents	California Primary MCL	1,300	G & IS									
		California Secondary MCL	1,000	G & IS									
		Water Quality for Agriculture (Ayers & Westcot)	200	G & IS									
	Tastes and Odors	California Secondary MCL & USEPA Nat. Res. WQ Criteria	1,000	G & IS									
	Toxicity - humans	California Public Health Goal for Drinking Water	300	G									
	CTR - humans	California Toxics Rule (USEPA) for sources of drinking water	1300	IS									
	CTR - fw aquatic life	California Toxics Rule (USEPA), 4-day average, dissolved (f)	4.1	IS		x		x		x		x	
		California Toxics Rule (USEPA), 1-hour average, dissolved (j)	5.7	IS		x		x		x		x	
	CTR - sw aquatic life	California Toxics Rule (USEPA), 4-day average, dissolved	3.1	E		x		x		x		x	
		California Toxics Rule (USEPA), 1-hour average, dissolved	4.8	E		x		x		x		x	
	CA Ocean Plan - eq life	Aquatic Life Protection Objective, 6-month median	3	O		x		x		x		x	
		Aquatic Life Protection Objective, daily maximum	12	O				x				x	
		Aquatic Life Protection Objective, instantaneous maximum	30	O									
Iron						878	7.8	4160	33.4	1299	11.5	6156.8	49.4
	Chemical Constituents	California Secondary MCL	300	G & IS		x		x		x		x	
		Water Quality for Agriculture (Ayers & Westcot)	5,000	G & IS									
	Tastes and Odors	California Secondary MCL	300	G & IS		x		x		x		x	
	Toxicity - fw aquatic life	USEPA National Recomm. WQ Criteria, 4-day average	1,000	IS				x		x		x	
Lead						0.58	ND	3.14	ND	0.85	ND	4.6472	ND
	Chemical Constituents	California Primary MCL	15	G & IS									
		Water Quality for Agriculture (Ayers & Westcot)	5,000	G & IS									
	Toxicity - humans	California Public Health Goal for Drinking Water	0.2	G & IS		x		x		x		x	
		California Proposition 65 Safe Harbor Level - Max. Allowable dose level for reproductive toxicity	0.26	G & IS		x		x		x		x	
	CTR - fw aquatic life	California Toxics Rule (USEPA), 4-day average, dissolved (f)	0.92	IS				x				x	
		California Toxics Rule (USEPA), 1-hour average, dissolved (j)	24	IS									
	CTR - sw aquatic life	California Toxics Rule (USEPA), 4-day average, dissolved	0.1	E									
		California Toxics Rule (USEPA), 1-hour average, dissolved	210	E									
	CA Ocean Plan - eq life	Aquatic Life Protection Objective, 6-month median	2	O				x				x	
		Aquatic Life Protection Objective, daily maximum	8	O									
		Aquatic Life Protection Objective, instantaneous maximum	20	O									
Manganese						13.5	0.19	144	3.13	20	0.28	213.12	4.63
	Chemical Constituents	California Secondary MCL	90	G & IS				x				x	
		Water Quality for Agriculture (Ayers & Westcot)	200	G & IS									
	Tastes and Odors	California Secondary MCL	50	G & IS				x				x	
	Toxicity - humans	California DPH Notification Level for drinking water	500	G & IS									
		USEPA National Recomm. WQ Criteria, fish consumption	100	IS & E & O				x				x	
Mercury								0.0034	ND			0.00503	ND
	Chemical Constituents	California Primary MCL	2	G & IS									
	Toxicity - humans	California Public Health Goal for Drinking Water	1.2	G									
	CTR - humans	California Toxics Rule (USEPA) for sources of drinking water	0.05	IS									
		California Toxics Rule (USEPA) for other waters	0.051	IS & E									
	Toxicity - fw aquatic life	USEPA National Recomm. WQ Criteria, 4-day avg, dissolved	0.77	IS									
		USEPA National Recomm. WQ Criteria, 1-hour avg, dissolved	1.4	IS									
	Toxicity - sw aquatic life	USEPA National Recomm. WQ Criteria, 4-day avg, dissolved	0.04	E & O									
		USEPA National Recomm. WQ Criteria, 1-hour avg, dissolved	1.8	E & O									
	CA Ocean Plan - eq life	Aquatic Life Protection Objective, 6-month median	0.04	O									
		Aquatic Life Protection Objective, daily maximum	0.16	O									
		Aquatic Life Protection Objective, instantaneous max	0.4	O									

Table 3. Continued

Constituent / Parameter	Water Quality Objective or Promulgated Criterion	Numeric Thresholds Recommended to Implement Objective or Criterion			G=Groundwater IS=Inland SW E=EB/Estuary O=Ocean	WDL Data				Evapoconcentrated			
		Source of Numeric Threshold <i>(footnotes in parentheses are at bottom of table)</i>	Numeric Threshold ug/L	Dissolved		Total		Dissolved		Total			
				Max ug/L		Min	Max ug/L	Min	Max ug/L	Min	Max ug/L	Min	
Nickel					13.2	0.43	15.7	0.5	19.5	0.64	23.2	0.74	
	Chemical Constituents	California Primary MCL	100	G & IS									
		Water Quality for Agriculture (Ayers & Westcot)	200	G & IS									
	Toxicity - humans	California Public Health Goal for Drinking Water	12	G	x		x		x		x		
		USEPA National Recomm. WQ Criteria, fish consumption	4,600	IS & E & O									
	CTR - humans	California Toxics Rule (USEPA) for sources of drinking water	610	IS									
		California Toxics Rule (USEPA) for other waters	4,600	IS & E									
	CTR - fw aquatic life	California Toxics Rule (USEPA), 4-day average, dissolved (f)	24	IS									
		California Toxics Rule (USEPA), 1-hour average, dissolved (i)	220	IS									
	CTR - sw aquatic life	California Toxics Rule (USEPA), 4-day average, dissolved	6	E	x		x		x		x		
		California Toxics Rule (USEPA), 1-hour average, dissolved	74	E									
	CA Ocean Plan - aq life	Aquatic Life Protection Objective, 6-month median	5	O	x		x		x		x		
		Aquatic Life Protection Objective, daily maximum	20	O							x		
		Aquatic Life Protection Objective, instantaneous maximum	50	O									
Selenium					0.51	ND	0.88	ND	0.75	ND	1.30		
	Chemical Constituents	California Primary MCL	50	G & IS									
		Water Quality for Agriculture (Ayers & Westcot)	20	G & IS									
	Toxicity - humans	California Public Health Goal for Drinking Water	38	G & IS									
		USEPA National Recomm. WQ Criteria, water & fish consump.	170	IS									
		USEPA National Recomm. WQ Criteria, fish consumption	4,200	E & O									
	NTR - fw aquatic life	National Toxics Rule (USEPA), 4-day average, total	5	IS									
		National Toxics Rule (USEPA), 1-hour average, total	20	IS									
	CTR - sw aquatic life	California Toxics Rule (USEPA), 4-day average, dissolved	71	E									
		California Toxics Rule (USEPA), 1-hour average, dissolved	280	E									
	CA Ocean Plan - aq life	Aquatic Life Protection Objective, 6-month median	15	O									
		Aquatic Life Protection Objective, daily maximum	60	O									
		Aquatic Life Protection Objective, instantaneous maximum	150	O									
Zinc					7.63	0.19	26	0.56	11.3	0.28	38.5	0.83	
	Chemical Constituents	California Secondary MCL	5,000	G & IS									
		Water Quality for Agriculture (Ayers & Westcot)	2,000	G & IS									
	Tastes and Odors	California Secondary MCL	5,000	G & IS									
	Toxicity - humans	USEPA IRIS Reference Dose (c)	2,100	G & IS									
		USEPA National Recomm. WQ Criteria, water & fish consump.	7,400	IS									
		USEPA National Recomm. WQ Criteria, fish consumption	26,000	E & O									
	CTR - fw aquatic life	California Toxics Rule (USEPA), 1-hour average, dissolved (f)	54	IS									
		California Toxics Rule (USEPA), 4-day average, dissolved (f)	54	IS									
	Toxicity - sw aquatic life	USEPA National Recomm. WQ Criteria, 4-day avg, dissolved	81	E & O									
		USEPA National Recomm. WQ Criteria, 1-hour avg, dissolved	90	E & O									
	CA Ocean Plan - aq life	Aquatic Life Protection Objective for Lead, 6-month median	20	O			x				x		
		Aquatic Life Protection Objective for Lead, daily maximum	80	O									
		Aquatic Life Protection Objective for Lead, instantaneous max	200	O									

Table 4. Water Quality Objectives, Numeric Thresholds, and Exceedances for the Sacramento River at Hamilton City

Constituent / Parameter	Water Quality Objective or Promulgated Criterion	Numeric Thresholds Recommended to Implement Objective or Criterion			WDL Data				Evapoconcentrated			
		Source of Numeric Threshold (footnotes in parentheses are at bottom of table)	Numeric Threshold ug/L		Dissolved		Total		Dissolved		Total	
					Max	Min	Max	Min	Max	Min	Max	Min
					ug/L		ug/L		ug/L		ug/L	
Aluminum					2887	0.19	4955	6.03	4273	0.28	7333	8.92
Chemical Constituents	California Primary MCL	1,000	G & IS	x		x		x		x		
	California Secondary MCL	200	G & IS	x		x		x		x		
	Water Quality for Agriculture (Ayers & Westcott)	5,000	G & IS								x	
Tastes and Odors	California Secondary MCL	200	G & IS	x		x		x		x		
Toxicity - humans	California Public Health Goal for Drinking Water	600	G & IS	x		x		x		x		
Toxicity - fw aquatic life	USEPA National Recomm. WQ Criteria, 4-day avg, total (f)	87	IS	x		x		x		x		
	USEPA National Recomm. WQ Criteria, 1-hour avg, total (f)	750	IS	x		x		x		x		
Arsenic					2.7	1.00	4.07	1.42	4.0	1.48	6.02	2.10
Chemical Constituents	California Primary MCL	10	G & IS									
	Water Quality for Agriculture (Ayers & Westcott)	100	G & IS									
Toxicity - humans	California Public Health Goal for Drinking Water	0.004	G & IS	x	x	x	x	x	x	x	x	x
	USEPA National Recomm. WQ Criteria, water & fish consump.	0.016	IS	x	x	x	x	x	x	x	x	x
	USEPA National Recomm. WQ Criteria, fish consumption	0.14	E & O	x	x	x	x	x	x	x	x	x
	Cal EPA - One in a million incremental cancer risk estimate for drinking water	0.023	G & IS	x	x	x	x	x	x	x	x	x
	California Proposition 65 Safe Harbor Level - Max. Allowable dose level for reproductive toxicity	0.06	G & IS	x	x	x	x	x	x	x	x	x
	USEPA IRIS Reference Dose Drinking Water Health Advisories	2.1	G & IS	x		x		x		x		x
CTR - fw aquatic life	California Toxics Rule (USEPA), 4-day average (dissolved)	150	IS									
	California Toxics Rule (USEPA), 1-hour average (dissolved)	340	IS									
CTR - sw aquatic life	California Toxics Rule (USEPA), 4-day average (dissolved)	36	E									
	California Toxics Rule (USEPA), 1-hour average (dissolved)	60	E									
CA Ocean Plan - aq life	Aquatic Life Protection Objective, 6-month median	8	O									
	Aquatic Life Protection Objective, daily maximum	32	O									
	Aquatic Life Protection Objective, instantaneous maximum	80	O									
Cadmium					0.021	ND	0.092	ND	0.031	ND	0.136	ND
Chemical Constituents	California Primary MCL	5	G & IS									
	Water Quality for Agriculture (Ayers & Westcott)	10	G & IS									
Toxicity - humans	California Public Health Goal for Drinking Water	0.04	G & IS			x					x	
	Cal EPA - One in a million incremental cancer risk estimate for drinking water	0.0023	G & IS	x		x		x		x		x
CTR - fw aquatic life	California Toxics Rule (USEPA), 4-day average, dissolved (f)	1.1	IS									
	California Toxics Rule (USEPA), 1-hour average, dissolved (f)	1.6	IS									
CTR - sw aquatic life	California Toxics Rule (USEPA), 4-day average, dissolved	9.3	E & O									
	California Toxics Rule (USEPA), 1-hour average, dissolved	42	E & O									
CA Ocean Plan - aq life	Aquatic Life Protection Objective, 6-month median	1	O									
	Aquatic Life Protection Objective, daily maximum	4	O									
	Aquatic Life Protection Objective, instantaneous maximum	10	O									

Table 4. Continued

Constituent / Parameter	Water Quality Objective or Promulgated Criterion	Numeric Thresholds Recommended to Implement Objective or Criterion			WDL Data				Evapocentrated			
		Source of Numeric Threshold (footnotes in parentheses are at bottom of table)	Numeric Threshold ug/L	Dissolved		Total		Dissolved		Total		
				Max ug/L	Min	Max ug/L	Min	Max ug/L	Min	Max ug/L	Min	
Chromium (III)				4.99	0.32	11.2	0.55	7.39	0.47	16.6	0.814	
Chemical Constituents	California Primary MCL (total chromium)		50 G & IS									
Toxicity - humans	USEPA IRIS Reference Dose (c)		10,500 G & IS									
	Cal EPA/OEHHA - California Public Health Goal		0.02 G & IS	x	x	x	x	x	x	x	x	
	Cal EPA - One in a million incremental cancer risk estimate for drinking water		0.07 G & IS	x	x	x	x	x	x	x	x	
NTR - fw aquatic life	National Toxics Rule (USEPA), 4-day average, dissolved (i)		84 IS									
	National Toxics Rule (USEPA), 1-hour average, dissolved (j)		269 IS									
CA Ocean Plan - humans	Human Health Protection Objective, fish consumption		198,000 O									
Toxicity - sw aquatic life	USEPA National Recomm. WQ Criteria, acute tox info / 10		1,030 E & O									
Copper				4.26	0.72	11.5	0.85	6.30	1.07	17.0	1.258	
Chemical Constituents	California Primary MCL		1,300 G & IS									
	California Secondary MCL		1,000 G & IS									
	Water Quality for Agriculture (Ayens & Westcot)		209 G & IS									
Tastes and Odors	California Secondary MCL & USEPA Nat. Rec. WQ Criteria		1,000 G & IS									
Toxicity - humans	California Public Health Goal for Drinking Water		309 G									
CTR - humans	California Toxics Rule (USEPA) for sources of drinking water		1300 IS									
CTR - fw aquatic life	California Toxics Rule (USEPA), 4-day average, dissolved (i)		4.1 IS	x		x		x		x		
	California Toxics Rule (USEPA), 1-hour average, dissolved (j)		5.7 IS			x		x		x		
CTR - sw aquatic life	California Toxics Rule (USEPA), 4-day average, dissolved		3.1 E	x		x		x		x		
	California Toxics Rule (USEPA), 1-hour average, dissolved		4.8 E			x		x		x		
CA Ocean Plan - aq life	Aquatic Life Protection Objective, 6-month median		3 O	x		x		x		x		
	Aquatic Life Protection Objective, daily maximum		12 O							x		
	Aquatic Life Protection Objective, instantaneous maximum		30 O									
Iron				1773	6.2	6116	26.2	2624	9.18	9052	38.8	
Chemical Constituents	California Secondary MCL		309 G & IS	x		x		x		x		
	Water Quality for Agriculture (Ayens & Westcot)		5,000 G & IS			x				x		
Tastes and Odors	California Secondary MCL		309 G & IS	x		x		x		x		
Toxicity - fw aquatic life	USEPA National Recomm. WQ Criteria, 4-day average		1,000 IS	x		x		x		x		
Lead				0.648	0.008	2.04	0.041	0.959	ND	3.02	ND	
Chemical Constituents	California Primary MCL		15 G & IS									
	Water Quality for Agriculture (Ayens & Westcot)		5,000 G & IS									
Toxicity - humans	California Public Health Goal for Drinking Water		0.2 G & IS	x		x		x		x		
	Cal EPA - One in a million incremental cancer risk estimate for drinking water		0.2 G & IS	x		x		x		x		
	California Proposition 65 Safe Harbor Level - Max. Allowable dose level for reproductive toxicity		0.25 G & IS	x		x		x		x		
CTR - fw aquatic life	California Toxics Rule (USEPA), 4-day average, dissolved (i)		0.92 IS			x		x		x		
	California Toxics Rule (USEPA), 1-hour average, dissolved (j)		24 IS									
CTR - sw aquatic life	California Toxics Rule (USEPA), 4-day average, dissolved		8.1 E									
	California Toxics Rule (USEPA), 1-hour average, dissolved		219 E									
CA Ocean Plan - aq life	Aquatic Life Protection Objective, 6-month median		2 O			x				x		
	Aquatic Life Protection Objective, daily maximum		8 O									
	Aquatic Life Protection Objective, instantaneous maximum		20 O									

Table 4. Continued

Constituent / Parameter	Water Quality Objective or Promulgated Criterion	Numeric Thresholds Recommended to Implement Objective or Criterion				WDL Data				Evapoconcentrated			
		Source of Numeric Threshold (footnotes in parentheses are at bottom of table)	Numeric Threshold ug/L		Dissolved		Total		Dissolved		Total		
					Max ug/L	Min	Max	Min	Max	Min	Max	Min	
Manganese					23.2	0.35	146	2.17	34.3	0.52	216	3.21	
	Chemical Constituents	California Secondary MCL	90	G & IS			x				x		
		Water Quality for Agriculture (Ayers & Westcot)	200	G & IS							x		
	Tastes and Odors	California Secondary MCL	90	G & IS			x				x		
	Toxicity - humans	California DPH Notification Level for drinking water	500	G & IS							x		
		USEPA National Recomm. WQ Criteria, fish consumption	100	E & O			x				x		
Mercury							0.025	#####			0.0431	0.00101	
	Chemical Constituents	California Primary MCL	2	G & IS									
	Toxicity - humans	California Public Health Goal for Drinking Water	1.2	G									
	CTR - humans	California Toxics Rule (USEPA) for sources of drinking water	0.05	IS									
		California Toxics Rule (USEPA) for other waters	0.051	IS & E									
	Toxicity - fw aquatic life	USEPA National Recomm. WQ Criteria, 4-day avg, dissolved	0.77	IS									
		USEPA National Recomm. WQ Criteria, 1-hour avg, dissolved	1.4	IS									
	Toxicity - sw aquatic life	USEPA National Recomm. WQ Criteria, 4-day avg, dissolved	0.94	E & O									
		USEPA National Recomm. WQ Criteria, 1-hour avg, dissolved	1.8	E & O									
	CA Ocean Plan - aq life	Aquatic Life Protection Objective, 6-month median	0.04	O									
		Aquatic Life Protection Objective, daily maximum	0.16	O									
		Aquatic Life Protection Objective, instantaneous max	0.4	O									
Nickel					4.69	0.44	15.7	0.65	6.94	0.65	23.2	0.96	
	Chemical Constituents	California Primary MCL	100	G & IS									
		Water Quality for Agriculture (Ayers & Westcot)	200	G & IS									
	Toxicity - humans	California Public Health Goal for Drinking Water	12	G			x				x		
		USEPA National Recomm. WQ Criteria, fish consumption	4,600	E & O									
	CTR - humans	California Toxics Rule (USEPA) for sources of drinking water	616	IS									
		California Toxics Rule (USEPA) for other waters	4,600	IS & E									
	CTR - fw aquatic life	California Toxics Rule (USEPA), 4-day average, dissolved (f)	24	IS									
		California Toxics Rule (USEPA), 1-hour average, dissolved (f)	220	IS									
	CTR - sw aquatic life	California Toxics Rule (USEPA), 4-day average, dissolved	8	E			x				x		
		California Toxics Rule (USEPA), 1-hour average, dissolved	74	E									
	CA Ocean Plan - aq life	Aquatic Life Protection Objective, 6-month median	5	O			x		x		x		
		Aquatic Life Protection Objective, daily maximum	20	O							x		
		Aquatic Life Protection Objective, instantaneous maximum	80	O									
Selenium					0.36	0.20	0.37	0.19	0.53	ND	0.55	ND	
	Chemical Constituents	California Primary MCL	80	G & IS									
		Water Quality for Agriculture (Ayers & Westcot)	20	G & IS									
	Toxicity - humans	California Public Health Goal for Drinking Water	30	G & IS									
		USEPA National Recomm. WQ Criteria, water & fish consump.	170	IS									
		USEPA National Recomm. WQ Criteria, fish consumption	4,200	E & O									
	NTR - fw aquatic life	National Toxics Rule (USEPA), 4-day average, total	5	IS									
		National Toxics Rule (USEPA), 1-hour average, total	20	IS									
	CTR - sw aquatic life	California Toxics Rule (USEPA), 4-day average, dissolved	71	E									
		California Toxics Rule (USEPA), 1-hour average, dissolved	290	E									
	CA Ocean Plan - aq life	Aquatic Life Protection Objective, 6-month median	15	O									
		Aquatic Life Protection Objective, daily maximum	60	O									
		Aquatic Life Protection Objective, instantaneous maximum	150	O									

Table 4. Continued

Constituent / Parameter	Water Quality Objective or Promulgated Criterion	Numeric Thresholds Recommended to Implement Objective or Criterion			WDL Data				Evaporconcentrated			
		Source of Numeric Threshold <i>(footnotes in parentheses are at bottom of table)</i>	Numeric Threshold ug/L		Dissolved		Total		Dissolved		Total	
					Max	Min	Max	Min	Max	Min	Max	Min
					ug/L		ug/L		ug/L		ug/L	
Zinc					5.79	0.21	21.7	0.97	8.5692	0.31	32.1	1.44
	Chemical Constituents	California Secondary MCL	5,000	G & IS								
		Water Quality for Agriculture (Ayers & Westcott)	2,000	G & IS								
	Tastes and Odors	California Secondary MCL	5,000	G & IS								
	Toxicity - humans	USEPA IRIS Reference Dose (c)	2,100	G & IS								
		USEPA National Recomm. WQ Criteria, water & fish consump.	7,400	IS								
		USEPA National Recomm. WQ Criteria, fish consumption	26,000	E & O								
	CTR - fw aquatic life	California Toxics Rule (USEPA), 1-hour average, dissolved (f)	54	IS								
		California Toxics Rule (USEPA), 4-day average, dissolved (f)	54	IS								
	Toxicity - sw aquatic life	USEPA National Recomm. WQ Criteria, 4-day avg, dissolved	81	E & O								
		USEPA National Recomm. WQ Criteria, 1-hour avg, dissolved	90	E & O								
	CA Ocean Plan - aq life	Aquatic Life Protection Objective for Lead, 6-month median	20	O			x				x	
		Aquatic Life Protection Objective for Lead, daily maximum	80	O								
		Aquatic Life Protection Objective for Lead, instantaneous max	200	O								

Table 5 Projected Metals Concentrations

	Sample Date	D-Aluminum ug/L	T-Aluminum ug/L	D-Arsenic ug/L	T-Arsenic ug/L	D-Cadmium ug/L	T-Cadmium ug/L	D-Chromium ug/L	T-Chromium ug/L
Cottonwood Creek	3/1/06	2533	3739	0.889	1.16	0.009	0.023	8.2	15.7
Sacramento R below Red Bluff	3/1/06	1459	2240	0.857	1.06	0.017	0.055	2.75	6.1
Multiplication Factor (SacR/CottonwoodCr)		0.6	0.6	1.0	0.9	1.9	2.4	0.3	0.4
Maximum Cottonwood Creek Concentration		2533	14345	0.889	3.04	0.009	0.085	8.2	36.5
Projected Maximum Sacramento River Concentration		1459	8594	0.857	2.78	0.017	0.203	2.75	14.2
Sites Reservoir Concentration after Evapoconcentration (48 percent)		2159	12719	1.27	4.11	0.025	0.30	4.07	21.0
Sacramento River at Hamilton City (May through September, WDI)		1075	6686	2.36	3.17	0.007	0.076	2.69	18.9
Effects of Sites Reservoir Releases on Water Quality in the Sacramento River at Hamilton City		1216	7470	2.22	3.29	0.009	0.105	2.87	19.17

	Sample Date	D-Copper ug/L	T-Copper ug/L	D-Iron ug/L	T-Iron ug/L	D-Lead ug/L	T-Lead ug/L	D-Manganese ug/L	T-Manganese ug/L
Cottonwood Creek	3/1/06	3.22	7.63	1760	5793	0.491	1.53	30.8	138
Sacramento R below Red Bluff	3/1/06	2.59	6.09	878	2854	0.274	1.1	13.5	78.9
Multiplication Factor (SacR/CottonwoodCr)		0.8	0.8	0.5	0.5	0.6	0.7	0.4	0.6
Maximum Cottonwood Creek Concentration		4.43	39.2	1760	23594	0.491	7.26	30.8	563
Projected Maximum Sacramento River Concentration		3.56	31.29	878	11624	0.274	5.2	13.5	322
Sites Reservoir Concentration after Evapoconcentration (48 percent)		5.27	46.3	1299	17209	0.41	7.7	20.0	476
Sacramento River at Hamilton City (May through September, WDI)		3.11	18.7	726	10052	0.202	3.24	7.33	272
Effects of Sites Reservoir Releases on Water Quality in the Sacramento River at Hamilton City		3.39	22.29	801	10982	0.228	3.82	8.97	299

	Sample Date	D-Nickel ug/L	T-Nickel ug/L	D-Selenium ug/L	T-Selenium ug/L	D-Silver ug/L	T-Silver ug/L	D-Zinc ug/L	T-Zinc ug/L
Cottonwood Creek	3/1/06	7.35	20.9	0	0.15	ND	ND	3.64	13.6
Sacramento R below Red Bluff	3/1/06	2.84	8.57	0	0.16	ND	ND	4.49	13.2
Multiplication Factor (SacR/CottonwoodCr)		0.4	0.4	1.0	1.1	-	-	1.2	1.0
Maximum Cottonwood Creek Concentration		7.35	57.9	0.74	0.81	0.039	0.181	3.64	72
Projected Maximum Sacramento River Concentration		2.84	23.7	0.74	0.86	-	-	4.49	70
Sites Reservoir Concentration after Evapoconcentration (48 percent)		4.20	35.1	1.10	1.28	-	-	6.55	103
Sacramento River at Hamilton City (May through September, WDI)		2.75	10.7	0.34	0.35	0.018	2.11	2.46	35

Table 6. Projected metals concentrations in the Sacramento River at Hamilton City and CBD with dilution of Sites Reservoir water in the respective water bodies

Constituent / Parameter	Water Quality Objective or Promulgated Criterion	Numeric Thresholds Recommended to Implement Objective or Criterion				Sacramento River at Hamilton City		Cofusa Basin Drain	
		Source of Numeric Threshold (footnotes in parentheses are at bottom of table)	Numeric Threshold	Units	G=Groundwater IS=Inland SW E=EB/Estuary O=Ocean	Dissolved	Total	Dissolved	Total
Aluminum						1216	7470	338	2542
	Chemical Constituents	California Primary MCL	1,000	ug/L	G & IS	x	x		x
		California Secondary MCL	200	ug/L	G & IS	x	x		x
		Water Quality for Agriculture (Ayens & Westcot)	5,000	ug/L	G & IS		x		
	Tastes and Odors	California Secondary MCL	200	ug/L	G & IS	x	x		x
	Toxicity - humans	California Public Health Goal for Drinking Water	600	ug/L	G & IS	x	x		x
	Toxicity - fw aquatic life	USEPA National Recomm. WQ Criteria, 4-day avg. total (f)	87	ug/L	IS	x	x		x
		USEPA National Recomm. WQ Criteria, 1-hour avg. total (f)	750	ug/L	IS	x	x		x
Arsenic						2.22	3.29	3.85	4.67
	Chemical Constituents	California Primary MCL	10	ug/L	G & IS				
		Water Quality for Agriculture (Ayens & Westcot)	100	ug/L	G & IS				
	Toxicity - humans	California Public Health Goal for Drinking Water	0.004	ug/L	G & IS	x	x	x	x
		USEPA National Recomm. WQ Criteria, water & fish consump.	0.018	ug/L	IS	x	x	x	x
		USEPA National Recomm. WQ Criteria, fish consumption	0.14	ug/L	E & O	x	x	x	x
	CTR - fw aquatic life	California Toxics Rule (USEPA), 4-day average (dissolved)	150	ug/L	IS				
		California Toxics Rule (USEPA), 1-hour average (dissolved)	340	ug/L	IS				
	CTR - sw aquatic life	California Toxics Rule (USEPA), 4-day average (dissolved)	38	ug/L	E				
		California Toxics Rule (USEPA), 1-hour average (dissolved)	68	ug/L	E				
	CA Ocean Plan - sq life	Aquatic Life Protection Objective, 6-month median	8	ug/L	G				
		Aquatic Life Protection Objective, daily maximum	32	ug/L	O				
		Aquatic Life Protection Objective, instantaneous maximum	80	ug/L	O				
Cadmium						0.009	0.105	0.054	0.089
	Chemical Constituents	California Primary MCL	5	ug/L	G & IS				
		Water Quality for Agriculture (Ayens & Westcot)	10	ug/L	G & IS				
	Toxicity - humans	California Public Health Goal for Drinking Water	0.04	ug/L	G & IS		x		
	CTR - fw aquatic life	California Toxics Rule (USEPA), 4-day average, dissolved (f)	1.1	ug/L	IS				
		California Toxics Rule (USEPA), 1-hour average, dissolved (f)	1.6	ug/L	IS				
	CTR - sw aquatic life	California Toxics Rule (USEPA), 4-day average, dissolved	9.9	ug/L	E & O				
		California Toxics Rule (USEPA), 1-hour average, dissolved	43	ug/L	E & O				
	CA Ocean Plan - sq life	Aquatic Life Protection Objective, 6-month median	1	ug/L	G				
		Aquatic Life Protection Objective, daily maximum	4	ug/L	O				
		Aquatic Life Protection Objective, instantaneous maximum	10	ug/L	O				
Chromium (III)						2.87	19.17	1.14	5.95
	Chemical Constituents	California Primary MCL (total chromium)	50	ug/L	G & IS				
	Toxicity - humans	USEPA IRIS Reference Dose (c)	10,500	ug/L	G & IS				
	WTR - fw aquatic life	National Toxics Rule (USEPA), 4-day average, dissolved (f)	84	ug/L	IS				
		National Toxics Rule (USEPA), 1-hour average, dissolved (f)	260	ug/L	IS				
	CA Ocean Plan - humans	Human Health Protection Objective, fish consumption	190,000	ug/L	O				
	Toxicity - sw aquatic life	USEPA National Recomm. WQ Criteria, acute tox info / 10	1,030	ug/L	E & O				
Copper						3.39	22.29	3.24	11
	Chemical Constituents	California Primary MCL	1,300	ug/L	G & IS				
		California Secondary MCL	1,000	ug/L	G & IS				
		Water Quality for Agriculture (Ayens & Westcot)	200	ug/L	G & IS				
	Tastes and Odors	California Secondary MCL & USEPA Nat. Rec. WQ Criteria	1,000	ug/L	G & IS				
	Toxicity - humans	California Public Health Goal for Drinking Water	300	ug/L	G				
	CTR - humans	California Toxics Rule (USEPA) for sources of drinking water	1300	ug/L	IS				
	CTR - fw aquatic life	California Toxics Rule (USEPA), 4-day average, dissolved (f)	4.1	ug/L	IS		x		x
		California Toxics Rule (USEPA), 1-hour average, dissolved (f)	6.7	ug/L	IS		x		x
	CTR - sw aquatic life	California Toxics Rule (USEPA), 4-day average, dissolved	3.1	ug/L	E	x	x		x
		California Toxics Rule (USEPA), 1-hour average, dissolved	4.8	ug/L	E		x		x
	CA Ocean Plan - sq life	Aquatic Life Protection Objective, 6-month median	3	ug/L	G	x	x	x	x
		Aquatic Life Protection Objective, daily maximum	12	ug/L	O		x		
		Aquatic Life Protection Objective, instantaneous maximum	30	ug/L	O				
Iron						801	10982	260	3580
	Chemical Constituents	California Secondary MCL	300	ug/L	G & IS	x	x		x
		Water Quality for Agriculture (Ayens & Westcot)	5,000	ug/L	G & IS		x		
	Tastes and Odors	California Secondary MCL	300	ug/L	G & IS	x	x		x
	Toxicity - fw aquatic life	USEPA National Recomm. WQ Criteria, 4-day average	1,000	ug/L	IS		x		x

Table 6. Continued

Constituent / Parameter	Water Quality Objective or Promulgated Criterion	Numeric Thresholds Recommended to Implement Objective or Criterion			G=Groundwater IS=Inland SW E=Estuary O=Ocean	Sacramento River at Hamilton City		Colusa Basin Drain	
		Source of Numeric Threshold (footnotes in parentheses are at bottom of table)	Numeric Threshold ug/L	Units		Dissolved	Total	Dissolved	Total
<b>Lead</b>						<b>0.228</b>	<b>3.82</b>	<b>0.106</b>	<b>1.68</b>
	Chemical Constituents	California Primary MCL	15	ug/L	G & IS				
		Water Quality for Agriculture (Ayers & Westcott)	5,000	ug/L	G & IS				
	Toxicity - humans	California Public Health Goal for Drinking Water	0.2	ug/L	G & IS	x	x		x
	CTR - fw aquatic life	California Toxics Rule (USEPA), 4-day average, dissolved (?)	0.92	ug/L	IS	x	x		x
		California Toxics Rule (USEPA), 1-hour average, dissolved (I)	26	ug/L	IS				
	CTR - sw aquatic life	California Toxics Rule (USEPA), 4-day average, dissolved	8.1	ug/L	E				
		California Toxics Rule (USEPA), 1-hour average, dissolved	210	ug/L	E				
	CA Ocean Plan - aq life	Aquatic Life Protection Objective, 6-month median	2	ug/L	G		x		
		Aquatic Life Protection Objective, daily maximum	8	ug/L	O				
		Aquatic Life Protection Objective, instantaneous maximum	20	ug/L	O				
<b>Manganese</b>						<b>8.97</b>	<b>299</b>	<b>14.9</b>	<b>208</b>
	Chemical Constituents	California Secondary MCL	50	ug/L	G & IS		x		x
		Water Quality for Agriculture (Ayers & Westcott)	250	ug/L	G & IS		x		x
	Tastes and Odors	California Secondary MCL	50	ug/L	G & IS		x		x
	Toxicity - humans	California DPH Notification Level for drinking water	500	ug/L	G & IS				
		USEPA National Recomen. WQ Criteria, fish consumption	100	ug/L	IS & E & O		x		x
<b>Nickel</b>						<b>2.94</b>	<b>13.88</b>	<b>3.33</b>	<b>11.2</b>
	Chemical Constituents	California Primary MCL	100	ug/L	G & IS				
		Water Quality for Agriculture (Ayers & Westcott)	250	ug/L	G & IS				
	Toxicity - humans	California Public Health Goal for Drinking Water	12	ug/L	G		x		
		USEPA National Recomen. WQ Criteria, fish consumption	4,600	ug/L	IS & E & O				
	CTR - humans	California Toxics Rule (USEPA) for sources of drinking water	650	ug/L	IS				
		California Toxics Rule (USEPA) for other waters	4,600	ug/L	IS & E				
	CTR - fw aquatic life	California Toxics Rule (USEPA), 4-day average, dissolved (E)	58	ug/L	IS				
		California Toxics Rule (USEPA), 1-hour average, dissolved (I)	220	ug/L	IS				
	CTR - sw aquatic life	California Toxics Rule (USEPA), 4-day average, dissolved	8	ug/L	E		x		x
		California Toxics Rule (USEPA), 1-hour average, dissolved	74	ug/L	E				
	CA Ocean Plan - aq life	Aquatic Life Protection Objective, 6-month median	5	ug/L	O		x		x
		Aquatic Life Protection Objective, daily maximum	20	ug/L	O				
		Aquatic Life Protection Objective, instantaneous maximum	50	ug/L	O				
<b>Selenium</b>						<b>0.438</b>	<b>0.47</b>	<b>0.516</b>	<b>0.627</b>
	Chemical Constituents	California Primary MCL	50	ug/L	G & IS				
		Water Quality for Agriculture (Ayers & Westcott)	20	ug/L	G & IS				
	Toxicity - humans	California Public Health Goal for Drinking Water	30	ug/L	G & IS				
		USEPA National Recomen. WQ Criteria, water & fish consump.	170	ug/L	IS				
		USEPA National Recomen. WQ Criteria, fish consumption	4,200	ug/L	E & O				
	NTR - fw aquatic life	National Toxics Rule (USEPA), 4-day average, total	5	ug/L	IS				
		National Toxics Rule (USEPA), 1-hour average, total	20	ug/L	IS				
	CTR - sw aquatic life	California Toxics Rule (USEPA), 4-day average, dissolved	71	ug/L	E				
		California Toxics Rule (USEPA), 1-hour average, dissolved	290	ug/L	E				
	CA Ocean Plan - aq life	Aquatic Life Protection Objective, 6-month median	15	ug/L	O				
		Aquatic Life Protection Objective, daily maximum	60	ug/L	O				
		Aquatic Life Protection Objective, instantaneous maximum	150	ug/L	O				
<b>Zinc</b>						<b>3</b>	<b>43.9</b>	<b>1.56</b>	<b>19.1</b>
	Chemical Constituents	California Secondary MCL	5,000	ug/L	G & IS				
		Water Quality for Agriculture (Ayers & Westcott)	2,000	ug/L	G & IS				
	Tastes and Odors	California Secondary MCL	5,000	ug/L	G & IS				
	Toxicity - humans	USEPA IRIS Reference Dose (RfD)	2,100	ug/L	G & IS				
		USEPA National Recomen. WQ Criteria, water & fish consump.	7,400	ug/L	IS				
		USEPA National Recomen. WQ Criteria, fish consumption	26,000	ug/L	E & O				
	CTR - fw aquatic life	California Toxics Rule (USEPA), 1-hour average, dissolved (I)	54	ug/L	IS				
		California Toxics Rule (USEPA), 4-day average, dissolved (?)	54	ug/L	IS				
	Toxicity - sw aquatic life	USEPA National Recomen. WQ Criteria, 4-day avg. dissolved	61	ug/L	E & O				
		USEPA National Recomen. WQ Criteria, 1-hour avg. dissolved	90	ug/L	E & O				
	CA Ocean Plan - aq life	Aquatic Life Protection Objective for Lead, 6-month median	20	ug/L	O		x		
		Aquatic Life Protection Objective for Lead, daily maximum	80	ug/L	O				
		Aquatic Life Protection Objective for Lead, instantaneous max	200	ug/L	O				

A “Reservoir Management Plan” is identified on page 6-47. The RMP Page 2D-37) states that “past studies of metal concentrations in the Sacramento River have not focused on high flows that will be the source water for Sites Reservoir. Metal concentrations at the diversion(s) will be measured within 24 hours of the start of diversions at RBPP and every 2 weeks during continuous diversions.” “After 2 years of measuring metal concentrations in the diversions, the frequency of measurements will decrease to monthly.” Rather than focusing on a strict protocol or set schedule of monitoring at 2-week intervals, monitoring should target a range of flow conditions to better understand the relationship between flow and metals concentrations. Event based monitoring may require data collection biweekly, weekly, or even on a daily basis as flow conditions vary. Additional consideration for monitoring would include analyzing differences in water quality based on whether flows are primarily composed of water from Shasta Lake or tributary inflows dominate the flow in the Sacramento River at the diversion points, and dry, normal, and wet year effects on water quality. Two years of data collection likely will not be sufficient to provide the required information.

The description of the SWRCB’s Antidegradation Policy on page 6-47 is misleading in stating that the policy allows for some degradation in consideration for increased beneficial uses, the supposed beneficial use being increased water supply from the proposed reservoir. The Antidegradation Policy prohibits discharges that would degrade water quality even though the degradation would not exceed water quality objectives because no capacity would exist for degradation that will be caused by the next downstream or downgradient uses – the ability to beneficially use the water would have been impaired, even though water quality objectives would not yet have been exceeded (SWRCB 2011). The contribution of additional metal loads from releases from the proposed Sites Reservoir during the summer would cause concentrations of metals in the Sacramento River (through direct releases or releases through the CBD or GCID) to exceed criteria and standards or at least be subject to the Antidegradation Policy due to an incremental increase in metals in the Sacramento River from the proposed project. Thus, the proposed project may face prohibition of releases if stored water does not meet water quality criteria or standards or if releases can cause criteria or standards to be exceeded by downstream inputs (i.e., Antidegradation Policy).

On page 6-54, page 6-57, and elsewhere, statements concerning expected mercury levels in fish, nutrients, and dissolved organic carbon in the reservoir explain that “this would be an effect on the Project itself occurring within the Sites Reservoir, rather than an effect from the Project on the surrounding environment.” This seems to imply that the project would not be responsible for these issues in the reservoir since it is the location where the reservoir is placed that is responsible. It is the construction of the reservoir that creates the problem. The creation of the reservoir creates a problem for the surrounding environment (i.e., birds that will prey on fish contaminated with high levels of mercury in the reservoir).

The discussion on page 6-57 also explains that “any increases in reservoir nutrient concentrations may benefit fish.” However, management of the mercury problem in the reservoir includes not introducing fish into the reservoir for at least 10 years (Mitigation Measure WQ-1.1). So, there are not any fish that would benefit from the increased nutrient concentrations in the reservoir. Even if there were fish in the reservoir, increased nutrient concentrations would lead to increased HABs (an impact) and anoxia in the hypolimnion as the organic materials (HABs) produced in

the epilimnion sink and decompose in the hypolimnion, eliminating the hypolimnion as habitat for fish (another impact). As well, the anoxic hypolimnion will result in the dissolution of metals from the sediments back into the water column, yet another adverse impact from the increases in reservoir nutrient concentrations.

This section on page 6-54 of the report also acknowledges that long-term methylmercury concentrations in fish in the proposed reservoir can reasonably be expected to be about 0.85 mg/kg ww, which greatly exceeds the 0.2 mg/kg ww of the California sport fish objective.

Because Harmful Algal Blooms (HABs) are expected to be relatively high in surface water of the reservoir (page 6-55), “releases could be made from lower in the water column (e.g., through the low-level intake) to reduce the potential for higher concentrations of cyanobacteria and cyanotoxins to be released downstream.” This is proposed as a strategy on page 6-57 to avoid effects from initial filling of Sites Reservoir on downstream conditions. However, a statement on page 6-16 indicates that water would be released from the surface rather than lower in the water column to avoid releasing water with high concentrations of mercury: “Due to this stratification, reservoir releases from the warmer, upper layer of water (i.e., the epilimnion) during the summer are less likely to have elevated methylmercury concentrations compared to releases from the deeper hypolimnion.” Water quality is affected whether water is released from the surface (HABs) or bottom (mercury). Neither release scenario, then, is effective at mitigating impacts; releases from the bottom to avoid HABs results in high levels of mercury being released, while releases from the surface to avoid mercury results in high levels of HABs being released. One mitigation strategy conflicts with the other. Withdrawing water between the epilimnion and hypolimnion (i.e., the metalimnion) may avoid releasing water with high HABs (epilimnion) or mercury (hypolimnion), but this narrow band of water would quickly be depleted, leaving no option but to release water with either high concentrations of HABs or mercury.

One of the methylmercury management strategies is to not stock Sites Reservoir with fish for the first 10 years following its initial filling (page 6-59). How will the project prevent someone from taking it upon themselves to stock fish of their choosing, as has happened at many other reservoirs (e.g., Northern pike in the Upper Feather River reservoirs). What will the project do to prevent someone from stocking fish and to mitigate this stocking when it does occur?

Another methylmercury management strategy is to introduce an oxidant, such as nitrate, to the reservoir bottom waters (near the sediment-water interface) to reduce anoxia (page 6-59). “If this method is employed, reservoir releases will be made from a higher tier (i.e., higher elevation) in the I/O tower to avoid discharging bottom waters.” Introduction of nitrates will serve as a nutrient source to stimulate increased algal ((HABs) growth following reservoir turnover. Releases from above the hypolimnion will be affected by HABs.

From page 6-70: “Thermal stratification in the summer would likely result in a reduction of oxygen toward the bottom of the reservoir in the hypolimnion. However, reservoir fish would likely not be affected by this reduction because they would not be in the hypolimnion.” According to this DEIR, some of the fish species that would be introduced into the reservoir

(after 10 years) include cold-water species. These fish require the cold water of the hypolimnion for survival. Reduction of oxygen in the hypolimnion will adversely affect these species.

The DEIR on page 6-81 states that “concentrations of metals released from Sites Reservoir could be higher than their concentrations in the Sacramento River at the point of discharge, potentially degrading river water quality.” “The release of Sites Reservoir water to the CBD under Alternatives 1, 2, and 3 would likely reduce metals concentrations in the CBD because metal concentrations in the CBD are generally higher than metals concentrations in the Sacramento River regardless of time of year.” As discussed earlier, release of water to the CBD from Sites reservoir results in elevated concentrations of most metals in the CBD. However, even if release of water from Sites Reservoir to the CBD did not cause metal concentrations in the CBD to be increased, the total volume of poor quality metal laden water being released to the Sacramento River at the CBD outfall is increased with the introduction of water from Sites Reservoir, thereby causing greater adverse impacts on water quality in the Sacramento River than if just CBD water was released. The additional metals load in CBD due to the addition of water from Sites Reservoir may, when combined with other downstream discharges, result in the need for additional water treatment by downstream users, particularly municipal or industrial users.

The DEIR states on page 6-81 that “high concentrations of total metals in the Sacramento River water diverted to storage may be reduced substantially by settling of suspended sediment. This would cause concentrations to drop and approach the dissolved, filtered measurements.” The DEIR does not take in account the dissolution of metals from the settled sediments under the anoxic conditions expected in the reservoir. Dissolution of metals from the settled sediments will add to those already present in the dissolved form. In addition, the DEIR states that evapoconcentration could increase metals concentrations in the reservoir by up to 48 percent.

The DEIR on page 6-82 states that “to demonstrate a range of results for the Sacramento River, these graphs show two types of results for concentrations in the Sacramento River downstream of the Sites discharge: Concentrations assuming median river concentrations mixed with Sites Reservoir concentrations that assume no settling of suspended sediment. This represents typical river concentrations mixed with Sites concentrations that are probably unrealistically high.” Sites Reservoir will not be diverting “median” river concentrations, but rather the higher concentrations occurring with higher flows in the January through March period. Throughout this DEIR, comments are made that analyses are “conservative,” meaning that the DEIR considers worst case scenarios in the analyses. The analyses are not “conservative” at all, but are an underestimation of the concentration of metals that will occur in the reservoir since the available data does not identify the higher concentration of metals that will occur with higher flows.

The DEIR on page 6-82 states that “the total aluminum, total copper, and total iron concentrations in Sites Reservoir are likely to frequently exceed aquatic life protection standards if settling did not reduce these concentrations.” As noted previously, settling of sediments is not a permanent sink for metals in the reservoir. Dissolution of metals under anoxic conditions will allow metals from the sediments to re-enter the water column, which may then lead to even more exceedances of water quality standards for aquatic life protection.

In discussing effects on aquatic communities in the reservoir due to metals, the DEIR on page 6-82 states “these effects would occur on an aquatic community in a reservoir that is not present under existing conditions so there would be no substantial degradation of water quality relative to existing conditions.” Strange statement. There is no degradation under existing conditions without the reservoir, but there are certainly impacts on the aquatic community when the reservoir is constructed. The SWRCB sets water quality standards and objectives that includes reservoirs.

The DEIR on page 6-83 states “acute synergistic metal effects in the river would be greater than what might occur in Sites Reservoir because metal concentrations in the Sacramento River during high flow events are much higher than concentrations expected in Sites Reservoir.” Diversions to Sites Reservoir would occur during high flow events, so metals concentrations in Sites Reservoir would be similar to those in the Sacramento River during these events. The DEIR goes on to state “as described above, once suspended sediment settles in Sites Reservoir, most metals are expected to occur at levels below water quality standards for aquatic life protection, which would limit the likelihood of synergistic effects.” The DEIR considered only four metals, but nonetheless found that “with these assumptions for partial settling, concentrations for total aluminum may be close to the 620 µg/L water quality standard for aquatic life protection, hovering between about 500 µg/L and 750 µg/L” and “total copper concentrations may occasionally exceed water quality standards for aquatic life protection” (page 6-82). This conclusion conflicts with the earlier and does not support the conclusion that most metals are expected to occur at levels below water quality standards for aquatic life protection.

Graphs are presented on pages 6-84 and 6-85 that depict estimated concentrations of various metals going back as far as the year 1920 to the year 2000. There are no metals data for nearly all the years depicted in the graphs, so how were the estimates determined?

The DEIR on page 6-86 states that “arsenic levels measured in the Sacramento River are below regulatory standards.” Arsenic levels in the Sacramento River near Red Bluff as well as at Hamilton City exceed several goals and objectives, including the California Public Health Goal for Drinking Water, USEPA National Recommended WQ Criteria for water and fish consumption, and USEPA National Recommended WQ Criteria for fish consumption. Though not regulatory, these goals are criteria to which arsenic concentrations should be compared to evaluate impacts.

The DEIR states on page 6-88 that “in drought years, releases from the reservoir’s normal operating dead pool would be made through the low-level intake” and on page 6-89 that “if cyanobacteria and cyanotoxins are confirmed near the I/O tower at a level at or exceeding the “Caution” action trigger level, releases could be made from lower in the water column (e.g., through the low-level intake) to reduce the potential for higher concentrations of cyanobacteria and cyanotoxins to be released downstream. This hypolimnial release would result in water with high concentrations of methylmercury being released downstream.

In determining CEQA significance on page 6-92, the DEIR reiterates that “releasing water from lower in the reservoir if cyanobacteria and cyanotoxins are confirmed near the I/O tower at a level at or exceeding the “Caution” action trigger level, would further reduce any potential for

adverse water quality effects,” which ignores the conflicting issue of high methylmercury concentrations in the lower water. The DEIR on page 6-93 also states that “in the Sacramento River, discharges to the river from Sites Reservoir would occur after reductions in total metal concentrations due to settling of suspended sediment. These discharges would not cause substantial increases in concentration or exceedances or exacerbation of exceedances of water quality standards for metals in the Sacramento River.” This ignores the importance of redistribution of metals from the reservoir sediments due to dissolution. Any increases in concentrations or exceedances of water quality standards for metals is a concern for downstream water users, even if not “substantial.”

Mitigation for impacts to Stone Corral Creek include “release occasional pulses of high flow. Flow pulses could flush away low-quality sediment and water from the bottom of the reservoir adjacent to Sites Dam.” This would flush contaminant laden sediments downstream, resulting in downstream impacts including smothering of aquatic habitat with toxics laden sediments. Adding “a vertical extension in the reservoir at the withdrawal point. This extension would pull water from higher in the reservoir, where metal concentrations are expected to be lower” and “pump water from the top of Sites Reservoir for release into Stone Corral Creek.” But HABs are higher in this water that would be supplied from the upper water column of the reservoir – trading one impact for another.

Another mitigation for Stone Corral Creek (page 6-95) is to “pump water from the top of Sites Reservoir for release into Stone Corral Creek. Based on the demonstration of the effect of partial settling of suspended sediment on total metal concentrations in Sites Reservoir and the conservative nature of this assessment, metal concentrations in Sites Reservoir are expected to meet water quality standards for the protection of aquatic life during the drier parts of the year in water located above the deepest portions of the reservoir.” This conflicts with earlier statements in this DEIR (page 6-82) that states “based on the calculations that demonstrate the effect of partial settling of suspended sediments, settling of suspended sediment may have a substantial effect on total metal concentrations. With these assumptions for partial settling, concentrations for total aluminum may be close to the 620 µg/L water quality standard for aquatic life protection, hovering between about 500 µg/L and 750 µg/L (Figure 6-9). Total copper concentrations may occasionally exceed water quality standards for aquatic life protection.” Even higher concentrations could be expected had the effects of dissolution of metals from the sediments been considered in the analysis.

The DEIR on page 6-100 states that “the net effect of the Project would be to enhance beneficial uses of water, and water quality could improve in parts of the study area. For example, during some months the increases in Delta outflow could reduce seawater intrusion and under certain circumstances Alternatives 1, 2, and 3 could allow for seasonal storage changes in Shasta Lake that could help to preserve cold-water supply for fish through exchanges with Sites Project water.” Increased releases from Sites Reservoir to preserve water in Lake Shasta will result in a greater percentage of water in the Sacramento River being composed of Sites Reservoir water, which results in less dilution from Shasta releases, and greater metals concentrations in the Sacramento River.

This section goes on to say “the development of Sites Reservoir for Alternative 1, 2, or 3 would create in-reservoir habitat and thus net benefits for Reservoir cold-water and warm-water fish species.” Cold water fish species would be impacted by the anoxic conditions expected to occur in the hypolimnetic environment required by such fish. In addition, high methylmercury concentrations in the reservoir will impact all fish species. Mitigation for mercury includes not stocking fish for at least 10 years, so there would be no net benefits to cold-water and warm-water fish species for at least 10 years.

This section also states that “operations would increase water supply reliability for refuges, municipalities, and agriculture, particularly in Dry and Critically Dry Water Years.” Though reliability may increase, the quality of water provided by Sites Reservoir may not be suitable for wildlife habitat in refuges and may require additional treatment by municipalities, particularly in dry and critically dry years when less dilution water would be available from existing water projects.

The Sacramento River from Red Bluff to Knights Landing is on the Clean Water Act Section 303(d) Impaired Water Bodies list for PCBs, but there is no discussion in this DEIR about PCBs.

#### Chapter 5. Surface Water Resources

The DEIR on page 5-28 states that “in-lieu exchanges between Sites Reservoir releases and flow in the Sacramento River would occur when Sites Reservoir releases were used to meet local Storage Partner demands (Sacramento River Settlement Contractors, Reclamation, or, most likely, GCID) that normally would be met through diversions from the Sacramento River.” There would be no dilution of water from Sites Reservoir with water from the Sacramento River under such exchanges, and therefore water with higher levels of metals would be supplied to local Storage Partners, particularly GCID, with associated adverse effects. There is no discussion about the adverse effects of such exchanges from metals or other water quality parameters (HABs, cyanotoxins, etc.) to the local water users, including use on wildlife refuges.

The SWRCB is engaged in activities to address the precipitous declines of native aquatic species and the ecosystem they depend upon. These activities include updating the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary to protect the Bay-Delta watershed and its many beneficial uses. The SWRCB is focusing on the Sacramento River and its tributaries, Delta tributaries, Delta outflows, and interior Delta flows. As with the Lower San Joaquin River and Southern Delta update, the SWRCB is concerned about adequate flows in the Sacramento River system to protect instream fish and wildlife, and is proposing Delta inflows of up to 65% of unimpaired flow in the Sacramento River. These updates to the Bay-Delta Plan will reduce the amount of water available for diversion to the proposed Sites Reservoir. There is no discussion about how the reduced flows available for diversion from the Sacramento River due to updates to the Bay-Delta Plan will affect the viability of the proposed Sites Reservoir project.

## Chapter 10. Wildlife Resources

In discussing Impact WILD-1k: Golden Eagle and Bald Eagle, the DEIR states on page 10-96 that “the completed reservoir would provide new bald eagle foraging habitat (fish in the reservoir) and result in new nesting sites or wintering habitat because of the proximity to new foraging habitat. These would be beneficial effects.” There would be no fish in the reservoir for at least 10 years (Mitigation Measure WQ-1.1), so there would be no new bald eagle foraging habitat and no new nesting sites or wintering habitat because of the proximity to new foraging habitat, therefore no beneficial effects. After 10 (or more) years, any fish stocked into the reservoir would develop a mercury burden which would impact fish eating birds, such as the bald eagle.

*CEQA Significance Determination and Mitigation Measures* finds that implementation of Alternative 1 or 3 would have the beneficial effects of providing new bald eagle foraging habitat (Sites Reservoir) and new nesting sites or wintering habitat because of the proximity to the new foraging habitat. As explained above, there is no new foraging habitat or nesting or wintering habitat because there will be no fish in the reservoir for at least 10 years. This is also true for the *NEPA Conclusion* on page 10-99. There is no discussion of any mitigation measures to prevent bald eagles, or other fish eating birds, from ingesting fish contaminated with mercury, or how their populations will be mitigated due to the adverse effects from ingestion of mercury laden fish.

In discussing impacts to various species of bats, the DEIR states that “the completed reservoir would provide a new drinking water source and foraging habitat (insects associated with the reservoir) for bats. This would be a beneficial effect of the Project.” The DEIR does not address the impacts to bats from ingesting water laden with cyanotoxins from HABs in the reservoir, nor the effects of mercury in the insects that the bats would be eating.

DWR 2007. Mercury Contamination in Fish from Northern California Lakes and Reservoirs.  
July 2007

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**From:** Jerry Brown [jbrown@sitesproject.org]  
**Sent:** 7/20/2022 5:08:31 PM  
**To:** Fritz Durst [fdurst@rd108.org]; Alicia Forsythe [aforsythe@sitesproject.org]  
**Subject:** Re: July 21st Agenda Item on Sites

Yes and we have some work to do on this still even though I think this particular group was engaged in our working group on this topic at the end of last year before the EIR went out. This is another example of the listening and changes we made that don't seem to be registering with commenters. In this case, instead of direct releases through Delevan pipeline (which has been eliminated) 100% of returns to the Sac Riv occur after ~40 miles of intermingling with other water, use, and sources. Also there is a careful wq monitoring program included in our commitments.

We'd be happy to meet with them again to discuss.

---

**From:** Fritz Durst <fdurst@rd108.org>  
**Date:** Wednesday, July 20, 2022 at 4:32 PM  
**To:** Jerry Brown <jbrown@sitesproject.org>, Alicia Forsythe <aforsythe@sitesproject.org>  
**Subject:** Fwd: July 21st Agenda Item on Sites

I'm sure you have heard from this Boles guy

Sent from my iPad  
Fritz Durst  
530.304.5111

Begin forwarded message:

**From:** Lewis Bair <LBair@rd108.org>  
**Date:** July 20, 2022 at 4:24:05 PM PDT  
**To:** Fritz Durst <FDurst@rd108.org>, William Vanderwaal <WVanderwaal@rd108.org>  
**Subject:** FW: July 21st Agenda Item on Sites

fyi

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**From:** Barbara Vlamis <barbarav@aqualliance.net>  
**Date:** Wednesday, July 20, 2022 at 4:17 PM  
**To:** Lewis Bair <lbair@rd108.org>  
**Cc:** Jim Brobeck <jimb@aqualliance.net>  
**Subject:** July 21st Agenda Item on Sites

Hi Lewis, I left you a message on your cell. Per that message, here are the attached comments of Jerry Boles, former head of water quality for DWR in Red Bluff, on the Sites' EIS/Rs in 2017 and 2022. Really wanted to make sure you know about the serious water quality implications for Sites and what water from that potential reservoir could do to the land.

Feel free to call me if you would like to speak about this.

Barbara

--  
Barbara Vlamis

Executive Director  
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**From:** Jerry Brown [jbrown@sitesproject.org]  
**Sent:** 7/23/2022 3:18:40 PM  
**To:** Heydinger, Erin [erin.heydinger@hdrinc.com]; Alicia Forsythe [aforsythe@sitesproject.org]; JP Robinette [jrobinette@sitesproject.org]; Kevin Spesert [kspesert@sitesproject.org]  
**CC:** Luu, Henry [Henry.Luu@hdrinc.com]; Spranza, John [john.spranza@hdrinc.com]; Laurie Warner Herson [laurie.warner.herson@phenixenv.com]; mmaltby@brwncald.com  
**Subject:** Re: Schedule for Federal Feasibility Report

Where does current internal schedule come from?

---

**From:** "Heydinger, Erin" <Erin.Heydinger@hdrinc.com>  
**Date:** Friday, July 22, 2022 at 9:30 AM  
**To:** Alicia Forsythe <aforsythe@sitesproject.org>, JP Robinette <jrobinette@sitesproject.org>, Kevin Spesert <kspesert@sitesproject.org>  
**Cc:** "Luu, Henry" <Henry.Luu@hdrinc.com>, "Spranza, John" <john.spranza@hdrinc.com>, Laurie Warner Herson <laurie.warner.herson@phenixenv.com>, "mmaltby@brwncald.com" <mmaltby@brwncald.com>, Jerry Brown <jbrown@sitesproject.org>  
**Subject:** FW: Schedule for Federal Feasibility Report

Hi all,

I received the request below from Jeff Herrin. After working through this with Marcus and Dave, I am suggesting we use the following dates. Note that our latest internal schedule is showing construction through 2032, but I'm not sure we would like to officially proceed with those dates at this point. Therefore, I am recommending we show some delayed dates but still meeting our operations date of 2030.

**Please take a look at your area and let me know how you'd like me to respond.** Should just take a minute. Thank you!

Item	Feasibility Schedule (shown below)	Current Internal Schedule	Recommended for Feasibility Addendum
NEPA/CEQA	Completion end of 2022	ROD signed Feb 2023	Leave as is shown below
Permitting and Water Right	Completion end of 2022 with mitigation and monitoring starting in 2023	End of 2023 for permits, mid-2023 for mitigation/monitoring	Shift to end at end of 2023, have mitigation and monitoring start in 2024. OR Recommend a second line showing mitigation so it can overlap with permitting and begin in 2023.
Preliminary & Final Design	2019-2025	2019-2026	2019-2026
Real Estate	ROE 2019-2020, acquisition 2022	ROE 2019 thru mid-2024 Acquisition mid-2023 thru mid-2029	Divide into two lines. Show rights of entry ending mid-2024 and acquisition mid-2023 through 2028.
Construction	2025-2030	2027-2032	Leave as is OR Shift start to 2026
Start-up	2030	2032-2035	Leave as is

Erin Heydinger PE, PMP  
 D 916.679.8863 M 651.307.9758

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**From:** Herrin, Jeff <jeff.herrin@aecom.com>  
**Sent:** Thursday, July 21, 2022 8:28 AM  
**To:** Heydinger, Erin <erin.heydinger@hdrinc.com>  
**Cc:** Jacobson, Allison M <ajacobson@usbr.gov>  
**Subject:** Schedule for Federal Feasibility Report

CAUTION: [EXTERNAL] This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Erin,

Can you please recommend adjusted dates for the following schedule items?

Thank you,

Phase	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
NEPA/ CEQA			Draft EIR/S		Final EIR/S ROD								
Permitting			Permitting			Mitigation and Monitoring							
Water Rights				Obtain Rights									
Engineering			Preliminary and Final Design										
Real Estate		Right-of-Entry			Real Estate								
Construction								Construction					
Operations													Start - Up

Notes:  
 CEQA = California Environmental Quality Act  
 EIR = Environmental Impact Report  
 EIS = Environmental Impact Statement  
 NEPA = National Environmental Policy Act  
 NOD = Notice of Determination  
 ROD = Record of Decision

Jeff Herrin

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# Preliminary Evaluation of the Planning Aid Memorandum Technical Memorandum



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**To:** Alicia Forsythe, Sites Project Authority  
**CC:** John Spranza, Sites Integration  
Laurie Warner-Herson, Sites Integration  
**Date:** July 14, 2022  
**From:** ICF  
**Quality Review:** Mike Hendrick (ICF)  
**Authority Agent Review:** N/A  
**Subject:** Preliminary Evaluation of the Planning Aid Memorandum

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## 1.0 Purpose

This memorandum presents a preliminary evaluation of the August 5, 2021, Planning Aid Memorandum (PAM) provided by the U.S. Fish and Wildlife Service (USFWS) to the Bureau of Reclamation (Reclamation) for the Sites Reservoir Project (Project). The purpose of the PAM was to provide Reclamation with the USFWS's comments and recommendations regarding the Project's potential effects on biological resources for consideration in project planning and preparation of a public revised draft environmental document. The PAM was prepared under the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 *et seq.*). The Fish and Wildlife Coordination Act requires federal agencies proposing water resource development projects or involved in issuance of related permits or licenses to consult with the USFWS and provide equal consideration to the conservation, rehabilitation, and enhancement of fish and wildlife resources with other project purposes.

The PAM summarized early coordination between USFWS and Reclamation regarding potential effects of the proposed Project. It provided a high-level description of the Project and USFWS's views of potential effects of the inundation of upland habitat (i.e., upland effects), increased diversions of Sacramento River water (i.e., in-river effects), and cumulative impacts associated with implementation of other projects. The PAM also summarized information and early analysis of effects provided to the USFWS by Reclamation and identified areas and concerns where the USFWS indicated that more information or analysis was needed.

The key concerns identified in the PAM are categorized as upland effects (Section 2.0), in-river effects (Section 3.0), and cumulative impacts (Section 4.0). Responses summarizing how each key concern was addressed are provided herein. The Revised Draft Environmental Impact Report/Supplemental Draft Environmental Impact Statement (RDEIR/SDEIS) released in November 2021 contained much of the information to address these key concerns (Sites Project Authority and Bureau of Reclamation 2021). The PAM was developed based on the USFWS's review of the first administrative draft of the RDEIR/SDEIS and there were several substantive changes that occurred between the administrative draft and the publicly released RDEIR/SDEIS, which are explained below. In addition, subsequent analysis

that has been developed to date in preparation of responses to public comments on the RDEIR/SDEIS and for the development of related permitting processes was also used to address the key concerns.

It is important to note that the analysis of the comments on the RDEIR/SDEIS, the response to those comments, and the preparation of the Final EIR/EIS are ongoing. The Authority has recently changed the Project's diversion criteria and has worked with Reclamation since the issuance of the RDEIR/SDEIS to enhance the Project's anadromous species benefits, especially as reflected in the modeling framework. In addition, the Authority has moved from Alternative 1 as its Preferred Project for the purposes of the California Environmental Quality Act compliance to Alternative 3. Revised modeling is underway to reflect these adjustments and once modeling is completed, the Authority and Reclamation look forward to discussing the results and revisions to subsequent species analysis with the USFWS, National Marine Fisheries Service [NMFS], and the California Department of Fish and Wildlife [CDFW]. Therefore, the information and responses in this memorandum may change as these enhanced species protections and species benefits are incorporated into the Project.

## 2.0 Upland Effects

**Key Concern:** Provide greater specificity regarding potential mitigation lands or banks for each of the habitat types for which mitigation is proposed.

**Response:** Given the size of the Project, the Sites Project Authority (Authority) will rely on several mitigation strategies including a mix of mitigation banks and other mitigation mechanisms. The Project's Mitigation and Monitoring Plan (Plan) is under development and will be provided to the USFWS as part of the Project's Biological Assessment (anticipated summer 2022) and Final EIR/EIS (anticipated early 2023). The Plan includes a comprehensive mitigation planning strategy, implementation approach and general criteria for species and habitats based on anticipated Project impacts on regulated biological resources. As access is currently limited to less than 1% of the Project Area, a final analysis of impacts will be conducted once land access is obtained and following the final refinements of Project design and completion of on-the-ground, protocol-level biological field surveys.

Following completion of Project construction, temporary impacts will be mitigated through restoration and revegetation of areas disturbed by construction in accordance with an approved habitat restoration plan. Permanent impacts will be mitigated on site and at agency-approved (USFWS, NMFS, and/or CDFW) offsite locations. Onsite compensatory mitigation may include restoration (re-establishment or rehabilitation), establishment (creation), enhancement, and/or preservation of aquatic or terrestrial biological resources that occur within the proposed Project area. Offsite compensatory mitigation for the proposed Project may include the purchase of agency-approved mitigation/conservation bank credits, the establishment of third party-responsible "turn-key" mitigation/conservation bank projects, preservation of biological resources through conservation easements with private landowners, payments to in-lieu fee programs, or the establishment of permittee-responsible offsite mitigation sites. The methods for assessing resources in the project footprint, best management practices to be applied, tools available for mitigating effects of the Project are discussed in chapters 9 – *Vegetation and Wetland Resources*, and 10 – *Wildlife Resources* of the RDEIR/SDEIS.

The Authority has conferred with USFWS about species habitat models and used this information to estimate mitigation obligations. The Authority expects to continue to work with USFWS and Reclamation as the Project moves forward and better information becomes available to define mitigation requirements.

**Key Concern:** Provide a better description of how increases in Incremental Level 4 refuge water will be provided and the expected benefit to migratory birds.

**Response:** Providing Incremental Level 4 refuge water is an environmental benefit of the Project recognized by the California Water Commission in its authorization of State funding from the Water Storage Investment Program (WSIP). The Authority envisions that CDFW will take an active role in managing the ecosystem water and the Authority would work with CDFW to schedule and adjust releases of ecosystem water to address real-time conditions and needs. The Authority also recognizes that Incremental Level 4 refuge water would be made available to federal refuges north and south of the Sacramento–San Joaquin Delta (Delta) and as such, expects that it would provide Incremental Level 4 water to appropriate destinations based on guidance from, and coordination with the CDFW, USFWS, and Reclamation. The Authority understands that Reclamation and CDFW have an existing methodology to allocate Incremental Level 4 refuge water to the National Wildlife Refuges, State Wildlife Areas, and privately managed wetlands included in Central Valley Project Improvement Act Refuge Water Supply Program. The Authority anticipates that CDFW and Reclamation would allocate the Incremental Level 4 refuge water that results from the Project in the same way they allocate all Incremental Level 4 refuge water.

Table 1 below is from the Authority’s *Water Storage Investment Program: Sites Reservoir Project Continuing Eligibility and Feasibility Determination* report (Authority 2021). It identifies the Project’s Incremental Level 4 refuge water supply benefits in terms of water supply increases to National Wildlife Refuges, State Wildlife Areas, and privately managed wetlands projected in 2030 and 2070 as estimated based on WSIP Unit Water Values. Incremental Level 4 represents the additional increment of water required for optimal wetland habitat development on the National Wildlife Refuges, State Wildlife Areas, and privately managed wetlands included in Central Valley Project Improvement Act Refuge Water Supply Program. The benefits to migratory birds of Incremental Level 4 refuge water supply were identified as part of the original foundational documents of the Central Valley Project Improvement Act and differ for each individual National Wildlife Refuge, State Wildlife Area, and privately managed wetland.

**Table 1. Sites Reservoir Project Incremental Level 4 Refuge Water Supply Increases (2030 and 2070) (TAF/year)**

Period	North-of-the-Delta	South-of-the-Delta <sup>(b)</sup>	Total
<b>2030 Results</b>			
Long-Term Average <sup>(a)</sup>	5	11	17
Wet	0	0	0
Above Normal	9	5	14
Below Normal	9	13	22
Dry	8	27	34
Critical	6	17	23
<b>2070 Results</b>			
Long-Term Average <sup>(a)</sup>	5	10	15
Wet	0	0	0
Above Normal	9	1	10
Below Normal	7	8	16
Dry	7	10	17
Critical	6	21	27

Source: CALSIM II.

Notes:

(a) Average weighted based on water-year frequency rates

(b) Includes both San Joaquin and Tulare Lake Refuge deliveries and based on San Joaquin Valley 60-20-20 Index Year Class.

TAF = thousand acre-feet

**Key Concern:** More thorough analysis is needed of geomorphic effects of flow reduction in the higher flow range on habitat (cut bank formation, cottonwood seed dispersion/regeneration processes, wood transport) and the sensitive species that use it (e.g., bank swallows, yellow-billed cuckoo).

**Response:** The SRH-Meander model results presented in the RDEIR/SDEIS (Chapter 7 – *Fluvial Geomorphology*) suggested that the tendency for meander is not significant among the Project alternatives and the No Action Alternative (NAA). The river meandering, bank erosion, and deposition modeling concluded that there were no significant differences in the channel alignments between existing conditions and the modeled alternatives. Thus, operational impacts on the geomorphic regime (including natural river geomorphic processes such as sediment transport and bank erosion) and existing river geomorphic characteristics (e.g., sinuosity, channel gradient, substrate composition, channel width and depth, and riparian vegetation) of the greater Sacramento River system are expected to be minimal, and consequently, impacts on sensitive species would be negligible or minimal as well. The Authority will review these results with USFWS and Reclamation to determine whether additional analysis is warranted, or additional considerations will be added to the monitoring and adaptive management plans or the Project description.

**Key Concern:** Additional review may be needed of the resource protection measures identified for habitats (e.g., riparian, upland, stream, and wetland) that could support special-status species including the listed valley elderberry longhorn beetle, red-legged frog, and several rare plants, which are potentially present within the impact area.

**Response:** As stated above, verification of species' presence and habitat suitability has been limited by lack of access to lands that would be affected by the Project. Potential wildlife resources in the study area were evaluated by reviewing existing information and identifying potentially suitable habitat with geographic information system modeling. Sources of information and modeling techniques are summarized in Chapter 10, *Wildlife Resources*, of the RDEIR/SDEIS. The Authority will continue to work with Reclamation, USFWS, NMFS, CDFW, and other regulatory agencies to review these results and discuss the resource protection measures, including avoidance and minimization measures. These efforts have been ongoing for some time for aquatic species with more limited discussion on terrestrial species. The Authority with Reclamation would like to engage in more detailed discussion of these concerns with regard to terrestrial species.

### 3.0 In-River Effects

**Key Concern:** Provide a better demonstration of temperature benefit expected from opportunities to increase storage in Shasta Reservoir.

**Response:** In coordination with Reclamation, text was developed to expand the discussion of fisheries benefits related to increased operational flexibility associated with Shasta Reservoir. This text was developed after issuance of the PAM and was included in Chapter 2, *Project Description and Alternatives*, of the RDEIR/SDEIS. Additional water supply from Sites Reservoir would provide opportunities for improved management of salmonid habitat, particularly in the Sacramento River above Red Bluff Diversion Dam. By exchanging Sites Reservoir water for Central Valley Project (CVP) water, Reclamation has an additional tool to maintain and improve habitat for salmonid spawning,

incubation, rearing, and migration. By delivering water to CVP contractors from Sites Reservoir, Reclamation may maintain supply in Shasta Reservoir. Maintenance of supply can then be allocated in real-time management scenarios to uses that protect and enhance anadromous fish benefits, including protecting and enhancing the cold-water pool, which is essential for temperature control in the salmonid spawning reaches below Keswick Dam during Dry and Critically Dry Water Years. Increased storage may provide benefits beyond temperature such as providing a resource for maintaining fall flows to sustain spawning redds that persist in the wetted margins of the Sacramento River. In years when storm events are weak and naturally-occurring pulse flows are minimal, this maintenance of supply could be used to manufacture a spring pulse flow to assist juvenile salmonids in completing their migration from the upper Sacramento River to the Delta and ultimately the Pacific Ocean. The Authority is working with Reclamation to assess and enhance fisheries benefits associated with Reclamation's participation for the multiple objectives related to increased Shasta Reservoir storage.

The Project would also provide an additional capability to address expected changes in precipitation and runoff patterns anticipated to result from climate change (see Chapter 28 of the RDEIR/SDEIS). While long-term averages in precipitation are not expected to change, more precipitation is expected to fall as rain, resulting in a decreased snowpack and changes in runoff patterns. These changes will likely present challenges for future water management, including that for environmental benefits. The ability of the Project to capture and store water that cannot be captured and stored by Reclamation and to exchange water with Shasta Reservoir creates flexibility to provide environmental benefits to anadromous fish in the upper Sacramento River under climate change scenarios.

**Key Concern:** In general, whenever water diversions occur, there will be an associated loss of food organisms and sediment, incidental mortality of fish at the intake screen(s), and lower survival due to lower flows and related mechanisms (predation exposure, less inundated edge cover, less food production, less suspended sediment). Specific concerns expressed are as follows:

- A. Flow criteria at Wilkins Slough (8,000 cfs [cubic feet per second] in April and May; 5,000 cfs in other months) is likely inadequate to protect downstream migrating salmon. Suggest consideration of Michel et al. (2021).
- B. Need more thorough analysis of effects of habitat reduction on survival. Weighted usable area (WUA) curves do not disclose all effects associated with reduced flow.
- C. Need more complete analysis of effects of flow reductions on sturgeon migration.

**Response:**

- A. Wilkins Slough: In response to the concerns expressed in the PAM and the comments on the RDEIR/SDEIS from CDFW and others, the Authority increased the minimum bypass flow requirement at Wilkins Slough during October to June to 10,700 cfs (303 m<sup>3</sup>/s), which is consistent with the step function identified to in Michel et al. (2021) for increased Chinook salmon survival in the Sacramento River. In summary, Michel et al. (2021) looked at the challenge of implementing functional flows to optimize ecosystem improvements given the limited resources. The minimum bypass flow at Wilkins Slough during September remains at 5,000 cfs. The Project will not be diverting water from June 15 to the end of August. Revisions have been made to the Project diversion criteria. These revisions are reflected in Table 2.

**Table 2. Comparison of RDEIR/SDEIS and Revised Diversion Criteria**

Location (Listed from North to South)	RDEIR/SDEIS with Mitigation Included	Revised and Expected in the Final EIR/EIS
Bend Bridge Pulse Protection	Protection of all qualified precipitation-generated pulse events (i.e., peaks in river flow rather than scheduled operational events) from October to May based on the detection of fish presence and migration during the beginning of the flow event. For each event where fish presence and migration is detected, diversions from the Sacramento River would cease for 7 days.	Similar except the following: (1) a qualified precipitation-generated pulse event is determined based on forecasted flows and (2) pulse protection may cease earlier than 7 days if flows at Bend Bridge exceed 29,000 cfs and Project diversions subtracted from Bend Bridge flows continue to be at least 25,000 cfs
Minimum Bypass Flows in the Sacramento River at the RBPP	3,250 cfs minimum bypass flow at all times; rate of diversion controlled by fish screen design	No change
Minimum Bypass Flows in the Sacramento River at the Hamilton City Pump Station	4,000 cfs minimum bypass flow at all times; rate of diversion controlled by fish screen design	No change
Minimum Bypass Flows in the Sacramento River at Wilkins Slough	10,700 cfs in March through May; 5,000 cfs all other times	10,700 cfs October through June; 5,000 cfs September (not diverting from June 15 to end of August)
Fremont Weir Notch Protections	No more than 1% reduction in flow over weir when spill over the weir are less than 600 cfs. No more than a 10% reduction in flow over weir when spills over the weir are between 600 cfs and 6,000 cfs. No restriction when flows over the weir are greater than 6,000 cfs	No longer included. Revised minimum bypass flows in the Sacramento River at Wilkins Slough and Bend Bridge Pulse Protection provide protections for Fremont Weir Notch
Freeport, Net Delta Outflow Index, X2, and Delta Water Quality	Operations consistent with all applicable laws, regulations, biological opinions and incidental take permits, and court orders in place at the time that diversion occurs	No change

Note: This table mimics Table 2-5 in the RDEIR/SDEIS and the Wilkins Slough flow requirements have been incorporated into the Project Description.

The Authority is working with Reclamation to revise the modeling and determination of effects of the Project’s revised operations criteria on fisheries resources. The Authority is also in ongoing conversations with Reclamation, CDFW, NMFS, and USFWS to develop language to describe how these operational requirements will be implemented and develop the associated fish monitoring program.

- A. Upstream habitat: The Authority agrees diverting flow can have effects on habitat volume and available food that are likely more limiting, and not apparent in WUA calculations. The WUA is derived from the CALSIM runs and as such the WUA’s are based on monthly averages that may not accurately reflect real time operations. The analysis in Chapter 11, *Aquatic Biological Resources*, of the RDEIR/SDEIS considers factors such as temperature, flow, and the effects of flow reductions on side channel and floodplain habitats to support its impact determination of less than significant with mitigation for salmonids.

The Authority will revise the CALSIM analysis with the revised diversion criteria and enhanced anadromous fish benefits to reassess the effects on WUA in the Final EIR/EIS. During 2022, the Authority will work with Reclamation, USFWS, NMFS, and CDFW to review the revised modeling and related analyses to assess the adequacy of the analysis and work toward consensus on impact determinations and any measures needed to reduce impacts to less than significant levels (CEQA) and no adverse effects (NEPA).

- B. Sturgeon: Shaffter (1997) reported spawning on white sturgeon in the Sacramento River at flows of about 6,500 to 6,640 cfs (184 to 188 m<sup>3</sup>/s) after observing pulse of about 1,400 cfs (40 m<sup>3</sup>/s) over base flow conditions. This reference appears to be the source for the concern. The Authority's decision to adopt a higher minimum bypass flow at Wilkins Slough and the Project's pulse flow protection measure would ensure the Project diversion do not cause flows to decline below those likely to influence sturgeon migration and spawning.

**Key Concern:** The relationship between pulses and fish movement is not a precise relationship. Longer and more frequent flows may be necessary to protect downstream-migrating juvenile salmon.

**Response:** The Project's pulse protection measure is intended to account for the importance of pulses in stimulating and providing for the redistribution of juvenile fish from their spawning grounds to downstream rearing areas and seaward migration (Poytress 2014, Steel 2020, Michel 2021, Hassrick 2022). The Authority recognizes that the precise relationship between flow pulses and fish movement is not known at this time. As such, the Authority intends to incorporate the pulse protection criteria, and strategies for evaluating the effectiveness of the criteria, into its adaptive management plan to address this uncertainty and continue to refine the criteria as the science and understanding of fish movement is better understood.

**Key Concern:** Need to address pulses as a mechanism to initiate/attract adult salmon and sturgeon up stream.

**Response:** As presented in the RDEIR/SDEIS, the Project is not expected to impede the upstream migration of adult salmon or sturgeon. The proposed pulse flow criteria ensure pulses are protected and propagate downstream. In addition, the revised minimum bypass flow requirement at Wilkins Slough ensures that Project operations do not diminish flows below levels which may interrupt or delay the upstream migration of sturgeon.

**Key Concern:** Provide a better explanation of effects and benefits of fall pulse flows into Yolo Bypass for plankton production and discussion of consequences of reduced flow into the bypass due to reduction in flows attributable to diversions at TCCA and GCID diversions.

**Response:** An analysis of the expected timing and benefit of the Yolo Bypass flow measure to stimulate food production and convey forage species to the north Delta for the benefit of delta smelt (*Hypomesus transpacificus*) and other planktivorous fish is presented in Chapter 11 - *Aquatic Biological Resources*, of the RDEIR/SDEIS. The benefit of this measure has been acknowledged by CDFW in the review of the Project during the California Water Commission's WSIP approval process. An analysis of the consequences of reduced flow into the Yolo Bypass due to reduction in flows attributable to diversions at TCCA and GCID diversions is provided in the section, *Impact FISH-2: Operations Effects on Winter-Run Chinook Salmon, Floodplain Inundation and Access*, in Chapter 11 - *Aquatic Biological Resources*, of the RDEIR/SDEIS, as well as in Appendix 11M. The analysis concludes that Sites diversions result in minor reductions in Yolo Bypass acreages inundated during the winter and spring, but that when the net effect

of all differences between the NAA and Alternatives 1, 2, and 3 are examined, the differences are small and the effect on fish populations is expected to be minor.

**Key Concern:** Address expected increase in loss of fish at South Delta export facilities associated with July through September increases in Delta exports.

**Response:** The effect of moving Sites Reservoir water across the Delta to the Delta export facilities on the location of X2, flows in Old and Middle River, and expected loss at the export facilities are addressed in Chapter 11 - *Aquatic Biological Resources*, and Appendix 5B3, *Delta Operations*, of the RDEIR/SDEIS. The results of these analyses suggest there would be little difference in south Delta loss between the NAA and Alternatives 1, 2, and 3, primarily due to absence of juvenile ESA-listed fish in the Delta between July and September.

**Key Concern:** More thorough analysis may be needed of the effects of exchanges on spawning and rearing habitat in the American and Feather Rivers.

**Response:** The effects of Project operations on temperatures in the American and Feather Rivers are discussed in Chapter 11, *Aquatic Biological Resources*; Appendix 11B, *Upstream Fisheries Impact Assessment Quantitative Methods*; and Appendix 11D, *Fisheries Water Temperature Assessment*, of the RDEIR/SDEIS. The results indicate impacts from changes in temperatures are less than significant. The effects of Project operations on availability of spawning and rearing habitat in the American and Feather Rivers are also analyzed in Chapter 11 and Appendix 11K, *Weighted Usable Area Analysis*, of the RDEIR/SDEIS. The analysis suggests no significant differences between Alternatives 1, 2, and 3 and the NAA with respect to WUA. An analysis of the potential redd dewatering in the American and Feather Rivers was also conducted and discussed in Chapter 11. The results of that analysis suggested no significant differences among the alternatives and the NAA.

These analyses will be revised to reflect the revised diversion criteria and enhanced anadromous fish benefits in revised CALSIM and other model runs. Once the updated modeling is completed, the Authority will be available to present and discuss those results with Reclamation, USFWS, NMFS, CDFW and the other regulatory agencies.

## 4.0 Cumulative Impacts with Other Projects

**Key Concern:** Reclamation should consider the benefits of these other projects, how they would interact with the Project, and explain the sequence of construction/completion relative to the Project.

**Response:** The Authority understands the interest in exploring how the Project may operate in conjunction with other projects such as the revised Delta Conveyance Project and the Shasta Raise Project. However, these projects are presently not sufficiently developed to assess how they would be constructed and operated, and any analysis of cumulative effects would be speculative. The Authority thinks adding speculative results to the cumulative effects analysis could be misleading; therefore, it does not plan to pursue such an analysis. For additional details, refer to Chapter 31, *Cumulative Impacts*, in the RDEIR/SDEIS. Chapter 31 states "The cumulative analysis is primarily qualitative. The cumulative analysis qualitatively addresses projects listed in Table 31-1, such as Delta Conveyance Project. For many of the projects in Table 31-1 it would be speculative to define multiple parameters and assumptions within a numerical modeling effort."

## 5.0 References

- Hassrick, J.L., A.J. Ammann, R.W. Perry, S.N. John, and M.E. Daniels, 2022. Factors affecting spatiotemporal variation in survival of endangered winter-run Chinook salmon out-migrating from the Sacramento River. *N. Am. J. of Fish. Man.* <https://doi.org/10.1002/NAFM.10748>
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- Poytress, W. R., J. J. Gruber, F. D. Carrillo, and S. D. Voss. 2014. *Compendium Report of Red Bluff Diversion Dam Rotary Screw Trap Juvenile Anadromous Fish Production Indices for Years 2002–2012*. Prepared for California Department of Fish and Wildlife Ecosystem Restoration Program and the U.S. Bureau of Reclamation. July. U.S. Fish and Wildlife Service, Red Bluff, CA.
- Schaffter, R. G. 1997. White Sturgeon spawning migrations and location of spawning habitat in the Sacramento River, California. *Calif Fish Game* 83(1):1-20.
- Sites Project Authority. December 2021. Water Storage Investment Program: Sites Reservoir Project Continuing Eligibility and Feasibility Determination. Available: [https://cwc.ca.gov/-/media/CWC-Website/Files/Documents/2021/12\\_December/December2021\\_Item\\_10\\_SitesFeasibility\\_Final.pdf](https://cwc.ca.gov/-/media/CWC-Website/Files/Documents/2021/12_December/December2021_Item_10_SitesFeasibility_Final.pdf)
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- Steel, A.E., Anderson, J.J., Mulvey, B., & Smith, D.L. (2020). Applying the mean free-path length model to juvenile Chinook salmon migrating in the Sacramento River, California. *Environmental Biology of Fishes*, 103, 1603-1617. <https://doi.org/10.1007/s10641-020-01046-8>

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**From:** Heydinger, Erin [Erin.Heydinger@hdrinc.com]  
**Sent:** 7/24/2022 10:15:13 AM  
**To:** Jerry Brown [jbrown@sitesproject.org]; Alicia Forsythe [aforsythe@sitesproject.org]; JP Robinette [jrobinette@sitesproject.org]; Kevin Spesert [kspesert@sitesproject.org]  
**CC:** Luu, Henry [Henry.Luu@hdrinc.com]; Spranza, John [john.spranza@hdrinc.com]; Laurie Warner Herson [laurie.warner.herson@phenixenv.com]; mmaltby@brwncald.com  
**Subject:** Re: Schedule for Federal Feasibility Report

Current internal is based on the P6 schedule controls updates bimonthly. I do not believe construction schedule incorporates the latest contract strategy, but Marcus or Henry can confirm.

Erin

Erin Heydinger, PE, PMP  
Project Manager  
651-307-9758

---

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**Sent:** Saturday, July 23, 2022 3:18:40 PM  
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**From:** "Heydinger, Erin" <Erin.Heydinger@hdrinc.com>  
**Date:** Friday, July 22, 2022 at 9:30 AM  
**To:** Alicia Forsythe <aforsythe@sitesproject.org>, JP Robinette <jrobinette@sitesproject.org>, Kevin Spesert <kspesert@sitesproject.org>  
**Cc:** "Luu, Henry" <Henry.Luu@hdrinc.com>, "Spranza, John" <john.spranza@hdrinc.com>, Laurie Warner Herson <laurie.warner.herson@phenixenv.com>, "mmaltby@brwncald.com" <mmaltby@brwncald.com>, Jerry Brown <jbrown@sitesproject.org>  
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**Please take a look at your area and let me know how you'd like me to respond.** Should just take a minute. Thank you!

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Construction	2025-2030	2027-2032	Leave as is OR Shift start to 2026
Start-up	2030	2032-2035	Leave as is

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**From:** Herrin, Jeff <jeff.herrin@aecom.com>  
**Sent:** Thursday, July 21, 2022 8:28 AM  
**To:** Heydinger, Erin <erin.heydinger@hdrinc.com>  
**Cc:** Jacobson, Allison M <ajacobson@usbr.gov>  
**Subject:** Schedule for Federal Feasibility Report

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Erin,

Can you please recommend adjusted dates for the following schedule items?

Thank you,

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Year	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	
NEPA/ CEQA			Draft EIR/S		Final EIR/S ROD									
Permitting		Permitting				Mitigation and Monitoring								
Water Rights			Obtain Rights											
Engineering		Preliminary and Final Design												
Real Estate		Right-of-Entry			Real Estate									
Construction								Construction						
Operations														Start - Up

Notes:  
 CEQA = California Environmental Quality Act  
 EIR = Environmental Impact Report  
 EIS = Environmental Impact Statement  
 NEPA = National Environmental Policy Act  
 NOD = Notice of Determination  
 ROD = Record of Decision

**Jeff Herrin**

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# Bi-Weekly Sites-USBR Coordination Draft Agenda



Affordable Water, Sustainably Managed

*Our Core Values – Safety, Trust and Integrity, Respect for Local Communities, Environmental Stewardship, Shared Responsibility and Shared Benefits, Accountability and Transparency, Proactive Innovation, Diversity and Inclusivity  
Our Commitment – To live up to these values in everything we do*

## Meeting Participants:

**Date:** July 26, 2022      **Location:** Join Microsoft Teams Meeting

**Start Time:** 3:00 p.m.      **Finish Time:** 4:00 p.m.

**Purpose:** Coordinate activities related to planning and permitting of the Sites Reservoir Project. This is a standing bi-weekly meeting.

## Meeting Participants:

Jerry Brown, Sites	Richard Welsh, Bureau	Levi Johnson, Bureau	Luke Davis, Bureau
Ali Forsythe, Sites	Don Bader, Bureau	Jobaid Kabir, Bureau	Michael Mosley, Bureau
Erin Heydinger, Sites	Allison Jacobson, Bureau	Stacey Leigh, Bureau	Melissa Dekar, Bureau
Laurie Warner Herson, Sites	Vanessa King, Bureau	Mark Carper, Bureau	Susanne Manugian, Bureau
John Spranza, Sites	Natalie Taylor, Bureau	Shane Hunt, Bureau	Austin Olah, Bureau
Henry Luu, Sites	Gregory Mongano, Bureau	Darryl Good, Bureau	Kevin Jacobs, Bureau
	Mark Morberg, Bureau		

Discussion Topic	Topic Leader	Time
1. Introductions	All	
2. Follow-up on action items from the last meeting		1 min
3. EIR/EIS, Permitting, Operations		20 min
4. Financial Assistance		20 min
5. Other Activities		10 min
6. Review of Action Items		As time allows

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**Sent:** 7/25/2022 8:00:59 AM  
**To:** Heydinger, Erin [erin.heydinger@hdrinc.com]; Jerry Brown [jbrown@sitesproject.org]; JP Robinette [jrobinette@sitesproject.org]; Kevin Spesert [kspesert@sitesproject.org]  
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**Subject:** RE: Schedule for Federal Feasibility Report

Thanks Erin. I think your recommendations look good for planning and permitting. See my highlighting below.

Ali

-----  
Alicia Forsythe | Environmental Planning and Permitting Manager | Sites Project Authority | 916.880.0676 |  
[aforsythe@sitesproject.org](mailto:aforsythe@sitesproject.org) | [www.SitesProject.org](http://www.SitesProject.org)

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**Sent:** Sunday, July 24, 2022 10:15 AM  
**To:** Jerry Brown <jbrown@sitesproject.org>; Alicia Forsythe <aforsythe@sitesproject.org>; JP Robinette <jrobinette@sitesproject.org>; Kevin Spesert <kspesert@sitesproject.org>  
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Jeff Herrin

VP, Water Resources Planner - Northern California Region, US West Water  
M +1-916-432-0956  
[jeff.herrin@aecom.com](mailto:jeff.herrin@aecom.com)

AECOM  
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Delivering a better world  
[LinkedIn](#) | [Twitter](#) | [Facebook](#) | [Instagram](#)



---

**From:** JP Robinette [jrobinette@sitesproject.org]  
**Sent:** 7/25/2022 8:45:22 AM  
**To:** Alicia Forsythe [aforsythe@sitesproject.org]; Heydinger, Erin [erin.heydinger@hdrinc.com]; Jerry Brown [jbrown@sitesproject.org]; Kevin Spesert [kspesert@sitesproject.org]  
**CC:** Luu, Henry [Henry.Luu@hdrinc.com]; Spranza, John [john.spranza@hdrinc.com]; Laurie Warner Herson [laurie.warner.herson@phenixenv.com]; mmaltby@brwncald.com  
**Subject:** Re: Schedule for Federal Feasibility Report

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**Sent:** Monday, July 25, 2022 8:00 AM  
**To:** Heydinger, Erin <erin.heydinger@hdrinc.com>; Jerry Brown <jbrown@sitesproject.org>; JP Robinette <jrobinette@sitesproject.org>; Kevin Spesert <kspesert@sitesproject.org>  
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**From:** Kevin Spesert [kspesert@sitesproject.org]  
**Sent:** 7/25/2022 8:54:08 AM  
**To:** Heydinger, Erin [erin.heydinger@hdrinc.com]; JP Robinette [jrobinette@sitesproject.org]; Alicia Forsythe [aforsythe@sitesproject.org]; Jerry Brown [jbrown@sitesproject.org]  
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My comments in blue

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**From:** Kevin Spesert [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=DEF2E3FB8FBE4310BB65B7A20F658C0F-KSPESERT000]  
**Sent:** 7/25/2022 8:54:08 AM  
**To:** Heydinger, Erin [Erin.Heydinger@hdrinc.com]; JP Robinette [jrobinette@sitesproject.org]; Alicia Forsythe [aforsythe@sitesproject.org]; Jerry Brown [jbrown@sitesproject.org]  
**CC:** Luu, Henry [henry.luu@hdrinc.com]; Spranza, John [john.spranza@hdrinc.com]; Laurie Warner Herson [laurie.warner.herson@phenixenv.com]; mmaltby@brwncald.com  
**Subject:** RE: Schedule for Federal Feasibility Report

My comments in blue

---

**From:** Heydinger, Erin <Erin.Heydinger@hdrinc.com>  
**Sent:** Monday, July 25, 2022 8:47 AM  
**To:** JP Robinette <jrobinette@sitesproject.org>; Alicia Forsythe <aforsythe@sitesproject.org>; Jerry Brown <jbrown@sitesproject.org>; Kevin Spesert <kspesert@sitesproject.org>  
**Cc:** Luu, Henry <henry.luu@hdrinc.com>; Spranza, John <john.spranza@hdrinc.com>; Laurie Warner Herson <laurie.warner.herson@phenixenv.com>; mmaltby@brwncald.com  
**Subject:** RE: Schedule for Federal Feasibility Report

Great, thanks all!

Kevin – please let me know your thoughts on real estate and I can get this back to Jeff.

Erin

Erin Heydinger PE, PMP  
D 916.679.8863 M 851.307.9758

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**From:** JP Robinette <jrobinette@sitesproject.org>  
**Sent:** Monday, July 25, 2022 8:45 AM  
**To:** Alicia Forsythe <aforsythe@sitesproject.org>; Heydinger, Erin <erin.heydinger@hdrinc.com>; Jerry Brown <jbrown@sitesproject.org>; Kevin Spesert <kspesert@sitesproject.org>  
**Cc:** Luu, Henry <Henry.Luu@hdrinc.com>; Spranza, John <john.spranza@hdrinc.com>; Laurie Warner Herson <laurie.warner.herson@phenixenv.com>; mmaltby@brwncald.com  
**Subject:** Re: Schedule for Federal Feasibility Report

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My comments are below, highlighted green.

---

**From:** Alicia Forsythe <aforsythe@sitesproject.org>  
**Sent:** Monday, July 25, 2022 8:00 AM  
**To:** Heydinger, Erin <erin.heydinger@hdrinc.com>; Jerry Brown <jbrown@sitesproject.org>; JP Robinette <jrobinette@sitesproject.org>; Kevin Spesert <kspesert@sitesproject.org>  
**Cc:** Luu, Henry <Henry.Luu@hdrinc.com>; Spranza, John <john.spranza@hdrinc.com>; Laurie Warner Herson <laurie.warner.herson@phenixenv.com>; mmaltby@brwncald.com <mmaltby@brwncald.com>  
**Subject:** RE: Schedule for Federal Feasibility Report

Thanks Erin. I think your recommendations look good for planning and permitting. See my highlighting below.

Ali

-----  
Alicia Forsythe | Environmental Planning and Permitting Manager | Sites Project Authority | 916.880.0676 |  
[aforsythe@sitesproject.org](mailto:aforsythe@sitesproject.org) | [www.SitesProject.org](http://www.SitesProject.org)

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-----  
**From:** Heydinger, Erin <[Erin.Heydinger@hdrinc.com](mailto:Erin.Heydinger@hdrinc.com)>  
**Sent:** Sunday, July 24, 2022 10:15 AM  
**To:** Jerry Brown <[jbrown@sitesproject.org](mailto:jbrown@sitesproject.org)>; Alicia Forsythe <[aforsythe@sitesproject.org](mailto:aforsythe@sitesproject.org)>; JP Robinette <[jrobinette@sitesproject.org](mailto:jrobinette@sitesproject.org)>; Kevin Spesert <[kspesert@sitesproject.org](mailto:kspesert@sitesproject.org)>  
**Cc:** Luu, Henry <[Henry.Luu@hdrinc.com](mailto:Henry.Luu@hdrinc.com)>; Spranza, John <[john.spranza@hdrinc.com](mailto:john.spranza@hdrinc.com)>; Laurie Warner Herson <[laurie.warner.herson@phenixenv.com](mailto:laurie.warner.herson@phenixenv.com)>; [mmaltby@brwncald.com](mailto:mmaltby@brwncald.com)  
**Subject:** Re: Schedule for Federal Feasibility Report

Current internal is based on the P6 schedule controls updates bimonthly. I do not believe construction schedule incorporates the latest contract strategy, but Marcus or Henry can confirm.

Erin

Erin Heydinger, PE, PMP  
Project Manager  
651-307-9758

-----  
**From:** Jerry Brown <[jbrown@sitesproject.org](mailto:jbrown@sitesproject.org)>  
**Sent:** Saturday, July 23, 2022 3:18:40 PM  
**To:** Heydinger, Erin <[erin.heydinger@hdrinc.com](mailto:erin.heydinger@hdrinc.com)>; Alicia Forsythe <[aforsythe@sitesproject.org](mailto:aforsythe@sitesproject.org)>; JP Robinette <[jrobinette@sitesproject.org](mailto:jrobinette@sitesproject.org)>; Kevin Spesert <[kspesert@sitesproject.org](mailto:kspesert@sitesproject.org)>  
**Cc:** Luu, Henry <[Henry.Luu@hdrinc.com](mailto:Henry.Luu@hdrinc.com)>; Spranza, John <[john.spranza@hdrinc.com](mailto:john.spranza@hdrinc.com)>; Laurie Warner Herson <[laurie.warner.herson@phenixenv.com](mailto:laurie.warner.herson@phenixenv.com)>; [mmaltby@brwncald.com](mailto:mmaltby@brwncald.com) <[mmaltby@brwncald.com](mailto:mmaltby@brwncald.com)>  
**Subject:** Re: Schedule for Federal Feasibility Report

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Where does current internal schedule come from?

-----  
**From:** "Heydinger, Erin" <[Erin.Heydinger@hdrinc.com](mailto:Erin.Heydinger@hdrinc.com)>  
**Date:** Friday, July 22, 2022 at 9:30 AM  
**To:** Alicia Forsythe <[aforsythe@sitesproject.org](mailto:aforsythe@sitesproject.org)>, JP Robinette <[jrobinette@sitesproject.org](mailto:jrobinette@sitesproject.org)>, Kevin Spesert <[kspesert@sitesproject.org](mailto:kspesert@sitesproject.org)>  
**Cc:** "Luu, Henry" <[Henry.Luu@hdrinc.com](mailto:Henry.Luu@hdrinc.com)>, "Spranza, John" <[john.spranza@hdrinc.com](mailto:john.spranza@hdrinc.com)>, Laurie Warner Herson <[laurie.warner.herson@phenixenv.com](mailto:laurie.warner.herson@phenixenv.com)>, "[mmaltby@brwncald.com](mailto:mmaltby@brwncald.com)" <[mmaltby@brwncald.com](mailto:mmaltby@brwncald.com)>, Jerry Brown <[jbrown@sitesproject.org](mailto:jbrown@sitesproject.org)>  
**Subject:** FW: Schedule for Federal Feasibility Report

Hi all,

I received the request below from Jeff Herrin. After working through this with Marcus and Dave, I am suggesting we use the following dates. Note that our latest internal schedule is showing construction through 2032, but I'm not sure we would like to officially proceed with those dates at this point. Therefore, I am recommending we show some delayed dates but still meeting our operations date of 2030.

**Please take a look at your area and let me know how you'd like me to respond.** Should just take a minute. Thank you!

Item	Feasibility Schedule (shown below)	Current Internal Schedule	Recommended for Feasibility Addendum
NEPA/CEQA	Completion end of 2022	ROD signed Feb 2023	Leave as is shown below
Permitting and Water Right	Completion end of 2022 with mitigation and monitoring starting in 2023	End of 2023 for permits, mid-2023 for mitigation/monitoring	Shift to end at end of 2023, have mitigation and monitoring start in 2024. OR Shift permitting to end at end of 2023 and Recommend a second line showing mitigation so it can overlap with permitting and begin in 2023.
Preliminary & Final Design	2019-2025	2019-2026	2019-2026 (agreed)
Real Estate	ROE 2019-2020, acquisition 2022	ROE 2019 thru mid-2024 Acquisition mid-2023 thru mid-2029	Divide into two lines. Show rights of entry ending mid-2024 and acquisition mid-2023 through 2028.  ROE should go thru the end of 2024. Early acquisition (Options) thru 2024. Acquisition should be tied to water right and interim financing
Construction	2025-2030	2027-2032	Leave as is OR Shift start to 2026
Start-up	2030	2032-2035	Leave as is

Erin Heydinger PE, PMP  
D 916.679.8863 M 651.307.9758

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**From:** Herrin, Jeff <[jeff.herrin@aecom.com](mailto:jeff.herrin@aecom.com)>  
**Sent:** Thursday, July 21, 2022 8:28 AM  
**To:** Heydinger, Erin <[erin.heydinger@hdrinc.com](mailto:erin.heydinger@hdrinc.com)>  
**Cc:** Jacobson, Allison M <[ajacobson@usbr.gov](mailto:ajacobson@usbr.gov)>  
**Subject:** Schedule for Federal Feasibility Report

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Erin,

Can you please recommend adjusted dates for the following schedule items?

Thank you,

Phase	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
NEPA/ CEQA			Draft EIR/S		Final EIR/S ROD								
Permitting		Permitting				Mitigation and Monitoring							
Water Rights			Obtain Rights										
Engineering		Preliminary and Final Design											
Real Estate		Right-of-Entry		Real Estate									
Construction							Construction						
Operations													Start - Up

NEPA = National Environmental Policy Act  
 CEQA = California Environmental Quality Act  
 EIR = Environmental Impact Report  
 EIS = Environmental Impact Statement  
 NEPA = National Environmental Policy Act  
 NOO = Notice of Determination  
 ROD = Record of Decision

Jeff Herrin

VP, Water Resources Planner - Northern California Region, US West Water  
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## **Sites Reservoir Community Work Group Approach Overview - 7.25.22**

Construction of the Sites Reservoir Project is expected to begin in 2024. Construction activities and later operation of the reservoir are projected to bring jobs and new opportunities to the region, boosting the local economy. Community concerns about reservoir construction and operations include, but aren't limited to, increased traffic through Maxwell and school zones, increased demand for public safety services, and potential loss of the "small town" feel. Some of concerns were highlighted during the recent environmental analysis process, but the Revised Environmental Impact Report is not expected to delve into solutions for all areas of community concern.

Regardless, there may be some creative ways to lessen local impacts, even those considered unavoidable. With that in mind, the Sites Project Authority is interested in establishing a community work group to identify local issues of concern— like traffic, public safety, recreation, and jobs/economy – and potential solutions. The primary goal is to minimize impacts while providing the greatest possible benefit to residents and businesses in Maxwell, Ladoga and surrounding region.

The work group would be convened in late summer 2022. The Authority will strive to ensure broad representation from stakeholder groups, which may include – but are not limited to:

- Colusa County Public Works
- Glenn County Public Works
- Yolo County Public Works
- Knights Landing Drainage District
- Maxwell Unified School District
- Maxwell Fire Protection District
- Maxwell Public Utility District
- Maxwell Park & Recreation District
- Cachil Dehe Band of Wintun Indians
- Yocha Dehe Wintun Nation
- Colusa County Chamber of Commerce
- Sacramento Valley Museum
- Colusa County Historical Society
- Local business (e.g. Maxwell Inn)
- American Legion

For the work group to be successful, the Authority must provide a clear process for input and expected outcomes, limit input to areas that can be influenced, and commit resources for meetings and communications. A group charter will outline Authority and committee member responsibilities and be finalized with input from committee members. The charter will include expectations for frequency of meetings, communication protocols, meeting conduct, roles and responsibilities, and processes for decision making and conflict resolution.

The first meeting is critical to establishing the foundation for future work group activities. The agenda should include a high-level overview of the project and status, the purpose and need for the work group, identification of work group members' hierarchy of concerns, a discussion on

the charter, and an agreement for the first priority focus area for the next meeting (e.g. traffic). It's advised that each priority area be "closed out" as completely as possible before another area is brought forward for discussion.

---

**From:** Alicia Forsythe [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=A6CDF06A7E904B65BAA21702A82AD329-AFORSYTHE]  
**Sent:** 7/26/2022 9:04:56 AM  
**To:** Spranza, John [john.spranza@hdrinc.com]; Briard, Monique [Monique.Briard@icf.com]  
**Subject:** FW: [EXTERNAL] WaterFix BA and USFWS BO

-----  
Alicia Forsythe | Environmental Planning and Permitting Manager | Sites Project Authority | 916.880.0676 | [aforsythe@sitesproject.org](mailto:aforsythe@sitesproject.org) | [www.SitesProject.org](http://www.SitesProject.org)

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**From:** Alicia Forsythe  
**Sent:** Thursday, July 21, 2022 9:41 AM  
**To:** Affonso, Jana <jana\_Affonso@fws.gov>; Hunt, Shane D <shunt@usbr.gov>  
**Subject:** RE: [EXTERNAL] WaterFix BA and USFWS BO

Hi Jana – Apologies for the delay in getting back to you on this. I wanted to spend some time reading through the WaterFix BA and BiOp. Your suggestions below would work for the Authority. Some of what you suggest isn't quite what our members want to see, but with a little time, I think I can get them to be comfortable with a different approach. We can adjust and make these all work.

I read through a good portion of the WaterFix BA and BiOps (not all as it is a lot of material!), but I think the approach taken there is what we are trying to follow and mimic. I see that we might need to make some adjustments, like the reconsultation triggers by species, but these seem totally doable and we would be comfortable with this.

We'd love to talk more about this with you and the USFWS team. We are currently reviewing the Sites Admin Draft BA, which if Reclamation is comfortable with, we'd be happy to share with you and your team also.

I believe you and Shane were going to chat this week or next. Would it make sense to set up a call with all of us later next week? I can keep this to just me from the Authority's side and maybe we can chat about all of this along with where to go from here.

Ali

-----  
Alicia Forsythe | Environmental Planning and Permitting Manager | Sites Project Authority | 916.880.0676 | [aforsythe@sitesproject.org](mailto:aforsythe@sitesproject.org) | [www.SitesProject.org](http://www.SitesProject.org)

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Sites\_ICF\_InternalSchedule\_07262022

ID	Task Name	Duration	Start	Finish	Predecessors	Workday Countdown	% Complete
1	<b>Sites Reservoir Project Schedule for Task Order Amd 3</b>	<b>1895 days</b>	<b>Thu 7/1/21</b>	<b>Wed 10/4/28</b>			<b>15%</b>
2	<b>NEPA/CEQA Process</b>	<b>419 days</b>	<b>Fri 11/12/21</b>	<b>Wed 6/21/23</b>			<b>48%</b>
3	<b>Revised RDEIR/SDEIS Public Release</b>	<b>56 days</b>	<b>Fri 11/12/21</b>	<b>Fri 1/28/22</b>			<b>100%</b>
10	<b>Prepare Final EIS/EIR</b>	<b>403 days</b>	<b>Mon 12/6/21</b>	<b>Wed 6/21/23</b>			<b>38%</b>
11	<b>Volume 3 Response to comments (Schedule assumes 151 comment letters; 895 comments)</b>	<b>247 days</b>	<b>Mon 12/6/21</b>	<b>Tue 11/15/22</b>			<b>52%</b>
12	Authority/Integration post comment letters to SharePoint daily (101 letters received & as of 2/22 -1,053 comments)	45 days	Mon 12/6/21	Fri 2/4/22	6FF+5 days		100%
13	ICF review, categorize, and enter comments into database (Generate RTC tables)	49 days	Wed 12/15/21	Mon 2/21/22	6SS		100%
14	Prepare Response to Comment Guidance (Distinguish between substantive and non-substantive comments &	6 days	Mon 1/31/22	Mon 2/7/22	6		100%
15	Authority/Legal/Reclamation review RTC Guidance	8 days	Tue 2/8/22	Thu 2/17/22	14		100%
16	ICF revise RTC Guidance	8 days	Fri 2/18/22	Tue 3/1/22	15		100%
17	ICF prepare Draft Vol 3 Introduction (Driven by approval of the Guidance Document & Generally includes stats re	10 days	Fri 2/18/22	Thu 3/3/22	16SS		100%
18	Authority/Legal/Reclamation review of Draft Vol 3 Introductio	8 days	Fri 3/4/22	Tue 3/15/22	17		100%
19	ICF prepare draft outlines of Master Responses (Based on review of comment response tables)	30 days	Tue 2/22/22	Mon 4/4/22	13		100%
20	Authority/Legal/Reclamation review of draft outlines of Master Responses	18 days	Tue 4/5/22	Thu 4/28/22	19		100%
21	<b>Preparation of draft Master Responses &amp; Action Code Tables</b>	<b>127 days</b>	<b>Fri 4/29/22</b>	<b>Mon 10/24/22</b>	<b>20</b>	<b>22</b>	<b>0%</b>
22	<b>Batch 1 - MR 1, 6, 7 &amp; 9 and associated Action Code Tables</b>	<b>83 days</b>	<b>Fri 4/29/22</b>	<b>Tue 8/23/22</b>			<b>0%</b>
23	ICF submit MRs & Action Code Tables to Integration and Reclamation (including BDO &/or Solicitors office, as	61 days	Fri 4/29/22	Fri 7/22/22	20		0%
24	Integration, Legal, Authority and Reclamation review Bat	10 days	Mon 7/25/22	Fri 8/5/22	23	9	0%
25	Integration consolidates and resolves conflicting comments to send to ICF	2 days	Mon 8/8/22	Tue 8/9/22	24	11	0%
26	ICF updates MR and Action Code Tables & CAT Team inputs responses into database & produces draft RTC tables for each letter	10 days	Wed 8/10/22	Tue 8/23/22	25	21	0%
27	<b>Batch 2 - ICF submit MR 2 &amp; 8 and associated Action Code</b>	<b>28 days</b>	<b>Wed 8/10/22</b>	<b>Fri 9/16/22</b>			<b>0%</b>
28	ICF reviews comments received on Batch 1 for global edits that need to be made to Batch 2	5 days	Wed 8/10/22	Tue 8/16/22	20,25	16	0%

Sites\_ICF\_InternalSchedule\_07262022

ID	Task Name	Duration	Start	Finish	Predecessors	Workday Countdown	% Complete
29	ICF submit MRs & Action Code Tables to Integration and Reclamation (including BDO &/or Solicitors office)	1 day	Wed 8/17/22	Wed 8/17/22	28	17	0%
30	Integration, Legal, Authority and Reclamation review Batch 1	10 days	Thu 8/18/22	Wed 8/31/22	29	27	0%
31	Integration consolidates and resolves conflicting comments to send to ICF	2 days	Thu 9/1/22	Fri 9/2/22	30	29	0%
32	ICF updates MR and Action Code Tables & CAT Team inputs responses into database & produces draft RTC tables for each letter	10 days	Mon 9/5/22	Fri 9/16/22	31	39	0%
33	<b>Batch 3 - ICF submit MR 3, 4 &amp; 5 and associated Action Code Tables</b>	<b>54 days</b>	<b>Wed 8/10/22</b>	<b>Mon 10/24/22</b>			<b>0%</b>
34	ICF reviews comments received on Batch 1 for global edits that need to be made to Batch 2	5 days	Wed 8/10/22	Tue 8/16/22	25	16	0%
35	Jacobs completes MR3 and associated Action Code Table	0 days	Fri 9/2/22	Fri 9/2/22		28	0%
36	ICF submit MRs & Action Code Tables to Integration and Reclamation (including BDO &/or Solicitors office)	15 days	Fri 9/2/22	Thu 9/22/22	20,34,35	43	0%
37	Integration, Legal, Authority and Reclamation review Batch 2	10 days	Fri 9/23/22	Thu 10/6/22	36	53	0%
38	Integration consolidates and resolves conflicting comments to send to ICF	2 days	Fri 10/7/22	Mon 10/10/22	37	55	0%
39	ICF updates MR and Action Code Tables & CAT Team inputs responses into database & produces draft RTC tables for each letter	10 days	Tue 10/11/22	Mon 10/24/22	38	65	0%
40	Final review and cross check of Action Code Tables	10 days	Tue 10/25/22	Mon 11/7/22	39,26,32	75	0%
41	ICF CAT Team generates letter tables & QA/QC for Volume 3	6 days	Tue 11/8/22	Tue 11/15/22	40	81	0%
42	<b>Volumes 1 &amp; 2 Admin Draft Final EIR/EIS</b>	<b>141 days</b>	<b>Fri 4/8/22</b>	<b>Fri 10/21/22</b>			<b>58%</b>
43	<b>Receive revised modeling for Alts 1A, 1B and 3A (25% without climate change) to complete RTC &amp; Update</b>	<b>66 days</b>	<b>Fri 4/8/22</b>	<b>Fri 7/8/22</b>		<b>29</b>	<b>81%</b>
44	Jacobs provides to ICF CalSim Modeling	6 wks	Fri 4/8/22	Thu 5/19/22			100%
45	Jacobs provides to ICF USRDOM Upper Sac daily flow data	12 days	Fri 5/20/22	Mon 6/6/22	44		100%
46	Jacobs provides to ICF Anderson-Martin Egg Mortality	5.4 wks	Fri 5/20/22	Mon 6/27/22	44		100%
47	Jacobs provides to ICF Bypass and Side-Channel Inundated Habitat area analysis (suitable floodplain habitat)	5.2 wks	Fri 5/20/22	Fri 6/24/22	44		100%
48	Jacobs provides to ICF SALMOD	5.4 wks	Fri 5/20/22	Mon 6/27/22	44		100%
49	Jacobs provides to ICF DSM2	2 wks	Tue 5/24/22	Mon 6/6/22	44		100%
50	Jacobs provides to ICF OBAN (QEDA)	4 wks	Mon 6/13/22	Fri 7/8/22	44		0%
51	Jacobs provides to ICF IOS and DPM (Cramer)	4 wks	Fri 5/27/22	Thu 6/23/22	44		100%

Sites\_ICF\_InternalSchedule\_07262022

ID	Task Name	Duration	Start	Finish	Predecessors	Workday Countdown	% Complete
52	Jacobs provides to ICF Reclamation Temp Model & HEC5Q for Sacramento River	2 wks	Mon 5/23/22	Sun 6/5/22	44		100%
53	Jacobs provides to ICF Reservoir Water Quality/Temp	4 wks	Fri 6/3/22	Thu 6/30/22	44		100%
54	Jacobs provides to ICF Power (LTGen, SWP_Power, & Sites_Power)	3 wks	Mon 5/23/22	Fri 6/10/22	44		100%
55	Jacobs provides to ICF CalSim II (2035CT & WSIP 2070)	3 wks	Tue 6/7/22	Mon 6/27/22	44		100%
56	ICF produces Salvage Density using CalSim output	3 wks	Fri 5/20/22	Thu 6/9/22	44		0%
57	Jacobs provides to ICF Daily Divertible and Storable Flow To	0 wks	Thu 6/2/22	Thu 6/2/22	44		100%
58	ICF produces Weighted Usable Area using CalSim output	3 wks	Fri 5/20/22	Thu 6/9/22	44		0%
59	Jacobs provides Climate Change modeling output	10 days	Tue 6/28/22	Mon 7/11/22	55		100%
60	Jacobs provides Socioeconomic Sensitivity Results in an Appen	35 days	Fri 5/20/22	Thu 7/7/22	44		0%
61	Analyze new modeling output	15 days	Mon 7/11/22	Fri 7/29/22	50	4	0%
62	Integration and Reclamation Draft Appendix 4C - Reclamation Responses to 2017 Draft EIS Comments	60 days	Mon 8/1/22	Fri 10/21/22		64	0%
63	ICF review and potentially qualitatively update 14 chapters Chps 7 Fluvial Geo, 8 GW; 9 VegWetlands; 10 Wildlife; 11 Aquatic Bio; 12 Geo; 13 Minerals; 14 LU; 15 Ag; 19 Noise; 22 CR; 24 Visual; 27 Pub Health; 30 EJ	60 days	Tue 2/8/22	Mon 5/2/22	14		100%
64	Jacobs provides Alt 2 modeling output	8 wks	Mon 7/11/22	Fri 9/2/22		29	0%
65	ICF review 17 chapters and potentially quantitatively update impact analysis in those 17 chapters and supporting appendices	40 days	Mon 9/5/22	Fri 10/28/22	58,64	69	0%
66	Jacobs updates applicable appendices with new modeling data	20 days	Tue 7/12/22	Mon 8/8/22	59	10	0%
67	Prepare Draft MMRP (Assumes no change to any mitigation as a result of chapter updates (tasks 37/38))	35 days	Wed 10/5/22	Tue 11/22/22	337	86	0%
68	Authority/Reclamation/Attorney review of the Draft MMRP	15 days	Wed 11/23/22	Tue 12/13/22	67	101	0%
69	ICF finalize MMRP	15 days	Wed 12/14/22	Tue 1/3/23	68	116	0%
70	Compile tracked changes of Volumes 1 & 2 to address project description changes, new modeling analysis (inc Alt 2) and RTC	20 days	Mon 10/31/22	Fri 11/25/22	63,65	89	0%
71	<b>Admin Final EIR/EIS &amp; Public Final EIR/EIS</b>	<b>383 days</b>	<b>Mon 1/3/22</b>	<b>Wed 6/21/23</b>			<b>0%</b>
72	Reclamation BDO staff/Cooperating Agencies/Authority/Legal review Volumes 1 & 2 tracked changes	20 days	Mon 11/28/22	Fri 12/23/22	70	109	0%
73	Integration reconciles conflicting comments, provide direction on priority comments	5 days	Mon 12/26/22	Fri 12/30/22	72	114	0%

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ID	Task Name	Duration	Start	Finish	Predecessors	Workday Countdown	% Complete
74	ICF revises Vol 1, 2 & 3 (updated to address reviewers comments using comment bubbles or highlights to	35 days	Mon 1/2/23	Fri 2/17/23	73,41	149	0%
75	Reclamation drafts ROD	20 days	Mon 2/20/23	Fri 3/17/23	74	169	0%
76	ICF compiles Vol 1, 2 & 3 (prepare doc w/vertical lines) for Screencheck review	15 days	Mon 2/27/23	Fri 3/17/23	74FS+5 days,62	169	0%
77	Reclamation SES and Solicitor Review	2 wks	Mon 3/20/23	Fri 3/31/23	76	179	0%
78	Authority Concurrent Review	2 wks	Mon 3/20/23	Fri 3/31/23	76	179	0%
79	ICF backchecks comments received ("Final Document")	5 days	Mon 4/3/23	Fri 4/7/23	77,78	184	0%
80	ICF's ADA compliance for "Final Document" (Assumes 1,900 pgs Vol 1; 7,000 pgs Vol 2; 2,000 pgs Vol 3)	15 days	Mon 4/10/23	Fri 4/28/23	79	199	0%
81	<b>NEPA Signatory Process</b>	<b>38 days</b>	<b>Mon 5/1/23</b>	<b>Wed 6/21/23</b>			<b>0%</b>
82	Reclamation reviews ADA/508 Compliant Document	5 days	Mon 5/1/23	Fri 5/5/23	80	204	0%
83	Reclamation's NEPA Review Team in DC reviews ADA compliant document	2 wks	Mon 5/8/23	Fri 5/19/23	82	214	0%
84	Reclamation sends Final EIS for clearance from HQ/DOI	3 days	Mon 5/22/23	Wed 5/24/23	83	217	0%
85	Reclamation/Department of Interior Request Final EIS Briefi	3 wks	Thu 5/25/23	Wed 6/14/23	84	232	0%
86	Reclamation sends ROD for clearance from HQ/DOI (Date is dependent/predecessors on the finalization of the BiOp	3 days	Thu 5/25/23	Mon 5/29/23	84,109,162	220	0%
87	Reclamation/Department of Interior Request ROD Briefing	3 wks	Tue 5/30/23	Mon 6/19/23	86	235	0%
88	Reclamation Sign NEPA ROD	1 day	Tue 6/20/23	Tue 6/20/23	87	236	0%
89	NEPA Publication	1 day	Wed 6/21/23	Wed 6/21/23	88	237	0%
90	<b>CEQA Signatory Process</b>	<b>379 days</b>	<b>Mon 1/3/22</b>	<b>Thu 6/15/23</b>			<b>0%</b>
91	Authority/Legal Draft Findings and Statement of Overriding Considerations	20 days	Mon 4/10/23	Fri 5/5/23	79	204	0%
92	ICF reviews Findings and Statement of Overriding Considera	5 days	Mon 5/8/23	Fri 5/12/23	91	209	0%
93	PLACEHOLDER: Authority Technical Staff review and approv	2 wks	Mon 1/3/22	Fri 1/14/22			0%
94	PLACEHOLDER: Authority adds to Board Agenda	4 wks	Mon 1/17/22	Fri 2/11/22	93		0%
95	PLACEHOLDER: Board Approved and Signed	1 wk	Mon 2/14/22	Fri 2/18/22	94		0%
96	PLACEHOLDER: Sending to State Clearing House	1 wk	Mon 2/21/22	Fri 2/25/22	95		0%
97	CEQA Publication	1 day	Thu 6/15/23	Thu 6/15/23	92,80,85,9	233	0%
98	<b>Permits and Agreements</b>	<b>1839 days</b>	<b>Fri 9/17/21</b>	<b>Wed 10/4/28</b>			<b>13%</b>
99	<b>National Historic Preservation Act Consultation</b>	<b>378 days</b>	<b>Mon 1/3/22</b>	<b>Wed 6/14/23</b>			<b>18%</b>
100	<b>Prepare Programmatic Agreement</b>	<b>305 days</b>	<b>Mon 1/3/22</b>	<b>Fri 3/3/23</b>		<b>305</b>	<b>10%</b>

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ID	Task Name	Duration	Start	Finish	Predecessors	Workday Countdown	% Complete
101	Authority and Integration comple review of Draft PA	0 days	Mon 1/3/22	Mon 1/3/22			100%
102	Reclamation to circulate Draft PA to SHPO, Tribes and consulting parties	29 days	Tue 1/25/22	Fri 3/4/22			100%
103	Receive comments from SHPO, consulting parties and Tribes on Revised Draft PA	6 mons	Mon 3/7/22	Fri 8/19/22	102	19	0%
104	Prepare Draft Final PA for Reclamation review	8 wks	Mon 8/22/22	Fri 10/14/22	103	59	0%
105	Reclamation Review of Draft Final PA	1 mon	Mon 10/17/22	Fri 11/11/22	104	79	0%
106	Integrate comments and prepare Final PA	8 wks	Mon 11/14/22	Fri 1/6/23	105	119	0%
107	Consult with SHPO and consulting parties on Final PA	4 wks	Mon 1/9/23	Fri 2/3/23	106	139	0%
108	Circulate Final PA to SHPO and consulting parties for signature	1 mon	Mon 2/6/23	Fri 3/3/23	107	159	0%
109	Final PA executed by Reclamation (Needed for the ROD)	0 days	Mon 1/3/22	Mon 1/3/22			0%
110	<b>Programmatic Historic Properties Management Plan</b>	<b>347 days</b>	<b>Tue 2/15/22</b>	<b>Wed 6/14/23</b>			<b>32%</b>
111	Submit draft Preliminary Draft PHPMP to Integration	112 days	Tue 2/15/22	Wed 7/20/22			100%
112	Integration review of Preliminary Draft PHPMP	1 mon	Thu 7/21/22	Wed 8/17/22	111	17	0%
113	Integrate comments and prepare Draft PHPMP for Reclamation review	12 wks	Thu 8/18/22	Wed 11/9/22	112	77	0%
114	Reclamation Review of Draft PHPMP	1 mon	Thu 11/10/22	Wed 12/7/22	113	97	0%
115	Integrate comments and prepare Draft Final PHPMP for SHPO and consulting parties review	12 wks	Thu 12/8/22	Wed 3/1/23	114	157	0%
116	SHPO and consulting parties review	1 mon	Thu 3/2/23	Wed 3/29/23	115	177	0%
117	Integrate comments and prepare Final PHPMP for Integration, Authority, and Reclamation review	10 wks	Thu 3/30/23	Wed 6/7/23	116	227	0%
118	Circulate Final PHPMP to SHPO and consulting parties	1 wk	Thu 6/8/23	Wed 6/14/23	117	232	0%
119	<b>Implementation of Cultural Compliance</b>	<b>155 days</b>	<b>Mon 6/20/22</b>	<b>Fri 1/20/23</b>			<b>0%</b>
126	<b>Revised draft Biological Assessment</b>	<b>313 days</b>	<b>Tue 1/25/22</b>	<b>Thu 4/6/23</b>			<b>32%</b>
127	<b>Receive new operations modeling output</b>	<b>98 days</b>	<b>Tue 1/25/22</b>	<b>Thu 6/9/22</b>			<b>100%</b>
128	Jacobs begins new Alt 3 modeling runs	0 days	Tue 1/25/22	Tue 1/25/22			100%
129	Jacobs provides ICF CalSim Modeling	8 wks	Mon 2/28/22	Fri 4/22/22			100%
130	Jacobs provides ICF USRDOM Upper Sac daily flow data	0.6 wks	Mon 4/25/22	Wed 4/27/22	129		100%
131	Jacobs provides ICF Anderson-Martin Egg Mortality	2 wks	Mon 4/25/22	Fri 5/6/22	129		100%
132	Jacobs provides ICF SALMOD	2 wks	Mon 4/25/22	Fri 5/6/22	129		100%
133	Jacobs provides ICF Bypass and Side-Channel Inundated Habitat area analysis	3 wks	Fri 4/29/22	Thu 5/19/22	129		100%

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ID	Task Name	Duration	Start	Finish	Predecessors	Workday Countdown	% Complete
134	Jacobs provides ICF DSM2 (Hydro & Qual)	1 wk	Wed 4/27/22	Tue 5/3/22	129		100%
135	Jacobs provides ICF IOS & DPM (Cramer)	4 wks	Mon 4/25/22	Fri 5/20/22	129		100%
136	Jacobs provides ICF OBAN (QEDA)	3 wks	Mon 5/9/22	Fri 5/27/22	129		100%
137	Jacobs provides ICF Reservoir Temperature	3 wks	Tue 5/3/22	Mon 5/23/22	129		100%
138	Jacobs provides ICF Reclamation Temp Model & HEC5Q for Sacramento River	1 wk	Thu 4/28/22	Wed 5/4/22	129		100%
139	ICF produces Salvage Density using CalSim output	3 wks	Fri 5/20/22	Thu 6/9/22	133		100%
140	ICF produces Daily Divertible and Storable Flow Tool	3 wks	Fri 5/20/22	Thu 6/9/22	133		100%
141	ICF produces Weighted Usable Area using CalSim output	3 wks	Fri 5/20/22	Thu 6/9/22	133		100%
142	Analyze new modeling output	0 days	Thu 6/9/22	Thu 6/9/22	141		100%
143	Revise chapters with new analysis (Assumes revisions and discussion of early analysis with Integration/Authority/Jacobs)	5 days	Fri 6/10/22	Thu 6/16/22	142		100%
144	Jacobs updates appendices with new modeling results	4 wks	Mon 5/30/22	Fri 6/24/22	137		100%
145	Update Terrestrial Sections with programmatic approach, Alt 3, new project description, updated impact acreages	24 days	Tue 1/25/22	Fri 2/25/22			100%
146	Submit Terrestrial Sections to Integration for Review	5 days	Mon 2/28/22	Fri 3/4/22	145		100%
147	Receive Terrestrial Sections comments from Integration Team	0 days	Fri 3/4/22	Fri 3/4/22	146		100%
148	Integrate comments on Terrestrial Sections and submit to Reclamation for review	5 days	Mon 3/7/22	Fri 3/11/22	147		100%
149	Revise mitigation and adaptive management plan	1 day	Fri 6/17/22	Fri 6/17/22	143		100%
150	QA/QC and editing of entire BA	1 day	Fri 6/17/22	Fri 6/17/22	143		100%
151	Submit BA to Reclamation, legal, Integration and Authority	0 days	Fri 6/17/22	Fri 6/17/22	150		100%
152	Reclamation, legal team, Integration, MWD and Authority review	30 days	Mon 6/20/22	Fri 7/29/22	151	4	0%
153	Integration consolidate comments and submit to ICF	2 days	Mon 8/1/22	Tue 8/2/22	152	6	0%
154	Update BA to address comments and integrate Jacobs appendices to submit to Integration	20 days	Wed 8/3/22	Tue 8/30/22	153	26	0%
155	Workshop with Reclamation, NMFS, USFWS (and CDFW?)	5 days	Wed 8/31/22	Tue 9/6/22	154	31	0%
156	Coordinate with Reclamation on edits requested during workshop	5 days	Wed 9/7/22	Tue 9/13/22	155	36	0%
157	Finalize draft BA	10 days	Wed 9/14/22	Tue 9/27/22	156	46	0%
158	Integration & Authority review final draft	10 days	Wed 9/28/22	Tue 10/11/22	157	56	0%
159	Integration submits BA to Reclamation	5 days	Wed 10/12/22	Tue 10/18/22	158	61	0%
160	Reclamation initiate consultation with FWS and NMFS	10 days	Wed 10/19/22	Tue 11/1/22	159	71	0%

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ID	Task Name	Duration	Start	Finish	Predecessors	Workday Countdown	% Complete
161	Receive Draft Biological Opinion (BO) from FWS and NMFS (135 days for formal consultation following initiation and submittal of BA as long as package is complete)	135 edays	Tue 11/1/22	Thu 3/16/23	160	168	0%
162	Receive Final BO from FWS and NMFS (Needed for ROD)	15 days	Fri 3/17/23	Thu 4/6/23	161	183	0%
163	<b>CDFW CESA Operations ITP</b>	<b>279 days</b>	<b>Fri 6/10/22</b>	<b>Wed 7/5/23</b>			<b>0%</b>
164	Analyze new modeling output for CESA species	28 days	Fri 6/10/22	Tue 7/19/22	142		0%
165	Update 2021 draft with PD changes, new analysis, mitigation, and comments received on draft BA	20 days	Wed 8/3/22	Tue 8/30/22	164,153	26	0%
166	Post Updated draft ITP for Integration, Authority and legal review	1 day	Wed 8/31/22	Wed 8/31/22	165	27	0%
167	Integration, Authority and legal review draft ITP	10 days	Thu 9/1/22	Wed 9/14/22	166	37	0%
168	Integration provides comments	1 day	Thu 9/15/22	Thu 9/15/22	167	38	0%
169	Schedule workshop with CDFW to discuss key topics of the application package	5 days	Wed 8/31/22	Tue 9/6/22	165	31	0%
170	Coordinate with Integration, Authority and legal on edits requested during workshop	5 days	Wed 9/7/22	Tue 9/13/22	169	36	0%
171	Integrate comments into draft ITP, finalize figures, tables, appendices	10 days	Wed 9/14/22	Tue 9/27/22	170	46	0%
172	Integration, Authority, legal review of draft ITP application package	10 days	Wed 9/28/22	Tue 10/11/22	331FF,171	56	0%
173	Integration consolidates comments and submit to ICF	2 days	Wed 10/12/22	Thu 10/13/22	172	58	0%
174	Integrate comments and finalize application package	10 days	Fri 10/14/22	Thu 10/27/22	173	68	0%
175	Post ITP application package for the Authority to finalize, sign, and submit with application fee	5 days	Fri 10/28/22	Thu 11/3/22	174	73	0%
176	Authority submits ITP application package to CDFW	1 day	Fri 11/4/22	Fri 11/4/22	175	74	0%
177	Authority receives complete/incomplete letter	30 edays	Fri 11/4/22	Sun 12/4/22	176	94	0%
178	Receive Draft ITP from CDFW	120 edays	Sun 12/4/22	Mon 4/3/23	177	180	0%
179	Receive Final ITP from CDFW (Requires FEIR NOD)	20 edays	Thu 6/15/23	Wed 7/5/23	178,97	247	0%
180	<b>CDFW CESA Construction ITP</b>	<b>377 days</b>	<b>Wed 1/19/22</b>	<b>Thu 6/29/23</b>			<b>0%</b>
181	Submit finalized application packet to CDFW	0 days	Wed 1/19/22	Wed 1/19/22			100%
182	Receive Incomplete Letter from CDFW	0 days	Mon 4/18/22	Mon 4/18/22	181		0%
183	Integration provide phasing of construction and funding	0 days	Fri 8/19/22	Fri 8/19/22		18	0%
184	Update sections with additional information requested from CDFW (includes rerunning all impact acreages)	20 days	Fri 8/19/22	Thu 9/15/22	182,183	38	0%
185	Submit to Integration and the Authority for review	1 day	Fri 9/16/22	Fri 9/16/22	184	39	0%

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ID	Task Name	Duration	Start	Finish	Predecessors	Workday Countdown	% Complete
186	Integration, Authority, Legal, GCID and TCCA review	10 days	Mon 9/19/22	Fri 9/30/22	185	49	0%
187	ICF integrates comments for revised Final ITP application package	10 days	Mon 10/3/22	Fri 10/14/22	186	59	0%
188	Authority resubmits ITP application package to CDFW	5 days	Mon 10/17/22	Fri 10/21/22	187	64	0%
189	Receive Draft ITP from CDFW	90 days	Mon 10/24/22	Fri 2/24/23	188	154	0%
190	Integration/Authority/ICF/Legal reviews draft and makes recommendations for edits/changes	15 days	Mon 2/27/23	Fri 3/17/23	189	169	0%
191	Receive Final ITP from CDFW (Requires FEIR NOD)	10 days	Fri 6/16/23	Thu 6/29/23	190,97	243	0%
192	<b>CDFW Master Lake and Streambed Alteration Agreement</b>	<b>309 days</b>	<b>Mon 5/2/22</b>	<b>Thu 7/6/23</b>			<b>7%</b>
193	Identify and map jurisdictional Lakes and Streams with GIS	10 days	Mon 5/2/22	Fri 5/13/22			100%
194	Identify MSA authorized activities per CDFW definition	10 days	Mon 5/16/22	Fri 5/27/22	193		100%
195	Assess project impacts to lake and stream zone resources per project and overall	15 days	Mon 5/30/22	Fri 6/17/22	194		100%
196	Develop MSA Notification package	36 days	Mon 6/20/22	Mon 8/8/22	195	10	0%
197	Submit early draft MSA Notification package to Integration for review	1 day	Tue 8/9/22	Tue 8/9/22	196	11	0%
198	Integration reviews draft application package	20 days	Wed 8/10/22	Tue 9/6/22	197	31	0%
199	Integrate comments into early draft application package	18 days	Wed 9/7/22	Fri 9/30/22	198	49	0%
200	Live edit meeting to finalize early draft application package	5 days	Mon 10/3/22	Fri 10/7/22	199	54	0%
201	Post draft application package for final review	1 day	Mon 10/10/22	Mon 10/10/22	200	55	0%
202	Authority/Integration/Legal review draft application package	20 days	Tue 10/11/22	Mon 11/7/22	201	75	0%
203	Integrate comments into draft application package	10 days	Tue 11/8/22	Mon 11/21/22	202	85	0%
204	GCID/TCCA Review draft application package	10 days	Tue 11/22/22	Mon 12/5/22	203	95	0%
205	Address comments received and upload into EPIMS permit portal	10 days	Tue 12/6/22	Mon 12/19/22	204	105	0%
206	Submit LSA Notification package to CDFW (Will need to include application fee)	1 day	Tue 12/20/22	Tue 12/20/22	205	106	0%
207	CDFW 30-day review of notification package for completeness	30 edays	Tue 12/20/22	Thu 1/19/23	206	128	0%
208	Address comments from CDFW	25 days	Fri 1/20/23	Thu 2/23/23	207	153	0%
209	CDFW 60 day review of complete notification package	60 edays	Thu 2/23/23	Mon 4/24/23	208	195	0%
210	CDFW issues draft LSA Agreement	5 days	Tue 4/25/23	Mon 5/1/23	209	200	0%
211	Review and revisions to draft LSA Agreement	18 days	Tue 5/2/23	Thu 5/25/23	210	218	0%
212	CDFW revises and issues final LSA Agreement (Requires FEIR NOD)	15 days	Fri 6/16/23	Thu 7/6/23	211,97	248	0%
213	<b>SWB Section 401 Water Quality</b>	<b>570 days</b>	<b>Fri 9/17/21</b>	<b>Thu 11/23/23</b>			<b>47%</b>

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ID	Task Name	Duration	Start	Finish	Predecessors	Workday Countdown	% Complete
214	Submit early draft 401 permit application to Integration/Authority for review	0 days	Fri 9/17/21	Fri 9/17/21			100%
215	Receive comments from Integration/Authority	13 days	Fri 9/17/21	Tue 10/5/21	214		100%
216	Integrate comments into early draft application package	85 days	Wed 10/6/21	Tue 2/1/22	215		100%
217	Live edit meeting with Integration to finalize early draft application package	1 day	Wed 2/2/22	Wed 2/2/22	216		100%
218	Integrate comments to prepare draft application package	10 days	Thu 2/3/22	Wed 2/16/22	217		100%
219	Submit draft application package to TCCA & GCID	10 days	Thu 2/17/22	Wed 3/2/22	218		100%
220	Receive comments and integrate into the draft application package	43 days	Thu 3/3/22	Mon 5/2/22	219		100%
221	Final review by Integration/Authority/Legal of draft application package	5 days	Tue 5/3/22	Mon 5/9/22	220		100%
222	Finalize and post early draft application package for Integration to submit to SWB	10 days	Fri 6/3/22	Thu 6/16/22	221,270		100%
223	Receive comments from SWB	46 days	Fri 6/17/22	Fri 8/19/22	222	19	0%
224	Address comments received to finalize draft application package	35 days	Mon 8/22/22	Fri 10/7/22	223	54	0%
225	Receive signed forms and assemble application package	5 days	Mon 10/10/22	Fri 10/14/22	224	59	0%
226	Post revised application package for Integration to submit to SWB	1 day	Mon 10/17/22	Mon 10/17/22	225	60	0%
227	SWB issues draft 401 WQC	90 days	Fri 6/16/23	Thu 10/19/23	226,282,97323		0%
228	Integration/Authority/ICF/Legal/TCCA & GCID reviews draft and makes recommendations for edits/changes	20 days	Fri 10/20/23	Thu 11/16/23	227	343	0%
229	SWB issues Final 401 WQC (After completion of the FEIR, NOD and MMRP and 408; will need for Water Rights)	5 days	Fri 11/17/23	Thu 11/23/23	228,69,97,348		0%
230	<b>Section 404/10 Permit</b>	<b>653 days</b>	<b>Mon 10/18/21</b>	<b>Thu 4/18/24</b>			<b>45%</b>
231	Submit early draft 404 permit application packet to Integration and Reclamation for review	0 days	Tue 10/26/21	Tue 10/26/21			100%
232	Receive comments from Integration and Reclamation	29 days	Tue 10/26/21	Fri 12/3/21	231		100%
233	Integrate comments and finalize early draft application package	54 days	Mon 12/6/21	Thu 2/17/22	232		100%
234	Live edit meeting to finalize early draft application package	1 day	Fri 2/18/22	Fri 2/18/22	233		100%
235	Integrate comments to prepare draft application package (assumes that the 404 will be sent for review prior to receiving 401 comments due on 3/23 and that they won't be integrated into the 404 until the next deliverable on 5/6)	10 days	Mon 2/21/22	Fri 3/4/22	234		100%
236	GCID/TCCA review of draft application package	10 days	Mon 3/7/22	Fri 3/18/22	235		100%
237	Legal/Authority/Integration review of draft application package	33 days	Mon 3/21/22	Wed 5/4/22	236		100%

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ID	Task Name	Duration	Start	Finish	Predecessors	Workday Countdown	% Complete
238	Finalize and post early draft application package for Integration to submit to USACE	31 days	Thu 5/5/22	Thu 6/16/22	237,270		97%
239	Receive comments from USACE (i.e. compensatory mitigation plan requirements, design drwgs, Dam Safety conditions)	35 days	Fri 6/17/22	Thu 8/4/22	238	8	0%
240	Address comments received to finalize draft application package (this task assumes multiple rounds of edits/review with USACE)	3 mons	Fri 8/5/22	Thu 10/27/22	239	68	0%
241	Receive signed forms and assemble application package	5 days	Fri 10/28/22	Thu 11/3/22	240	73	0%
242	Integration submit final application package to USACE (will need to demonstrate compliance with established State Dam Safety Standards- requires input from engineers)	1 day	Fri 11/4/22	Fri 11/4/22	241	74	0%
243	Prepare Draft Public Notice for USACE as requested	8 days	Mon 11/7/22	Wed 11/16/22	242	82	0%
244	USACE Completeness review 15d; Public Notice 15d, could be extended) (Assumes minimal comments and no public hearing)	90 days	Mon 11/7/22	Fri 3/10/23	242	164	0%
245	Receive public comments from USACE and provide technical assistance. Duration assumes minimal comments.	15 days	Mon 3/13/23	Fri 3/31/23	244	179	0%
246	Receive draft permit conditions from USACE for review before permit is issued	1 mon	Mon 4/3/23	Fri 4/28/23	245	199	0%
247	Integration/Authority/ICF/Legal/TCCA & GCID reviews draft and makes recommendations for edits/changes	1 mon	Mon 5/1/23	Fri 5/26/23	246	219	0%
248	USACE issues final 404 (Relies on completion of USC 408, 401/WDR, PJD, ROD, Section 7 and Section 106)	10 days	Fri 4/5/24	Thu 4/18/24	282,229,10453		0%
249	<b>404(b)(1) Memorandum</b>	<b>351 days</b>	<b>Mon 10/18/21</b>	<b>Tue 2/21/23</b>			<b>52%</b>
250	Receive comments from Integration and Reclamation on early draft memo	0 days	Mon 10/18/21	Mon 10/18/21			100%
251	Integrate comments and facilitate working sessions to review	109 days	Tue 10/19/21	Fri 3/18/22	250		100%
252	Live edit meeting to finalize	1 day	Mon 3/21/22	Mon 3/21/22	251		100%
253	ICF (and Integration) integrate comments and finalize draft memo	24 days	Tue 3/22/22	Fri 4/22/22	252		100%
254	Legal/Authority/Reclamation review memo	22 days	Mon 4/25/22	Tue 5/24/22	253		100%
255	ICF submits revised overall project purpose & data needs to Integration/Authority	27 days	Wed 5/25/22	Thu 6/30/22	254		100%
256	Integration/Authority addresses data needs & revisions to project purpose	22 days	Fri 7/1/22	Mon 8/1/22	255	5	0%
257	Address Legal/Authority/Reclamation comments	22 days	Tue 8/2/22	Wed 8/31/22	256	27	0%
258	Legal/Authority/Reclamation review memo	11 days	Thu 9/1/22	Thu 9/15/22	257	38	0%

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ID	Task Name	Duration	Start	Finish	Predecessors	Workday Countdown	% Complete
259	Address Legal/Authority/Reclamation comments	11 days	Fri 9/16/22	Fri 9/30/22	258	49	0%
260	Post draft memo for Integration to submit to USACE	1 day	Mon 10/3/22	Mon 10/3/22	259	50	0%
261	Receive comments from USACE/SWB	20 days	Tue 10/4/22	Mon 10/31/22	260	70	0%
262	Address comments received to finalize Memo package	20 days	Tue 11/1/22	Mon 11/28/22	261	90	0%
263	Assemble Memo package	5 days	Tue 11/29/22	Mon 12/5/22	262	95	0%
264	Post Memo package for Integration to submit to USACE/SWB	1 day	Tue 12/6/22	Tue 12/6/22	263,242	96	0%
265	Receive comments from USACE/SWB	20 days	Wed 12/7/22	Tue 1/3/23	264	116	0%
266	Address comments from USACE/SWB	24 days	Wed 1/4/23	Mon 2/6/23	265	140	0%
267	Authority/Integration reviews Final Memo package	10 days	Tue 2/7/23	Mon 2/20/23	266	150	0%
268	Post Final Memo package for Integration to submit to USACE/SWB	1 day	Tue 2/21/23	Tue 2/21/23	267	151	0%
269	<b>Aquatic Resources Delineation Surveys</b>	<b>242 days</b>	<b>Fri 3/25/22</b>	<b>Mon 2/27/23</b>			<b>25%</b>
270	Submit early draft Aquatic Resources Delineation Report (ARDR) based on desktop analysis to Integration for review	0 days	Fri 3/25/22	Fri 3/25/22			100%
271	Integration review draft ARDR	23 days	Fri 3/25/22	Tue 4/26/22	270		100%
272	Integrate comments from Integration to submit to Reclamation/Authority/GCID/TCCA/Legal	11 days	Wed 4/27/22	Wed 5/11/22	271		100%
273	Reclamation/Authority/GCID/TCCA/Legal review draft ARDR	40 days	Thu 5/12/22	Wed 7/6/22	272		100%
274	Integrate comments and facilitate working session to review updates and finalize	15 days	Mon 6/27/22	Fri 7/15/22	273		60%
275	Post ARDR report for Integration to submit to USACE	1 day	Mon 7/18/22	Mon 7/18/22	274		0%
276	Field verification of specific aquatic resources with USACE (USACE has committed to 5 days in the field and have said this is required to issue PJD)	5 days	Mon 10/17/22	Fri 10/21/22		64	0%
277	Update mapping according to USACE comments	10 days	Mon 10/24/22	Fri 11/4/22	276	74	0%
278	Finalize Draft ARDR	15 days	Mon 11/7/22	Fri 11/25/22	277	89	0%
279	Post Draft ARDR for Integration review	10 days	Mon 11/28/22	Fri 12/9/22	278	99	0%
280	Integrate comments and submit Final ARDR to USACE	10 days	Mon 12/12/22	Fri 12/23/22	279	109	0%
281	Request PJD Verification letter from USACE	0 days	Fri 12/23/22	Fri 12/23/22	280	109	0%
282	Receive PJD Verification letter from USACE (USACE review period is 60 calendar days)	66 edays	Fri 12/23/22	Mon 2/27/23	281	155	0%
283	<b>Encroachment Permit/Section 408 Permission</b>	<b>568 days</b>	<b>Tue 2/1/22</b>	<b>Thu 4/4/24</b>			<b>4%</b>

Sites\_ICF\_InternalSchedule\_07262022

ID	Task Name	Duration	Start	Finish	Predecessors	Workday Countdown	% Complete
284	Identify and map designated floodways and regulated streams with GIS staff	20 days	Tue 2/1/22	Mon 2/28/22			90%
285	Identify Project activities within CVFPB jurisdiction	8 mons	Tue 3/1/22	Mon 10/10/22	284	55	11%
286	Assess project impacts to lake and stream zone resources per project and overall	20 days	Wed 11/2/22	Tue 11/29/22	285,287	91	0%
287	Receive design drawings from engineer team needed for the permit application	1 day	Tue 11/1/22	Tue 11/1/22		71	0%
288	Develop early draft Encroachment Permit Application (Joint effort with engineer design team)	3 mons	Wed 11/2/22	Tue 1/24/23	287	131	0%
289	Submit early draft Encroachment Permit Application to Integration for review	1 day	Wed 1/25/23	Wed 1/25/23	288	132	0%
290	Receive comments from Integration	20 days	Thu 1/26/23	Wed 2/22/23	289	152	0%
291	Integrate comments into early draft application package	20 days	Thu 2/23/23	Wed 3/22/23	290	172	0%
292	Live edit meeting to finalize early draft application package	1 day	Tue 11/1/22	Tue 11/1/22		71	0%
293	Post early draft application package for final review	1 day	Thu 3/23/23	Thu 3/23/23	291	173	0%
294	Receive comments from Integration	15 days	Fri 3/24/23	Thu 4/13/23	293	188	0%
295	Address comments received and submit Encroachment Permit Application package to Local Maintaining Agencies	25 days	Fri 4/14/23	Thu 5/18/23	294	213	0%
296	Submit Encroachment Permit Application package to Flood Board	10 days	Fri 5/19/23	Thu 6/1/23	295	223	0%
297	Flood Board 30 day review of notification package for completeness	30 edays	Thu 6/1/23	Sat 7/1/23	296	244	0%
298	Address comments from Flood Board	25 days	Mon 7/3/23	Fri 8/4/23	297	269	0%
299	Flood Board 30 day review of complete application package	30 edays	Fri 8/4/23	Sun 9/3/23	298	289	0%
300	Flood Board 408 Request to USACE	10 days	Mon 9/4/23	Fri 9/15/23	299	299	0%
301	USACE 408 Review (90d once NEPA and Sections 7 and 106 are complete)	90 edays	Fri 9/15/23	Thu 12/14/23	300	363	0%
302	Flood Board Meeting and approval of encroachment Permit (<180d after CEQA and 408 are complete)	4 mons	Fri 12/15/23	Thu 4/4/24	301	443	0%
303	<b>Eagle Permits and Surveys</b>	<b>150 days</b>	<b>Fri 1/21/22</b>	<b>Thu 8/18/22</b>			<b>0%</b>
304	<b>Conduct helicopter surveys (3 separate surveys/months)</b>	<b>124 days</b>	<b>Fri 1/21/22</b>	<b>Wed 7/13/22</b>		<b>57</b>	<b>0%</b>
305	January Surveys	7 days	Fri 1/21/22	Mon 1/31/22			0%
306	April Surveys	9 days	Thu 4/7/22	Tue 4/19/22			0%
307	July Surveys	7 days	Tue 7/5/22	Wed 7/13/22			0%
308	Prepare survey report & submit to Integration for review	15 days	Thu 7/14/22	Wed 8/3/22	307	7	0%

Sites\_ICF\_InternalSchedule\_07262022

ID	Task Name	Duration	Start	Finish	Predecessors	Workday Countdown	% Complete
309	Incorporate comments for final report to be submitted to USFWS	10 days	Thu 8/4/22	Wed 8/17/22	308	17	0%
310	Submit to USFWS	1 day	Thu 8/18/22	Thu 8/18/22	309	18	0%
311	<b>Short-term Construction Permit</b>	<b>175 days</b>	<b>Mon 4/25/22</b>	<b>Fri 12/23/22</b>			<b>0%</b>
312	Submit draft application to Integration for review	28 days	Mon 4/25/22	Wed 6/1/22			0%
313	Integrate comments and submit final application for review	3 days	Wed 6/15/22	Fri 6/17/22			0%
314	Authority submit application to USFWS	15 days	Mon 6/20/22	Fri 7/8/22	313		0%
315	Receive permit from USFWS	6 mons	Mon 7/11/22	Fri 12/23/22	314	109	0%
316	<b>Long-term Construction Permit</b>	<b>1500 days</b>	<b>Thu 1/5/23</b>	<b>Wed 10/4/28</b>		1617	0%
317	<b>Invasive Species Management Plan</b>	<b>370 days</b>	<b>Thu 6/1/23</b>	<b>Wed 10/30/24</b>			<b>0%</b>
318	Identify invasive plant species and populations during special-status plant surveys	15 mons	Thu 6/1/23	Wed 7/24/24		522	0%
319	Develop Draft Invasive Plant Species Management Plan for Integration review	30 days	Thu 7/25/24	Wed 9/4/24	318	552	0%
320	Integration and Authority review and ICF corporate comments	20 days	Thu 9/5/24	Wed 10/2/24	319	572	0%
321	Develop Final Invasive Plant Species Management Plan	20 days	Thu 10/3/24	Wed 10/30/24	320	592	0%
322	<b>Assist with Preparation of Mitigation Banking Request for Proposed</b>	<b>77 days</b>	<b>Mon 8/1/22</b>	<b>Tue 11/15/22</b>			<b>0%</b>
323	Develop Draft Scope of Services	60 days	Mon 8/1/22	Fri 10/21/22		64	0%
324	Authority and Integration review draft	10 days	Mon 10/24/22	Fri 11/4/22	323	74	0%
325	Incorporate comments and prepare Revised Draft Scope of Services	5 days	Mon 11/7/22	Fri 11/11/22	324	79	0%
326	Post Final Draft to Sites SharePoint site	2 days	Mon 11/14/22	Tue 11/15/22	325	81	0%
327	<b>Revise Adaptive Management Plan and Mitigation Plan</b>	<b>347 days</b>	<b>Wed 12/29/21</b>	<b>Thu 4/27/23</b>			<b>0%</b>
328	<b>Update 2021 final draft AMP with changes</b>	<b>347 days</b>	<b>Wed 12/29/21</b>	<b>Thu 4/27/23</b>			<b>0%</b>
329	Authority and Integration review Revised Draft AMP	10 days	Wed 12/29/21	Tue 1/11/22			0%
330	Incorporate comments and prepare Revised Draft AMP	86 days	Fri 3/18/22	Fri 7/15/22	329		0%
331	Post Final Draft to Sites SharePoint site for submittal with Ops ITP application to CDFW	15 days	Mon 7/18/22	Fri 8/5/22	330	9	0%
332	Update AMP with comments received from agencies and final	30 days	Fri 3/17/23	Thu 4/27/23	161	198	0%
333	<b>Update 2021 final draft MMP with changes</b>	<b>258 days</b>	<b>Tue 5/3/22</b>	<b>Thu 4/27/23</b>			<b>0%</b>
334	Integration review Revised Draft MMP	40 days	Tue 5/3/22	Mon 6/27/22			0%
335	Incorporate comments and prepare Final Draft MMP	14 days	Tue 6/28/22	Fri 7/15/22	334		0%
336	Authority review Final Draft MMP and provide comments	10 days	Mon 7/18/22	Fri 7/29/22	335	4	0%

Sites\_ICF\_InternalSchedule\_07262022

ID	Task Name	Duration	Start	Finish	Predecessors	Workday Countdown	% Complete
337	Post Final Draft to Sites SharePoint site for submittal with Ops ITP application to CDFW	5 days	Wed 9/28/22	Tue 10/4/22	172SS,336	51	0%
338	Update MMP with comments received from agencies and fina	30 days	Fri 3/17/23	Thu 4/27/23	161	198	0%
339	<b>Biological Survey Plan</b>	<b>120 days</b>	<b>Wed 8/3/22</b>	<b>Tue 1/17/23</b>			<b>0%</b>
340	Develop Draft Biological Survey Plan for the Authority, Real Estate, and Integration	3 mons	Wed 8/3/22	Tue 10/25/22		66	0%
341	Incorporate comments to prepare final Draft Survey Plan for 2023/24 surveys	60 days	Wed 10/26/22	Tue 1/17/23	340	126	0%
342	<b>Stone Corral Creek and Funks Creek Flow Plan</b>	<b>386 days</b>	<b>Fri 4/1/22</b>	<b>Fri 9/22/23</b>			<b>0%</b>
343	Develop Draft Aquatic Study Plan	85 days	Mon 4/4/22	Fri 7/29/22		4	0%
344	Integration and the Authority review the Draft Aquatic Study Plan	20 days	Mon 8/1/22	Fri 8/26/22	343	24	0%
345	Incorporate comments and prepare Revised Draft Aquatic Study Plan	15 days	Mon 8/29/22	Fri 9/16/22	344	39	0%
346	Survey creeks to gather existing fish assemblage and identify habitat use data	30 days	Mon 6/5/23	Fri 7/14/23		254	0%
347	Record fish survey results on a Fish Survey Record data sheet	15 days	Mon 7/17/23	Fri 8/4/23	346	269	0%
348	Refine flow sampling protocol/work plan	30 days	Fri 4/1/22	Thu 5/12/22			0%
349	Develop Flow draft report	12 mons	Fri 5/13/22	Thu 4/13/23	348	188	0%
350	Refine fluvial geomorphology work plan	30 days	Thu 1/5/23	Wed 2/15/23		147	0%
351	Develop fluvial geomorphology report	60 days	Mon 6/5/23	Fri 8/25/23	350	284	0%
352	Refine Surface Water Ambient Monitoring work plan	30 days	Thu 1/5/23	Wed 2/15/23		147	0%
353	Develop Surface Water Ambient Monitoring final report	60 days	Mon 6/5/23	Fri 8/25/23		284	0%
354	Surface Water Ambient Monitoring lab data sheets	20 days	Mon 8/28/23	Fri 9/22/23	353	304	0%
355	Refine Hydrological Study work plan	30 days	Thu 1/5/23	Wed 2/15/23		147	0%
356	Develop Hydrological Study final report	60 days	Mon 6/5/23	Fri 8/25/23		284	0%
357	<b>Geotechnical Investigations</b>	<b>647 days</b>	<b>Thu 7/1/21</b>	<b>Fri 12/22/23</b>			<b>0%</b>

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**From:** Edwards, Dawn [Dawn.Edwards@hdrinc.com]  
**Sent:** 7/26/2022 5:59:36 PM  
**To:** Alicia Forsythe [aforsythe@sitesproject.org]; Arsenijevic, Jelica [jelica.arsenijevic@hdrinc.com]; Ruth, Monica [Monica.Ruth@hdrinc.com]  
**CC:** Kalaskar, Tanya [Tanya.Kalaskar@hdrinc.com]; Risse, Danielle [danielle.risse@hdrinc.com]; Spranza, John [john.spranza@hdrinc.com]; Laurie Warner Herson [laurie.warner.herson@phenixenv.com]; Lloyd, John [John.Lloyd@hdrinc.com]; Kevin Spesert [kspesert@sitesproject.org]  
**Subject:** RE: AB 52 Consultation - Test Pits/Trenching

Hi all –

I agree with adding the statement in #1 – and whatever the answer is for #3, I'll need any updates also for our project description.

In regards to #2, we doubled the times for all and added another 5 days just for the fault trenches on top of that in the IS PD – maybe make these letters the same?

Thanks,  
Dawn

Dawn Edwards  
M 360.460.9581

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**From:** Alicia Forsythe <aforsythe@sitesproject.org>  
**Sent:** Tuesday, July 26, 2022 5:33 PM  
**To:** Arsenijevic, Jelica <Jelica.Arsenijevic@hdrinc.com>; Ruth, Monica <Monica.Ruth@hdrinc.com>  
**Cc:** Kalaskar, Tanya <Tanya.Kalaskar@hdrinc.com>; Edwards, Dawn <Dawn.Edwards@hdrinc.com>; Risse, Danielle <danielle.risse@hdrinc.com>; Spranza, John <john.spranza@hdrinc.com>; Laurie Warner Herson <laurie.warner.herson@phenixenv.com>; Lloyd, John <John.Lloyd@hdrinc.com>; Kevin Spesert <kspesert@sitesproject.org>  
**Subject:** RE: AB 52 Consultation - Test Pits/Trenching

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Hi all – The letters look good to me. I had just a few little changes in them. Three questions –

1. I added this sentence into both: Impacts to known archeological and Tribal cultural resources will be avoided. I feel like we can do this and this is our intent. Are we comfortable with adding this?
2. The study durations seem super short to me – the number of days things would take. Should we add in a little buffer to these just in case?
3. Fault studies say that trenches may be up to 40 feet wide but that we would cover them daily with plywood. I've never seen a 40-foot wide sheet of plywood. 😊 Can we double check on this?

I realize that last 2 are items that may require coordination with the drilling team.

Ali

-----  
Alicia Forsythe | Environmental Planning and Permitting Manager | Sites Project Authority | 916.880.0676 |  
[aforsythe@sitesproject.org](mailto:aforsythe@sitesproject.org) | [www.SitesProject.org](http://www.SitesProject.org)

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**From:** Arsenijevic, Jelica <[Jelica.Arsenijevic@hdrinc.com](mailto:Jelica.Arsenijevic@hdrinc.com)>  
**Sent:** Tuesday, July 26, 2022 3:36 PM  
**To:** Ruth, Monica <[Monica.Ruth@hdrinc.com](mailto:Monica.Ruth@hdrinc.com)>; Alicia Forsythe <[aforsythe@sitesproject.org](mailto:aforsythe@sitesproject.org)>  
**Cc:** Kalaskar, Tanya <[Tanya.Kalaskar@hdrinc.com](mailto:Tanya.Kalaskar@hdrinc.com)>; Edwards, Dawn <[Dawn.Edwards@hdrinc.com](mailto:Dawn.Edwards@hdrinc.com)>; Risse, Danielle <[danielle.risse@hdrinc.com](mailto:danielle.risse@hdrinc.com)>; Spranza, John <[john.spranza@hdrinc.com](mailto:john.spranza@hdrinc.com)>; Laurie Warner Herson <[laurie.warner.herson@phenixenv.com](mailto:laurie.warner.herson@phenixenv.com)>; Lloyd, John <[John.Lloyd@hdrinc.com](mailto:John.Lloyd@hdrinc.com)>; Kevin Spesert <[kspesert@sitesproject.org](mailto:kspesert@sitesproject.org)>  
**Subject:** RE: AB 52 Consultation - Test Pits/Trenching

Hi there  
I think the letters look great!

Jelica Arsenijevic  
Environmental Project Manager

  
2379 Gateway Oaks Drive, Suite 200  
Sacramento, CA 95833  
D 916-679-8854  
M 209-329-6897

[Jelica.Arsenijevic@hdrinc.com](mailto:Jelica.Arsenijevic@hdrinc.com)

[hdrinc.com/follow-us](http://hdrinc.com/follow-us)

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**From:** Ruth, Monica <[Monica.Ruth@hdrinc.com](mailto:Monica.Ruth@hdrinc.com)>  
**Sent:** Wednesday, July 20, 2022 1:42 PM  
**To:** Alicia Forsythe <[aforsythe@sitesproject.org](mailto:aforsythe@sitesproject.org)>; Arsenijevic, Jelica <[jelica.arsenijevic@hdrinc.com](mailto:jelica.arsenijevic@hdrinc.com)>  
**Cc:** Kalaskar, Tanya <[Tanya.Kalaskar@hdrinc.com](mailto:Tanya.Kalaskar@hdrinc.com)>; Edwards, Dawn <[Dawn.Edwards@hdrinc.com](mailto:Dawn.Edwards@hdrinc.com)>; Risse, Danielle <[danielle.risse@hdrinc.com](mailto:danielle.risse@hdrinc.com)>; Spranza, John <[John.Spranza@hdrinc.com](mailto:John.Spranza@hdrinc.com)>; Laurie Warner Herson <[laurie.warner.herson@phenixenv.com](mailto:laurie.warner.herson@phenixenv.com)>; Lloyd, John <[John.Lloyd@hdrinc.com](mailto:John.Lloyd@hdrinc.com)>; Kevin Spesert <[kspesert@sitesproject.org](mailto:kspesert@sitesproject.org)>  
**Subject:** RE: AB 52 Consultation - Test Pits/Trenching

Hello, Ali and Jelica –

The draft courtesy notification and formal invitation letters are ready for your review (minus the figure attachment to be provided at a later date) here: [AB 52 Consultation](#)

As with the last round of letters, one letter is titled, “Sites\_AB 52\_DRAFT\_Formal Notification Letter” and is intended only for the Cachil Dehe Band of Wintun Indians (Colusa Indian Community Council) and the Yocha Dehe Wintun Nation. These two tribes have previously requested formal notification of the opportunity to consult, and are thus the intended recipients of the “formal” letter.

The other letter, titled, "Sites\_AB 52\_ DRAFT\_ **Courtesy** Notification Letter" is intended for the following Tribes which were identified by the Native American Heritage Commission (NAHC) in 2017 as potentially interested/affected Tribes that should be provided the opportunity to request consultation:

- Cortina Indian Rancheria of Wintun Indians
- Estom Yumeka Maidu Tribe of the Enterprise Rancheria
- Grindstone Indian Rancheria of Wintun-Wailaki
- Mechoopda Indian Tribe
- Paskenta Band of Nomlaki Indians

The letters include placeholders for each Tribe's contact information in red font. Once you are good with the template, these can be provided to Janis upon her return. After final reviews, we will finalize the names/contacts and make individually addressed letters accordingly and provide them for signature. Once they are signed, we will take care of production and distribution, including a follow-up phone call to each recipient to make sure the letters were received. We will save copies of final letters, distribution receipts, and notes on all calls made to the same SharePoint location for the project record.

Please let me know if you have any questions.

-monica

**Monica Ruth, M.A.**  
M 916-813-3060

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**From:** Alicia Forsythe <[aforsythe@sitesproject.org](mailto:aforsythe@sitesproject.org)>

**Sent:** Monday, July 11, 2022 4:28 PM

**To:** Risse, Danielle <[Danielle.Risse@hdrinc.com](mailto:Danielle.Risse@hdrinc.com)>; Arsenijevic, Jelica <[jelica.arsenijevic@hdrinc.com](mailto:jelica.arsenijevic@hdrinc.com)>; Ruth, Monica <[Monica.Ruth@hdrinc.com](mailto:Monica.Ruth@hdrinc.com)>

**Cc:** Kalaskar, Tanya <[Tanya.Kalaskar@hdrinc.com](mailto:Tanya.Kalaskar@hdrinc.com)>; Edwards, Dawn <[Dawn.Edwards@hdrinc.com](mailto:Dawn.Edwards@hdrinc.com)>

**Subject:** RE: AB 52 Consultation - Test Pits/Trenching

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Hi all – Traditionally, we have given the tribes 30 days to respond to the AB 52 letter indicating that they would like to enter into consultation. From there, we've worked to address their issues while we prepare the EA/IS. So I think Danielle's 60-day can be accomplished. But lets give them 30 days to respond to the AB 52 letter and then for those tribes that want to consult, we can work through their concerns. We would finish AB 52 consultation with the completion of the Final IS/MND, which would be around December.

Ali

-----  
Alicia Forsythe | Environmental Planning and Permitting Manager | Sites Project Authority | 916.880.0676 |  
[aforsythe@sitesproject.org](mailto:aforsythe@sitesproject.org) | [www.SitesProject.org](http://www.SitesProject.org)

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**From:** Risse, Danielle <[Danielle.Risse@hdrinc.com](mailto:Danielle.Risse@hdrinc.com)>

**Sent:** Monday, July 11, 2022 3:32 PM

**To:** Arsenijevic, Jelica <[jelica.arsenijevic@hdrinc.com](mailto:jelica.arsenijevic@hdrinc.com)>; Ruth, Monica <[Monica.Ruth@hdrinc.com](mailto:Monica.Ruth@hdrinc.com)>

**Cc:** Kalaskar, Tanya <[Tanya.Kalaskar@hdrinc.com](mailto:Tanya.Kalaskar@hdrinc.com)>; Edwards, Dawn <[Dawn.Edwards@hdrinc.com](mailto:Dawn.Edwards@hdrinc.com)>; Alicia Forsythe <[aforsythe@sitesproject.org](mailto:aforsythe@sitesproject.org)>

**Subject:** RE: AB 52 Consultation - Test Pits/Trenching

Hi Jelica,

I just accepted your meeting invite to chat about the schedule further with Ali.

For background, when I chatted with Dawn about schedule, I recommended 60 days to apply a bit of a buffer in case the tribes would like to consult further. My concern is that this isn't the usual Geotech activities we have consulted on before – the test pits and trenches are significantly more invasive, so the tribes may have some additional input to provide and consider. The 60 days was based on the following: 1-2 weeks to prepare/internally review/distribute letters, 30 days for the tribes to consider the letters/project, 2-3 weeks to follow up on any input from the tribes, and a start date of 7/18 (i.e., when a decent draft project description and map are available). However, we can certainly assume that AB52 will be done 30 days after we send the letters to the tribes, and assume no buffer is needed to consult. And sending letters out shortly after August 1<sup>st</sup> is not too terribly far behind the original schedule we had.

Good to hear that we are going to check in with Yocha Dehe before the letters are going out, so they will have a heads up and won't be confused by this second round of consultation after Priority 1.

Looking forward to chatting more on the upcoming call.

Thanks, Danielle

**Danielle Risse**, M.A.

Office 916-679-8796 Mobile 707-372-5007

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---

**From:** Arsenijevic, Jelica <[Jelica.Arsenijevic@hdrinc.com](mailto:Jelica.Arsenijevic@hdrinc.com)>

**Sent:** Monday, July 11, 2022 10:44 AM

**To:** Ruth, Monica <[Monica.Ruth@hdrinc.com](mailto:Monica.Ruth@hdrinc.com)>

**Cc:** Kalaskar, Tanya <[Tanya.Kalaskar@hdrinc.com](mailto:Tanya.Kalaskar@hdrinc.com)>; Edwards, Dawn <[Dawn.Edwards@hdrinc.com](mailto:Dawn.Edwards@hdrinc.com)>; Risse, Danielle <[danielle.risse@hdrinc.com](mailto:danielle.risse@hdrinc.com)>; Alicia Forsythe <[aforsythe@sitesproject.org](mailto:aforsythe@sitesproject.org)>

**Subject:** RE: AB 52 Consultation - Test Pits/Trenching

Hey there Monica

Please note that Ali / Janis / I spoke this morning. Between now and July 28<sup>th</sup>, we need to finalize the letters. Janis will review when she gets back to work on July 29<sup>th</sup>.

Dawn and Tanya are finalizing the PD...in case you need further information beyond what I edited in the attached. The PD should be finalized shortly after a thorough review by multiple folks.

Ali/Janis/I are meeting with the tribe during the week of August 1<sup>st</sup> and will give them a heads up on the activities, and let them know that the AB 52 letter(s) will be sent shortly thereafter.

Per review of notes after this mornings call, I did forget that Danielle R recommended a 60 day AB 52 period. I sent Ali (cc'd) a note on which path to take..30 day or 60 day. I suggested that we chat about it during the technical team meeting this afternoon.

Will keep you posted!

**Jelica Arsenijevic**  
Environmental Project Manager

**Due to COVID-19, I will be working from home. Please contact me via cell # listed below. Be safe out there!**



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---

**From:** Ruth, Monica <[Monica.Ruth@hdrinc.com](mailto:Monica.Ruth@hdrinc.com)>  
**Sent:** Thursday, July 7, 2022 8:25 AM  
**To:** Arsenijevic, Jelica <[jelica.arsenijevic@hdrinc.com](mailto:jelica.arsenijevic@hdrinc.com)>  
**Subject:** RE: AB 52 Consultation - Test Pits/Trenching

Here you go.

**Monica Ruth, M.A.**  
M 916-813-3060

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---

**From:** Arsenijevic, Jelica <[Jelica.Arsenijevic@hdrinc.com](mailto:Jelica.Arsenijevic@hdrinc.com)>  
**Sent:** Thursday, July 7, 2022 8:15 AM  
**To:** Ruth, Monica <[Monica.Ruth@hdrinc.com](mailto:Monica.Ruth@hdrinc.com)>  
**Subject:** RE: AB 52 Consultation - Test Pits/Trenching

Can you send me a previous letter sent to see what level of info you need (from project description)

**Jelica Arsenijevic**  
Environmental Project Manager

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**From:** Ruth, Monica <[Monica.Ruth@hdrinc.com](mailto:Monica.Ruth@hdrinc.com)>  
**Sent:** Thursday, July 7, 2022 8:14 AM  
**To:** Arsenijevic, Jelica <[Jelica.Arsenijevic@hdrinc.com](mailto:Jelica.Arsenijevic@hdrinc.com)>  
**Subject:** Re: AB 52 Consultation - Test Pits/Trenching

Ok

Monica Ruth, M.A.  
Cultural Resource Specialist  
HDR  
mobile: 916-813-3060  
[Monica.Ruth@hdrinc.com](mailto:Monica.Ruth@hdrinc.com)

---

**From:** Arsenijevic, Jelica <[Jelica.Arsenijevic@hdrinc.com](mailto:Jelica.Arsenijevic@hdrinc.com)>  
**Sent:** Thursday, July 7, 2022 8:12:49 AM  
**To:** Ruth, Monica <[Monica.Ruth@hdrinc.com](mailto:Monica.Ruth@hdrinc.com)>  
**Subject:** RE: AB 52 Consultation - Test Pits/Trenching

Hey  
Draft letter, have Janis review prior to her leaving on 12<sup>th</sup>...authority review, then you send . This may not work as we need to have a conversation with the Yocha Dehe tribe prior to sending out the letters. Timing of things

*Jelica Arsenijevic*  
*Environmental Project Manager.*

**Due to COVID-19, I will be working from home. Please contact me via cell # listed below. Be safe out there!**



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---

**From:** Ruth, Monica <[Monica.Ruth@hdrinc.com](mailto:Monica.Ruth@hdrinc.com)>  
**Sent:** Thursday, July 7, 2022 8:08 AM  
**To:** Arsenijevic, Jelica <[Jelica.Arsenijevic@hdrinc.com](mailto:Jelica.Arsenijevic@hdrinc.com)>  
**Subject:** Re: AB 52 Consultation - Test Pits/Trenching

Hi Jelica,  
Just want to be sure I'm understanding the request. Janice wants me to draft the letters for her review, and coordinate production and distribution after she and the Authority have reviewed, correct?

Monica Ruth, M.A.  
Cultural Resource Specialist  
HDR  
mobile: 916-813-3060  
[Monica.Ruth@hdrinc.com](mailto:Monica.Ruth@hdrinc.com)

---

**From:** Arsenijevic, Jelica <[Jelica.Arsenijevic@hdrinc.com](mailto:Jelica.Arsenijevic@hdrinc.com)>  
**Sent:** Thursday, July 7, 2022 6:48:30 AM  
**To:** Alicia Forsythe <[aforsythe@sitesproject.org](mailto:aforsythe@sitesproject.org)>  
**Cc:** Ruth, Monica <[Monica.Ruth@hdrinc.com](mailto:Monica.Ruth@hdrinc.com)>; Risse, Danielle <[danielle.risse@hdrinc.com](mailto:danielle.risse@hdrinc.com)>; Edwards, Dawn <[Dawn.Edwards@hdrinc.com](mailto:Dawn.Edwards@hdrinc.com)>; Lloyd, John <[John.Lloyd@hdrinc.com](mailto:John.Lloyd@hdrinc.com)>  
**Subject:** FW: AB 52 Consultation - Test Pits/Trenching

Hi Ali

See below email from Janis. With her vacation coming up she's asked that we send the AB 52 letters. I can confirm that Monica (HDR) did this last year for Janis. Should be a straightforward process as it's the same tribes. Once Janis is back, she can coordinate with tribes. We would initiate AB 52 once we have project description finalized and we coordinate with tribe, more specifically Yocha Dehe, ahead of sending the letters. We can discuss timing at next week's meeting with Janis.

Please let me know if you approve Monica sending letters. Dawn, Danielle, and I can coordinate with her .  
Thanks

Jelica Arsenijevic  
Environmental Project Manager

**Due to COVID-19, I will be working from home. Please contact me via cell # listed below. Be safe out there!**



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**From:** Janis Offermann <[janis@horizonh2o.com](mailto:janis@horizonh2o.com)>  
**Sent:** Wednesday, July 6, 2022 3:19 PM  
**To:** Edwards, Dawn <[Dawn.Edwards@hdrinc.com](mailto:Dawn.Edwards@hdrinc.com)>; Arsenijevic, Jelica <[jelica.arsenijevic@hdrinc.com](mailto:jelica.arsenijevic@hdrinc.com)>; Briard, Monique <[monique.briard@icf.com](mailto:monique.briard@icf.com)>; Tannourji, Danielle <[Danielle.Tannourji@icf.com](mailto:Danielle.Tannourji@icf.com)>; Havelaar, Christiaan <[Christiaan.Havelaar@icf.com](mailto:Christiaan.Havelaar@icf.com)>  
**Cc:** Kalaskar, Tanya <[Tanya.Kalaskar@hdrinc.com](mailto:Tanya.Kalaskar@hdrinc.com)>; Risse, Danielle <[danielle.risse@hdrinc.com](mailto:danielle.risse@hdrinc.com)>; Lloyd, John <[John.Lloyd@hdrinc.com](mailto:John.Lloyd@hdrinc.com)>  
**Subject:** RE: [EXTERNAL] RE: Test Pits/Trenching CEQA Schedule

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Hi, Jelica and Dawn  
Sorry for the late reply; it has been a busy day.

The time frame for the AB 52 letters seems good. Unfortunately I will be out of the country from July 12-28, which will make it difficult for me to get the letters out on the 18th. I would like to suggest, if possible, that HDR prepare a letter (Monica Ruth did a nice job last time) for me to review prior to my departure and then send them out on the 18<sup>th</sup>. I know this doesn't give HDR much time, but getting it done by the 11<sup>th</sup> would then give the Authority plenty of time to review it before it goes out. I have a couple of deliverables I need to finish before I leave, otherwise I would volunteer to do it myself. Once I return from vacation I can fully dedicate myself to this and do follow up emails in early August, etc. LMK what you all think about this approach.

Jelica, I will look forward to our meeting on Monday, to discuss moving forward with the geotech work.

Thanks  
Janis

Janis Offermann, MA, RPA

Cultural Resources Practice Lead  
Horizon Water and Environment  
1800 7<sup>th</sup> Street, Suite 100  
Sacramento, CA 95811  
530.220.4918

---

**From:** Edwards, Dawn <[Dawn.Edwards@hdrinc.com](mailto:Dawn.Edwards@hdrinc.com)>

**Sent:** Wednesday, July 06, 2022 10:39 AM

**To:** Janis Offermann <[janis@horizonh2o.com](mailto:janis@horizonh2o.com)>; Arsenijevic, Jelica <[jelica.arsenijevic@hdrinc.com](mailto:jelica.arsenijevic@hdrinc.com)>; Briard, Monique <[monique.briard@icf.com](mailto:monique.briard@icf.com)>; Tannourji, Danielle <[Danielle.Tannourji@icf.com](mailto:Danielle.Tannourji@icf.com)>; Havelaar, Christiaan <[Christiaan.Havelaar@icf.com](mailto:Christiaan.Havelaar@icf.com)>

**Cc:** Kalaskar, Tanya <[Tanya.Kalaskar@hdrinc.com](mailto:Tanya.Kalaskar@hdrinc.com)>; Risse, Danielle <[danielle.risse@hdrinc.com](mailto:danielle.risse@hdrinc.com)>; Lloyd, John <[John.Lloyd@hdrinc.com](mailto:John.Lloyd@hdrinc.com)>

**Subject:** RE: [EXTERNAL] RE: Test Pits/Trenching CEQA Schedule

Please see attached...

Dawn Edwards  
M 360.460.9581

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**From:** Edwards, Dawn

**Sent:** Wednesday, July 6, 2022 9:46 AM

**To:** Janis Offermann <[janis@horizonh2o.com](mailto:janis@horizonh2o.com)>; Arsenijevic, Jelica <[jelica.arsenijevic@hdrinc.com](mailto:jelica.arsenijevic@hdrinc.com)>; Briard, Monique <[monique.briard@icf.com](mailto:monique.briard@icf.com)>; Tannourji, Danielle <[Danielle.Tannourji@icf.com](mailto:Danielle.Tannourji@icf.com)>; Havelaar, Christiaan <[Christiaan.Havelaar@icf.com](mailto:Christiaan.Havelaar@icf.com)>

**Cc:** Kalaskar, Tanya <[Tanya.Kalaskar@hdrinc.com](mailto:Tanya.Kalaskar@hdrinc.com)>; Risse, Danielle <[danielle.risse@hdrinc.com](mailto:danielle.risse@hdrinc.com)>; Lloyd, John <[John.Lloyd@hdrinc.com](mailto:John.Lloyd@hdrinc.com)>

**Subject:** RE: [EXTERNAL] RE: Test Pits/Trenching CEQA Schedule

Hi all –

I spoke with Danielle Risse and built this updated schedule that includes AB52 consultation. The idea is to begin when we have a draft project description, as that should be sufficient to develop letters to tribes. We've given 8 weeks to finish the AB52 process (Row 28 of schedule) to allow for responses and coordination, as necessary – this aligns with our final team coordination meeting to resolve any outstanding open items leading into 2<sup>nd</sup> Admin draft. The schedule ends up being July 18<sup>th</sup> to September 9<sup>th</sup>.

Will this work with your schedule, Janis?

Thank you!  
Dawn

Dawn Edwards  
M 360.460.9581

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---

**From:** Janis Offermann <[janis@horizonh2o.com](mailto:janis@horizonh2o.com)>

**Sent:** Wednesday, July 6, 2022 9:21 AM

**To:** Arsenijevic, Jelica <[Jelica.Arsenijevic@hdrinc.com](mailto:Jelica.Arsenijevic@hdrinc.com)>; Briard, Monique <[monique.briard@icf.com](mailto:monique.briard@icf.com)>; Tannourji, Danielle <[Danielle.Tannourji@icf.com](mailto:Danielle.Tannourji@icf.com)>; Havelaar, Christiaan <[Christiaan.Havelaar@icf.com](mailto:Christiaan.Havelaar@icf.com)>

**Cc:** Edwards, Dawn <Dawn.Edwards@hdrinc.com>; Kalaskar, Tanya <Tanya.Kalaskar@hdrinc.com>; Risse, Danielle <danielle.risse@hdrinc.com>; Lloyd, John <John.Lloyd@hdrinc.com>

**Subject:** RE: [EXTERNAL] RE: Test Pits/Trenching CEQA Schedule

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Hi, Jelica

As you noted in your earlier email, AB 52 consultation is “not currently not captured in schedule but will be revising it to clearly incorporate.” Has the schedule been revised to include AB 52? If not, can you please tell me the time frame you are shooting for?

Thanks

janis

---

**From:** Arsenijevic, Jelica <Jelica.Arsenijevic@hdrinc.com>

**Sent:** Wednesday, July 06, 2022 8:44 AM

**To:** Briard, Monique <monique.briard@icf.com>; Tannourji, Danielle <Danielle.Tannourji@icf.com>; Havelaar, Christiaan <Christiaan.Havelaar@icf.com>; Janis Offermann <janis@horizonh2o.com>

**Cc:** Edwards, Dawn <Dawn.Edwards@hdrinc.com>; Kalaskar, Tanya <Tanya.Kalaskar@hdrinc.com>; Risse, Danielle <danielle.risse@hdrinc.com>; Lloyd, John <John.Lloyd@hdrinc.com>

**Subject:** [EXTERNAL] RE: Test Pits/Trenching CEQA Schedule

Hello Monique/Danielle/Christiaan/Janis

Following up on the email sent last week regarding schedule for your CEQA support. Please let us know if you can meet the schedule. We can certainly set up a meeting to discuss too. Its imperative that we hit the schedule in order for the Authority Board to approve the project at end of year. Obtaining data from the test pits/trenching/dozer activities is critical for the project.

Dawn/Tanya can provide guidance on what the bio/cultural CEQA chapters should look like.

We can discuss during today's geotech check in meeting too.

**Jelica Arsenijevic**  
*Environmental Project Manager*

**Due to COVID-19, I will be working from home. Please contact me via cell # listed below. Be safe out there!**



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---

**From:** Arsenijevic, Jelica

**Sent:** Monday, June 27, 2022 9:33 AM

**To:** Monique Briard (<monique.briard@icf.com> <monique.briard@icf.com>); Tannourji, Danielle <Danielle.Tannourji@icf.com>; Havelaar, Christiaan <Christiaan.Havelaar@icf.com>

**Cc:** Janis Offermann <janis@horizonh2o.com>; Edwards, Dawn <Dawn.Edwards@hdrinc.com>; Kalaskar, Tanya <Tanya.Kalaskar@hdrinc.com>; Risse, Danielle <danielle.risse@hdrinc.com>

**Subject:** FW: Test Pits/Trenching CEQA Schedule

**Importance:** High

Morning Monique, Danielle T, Christiaan

I am hoping that the ICF/Authority scoping process for geotech test pits/trenching/dozer support gets finalized fairly quickly – rumor is in a couple days. As we wait, I wanted to share with you the schedule we've developed. As you can see, we are aiming to get the CEQA document approved by the board in December, and on the ground activities beginning in January.

Assuming that the scope amendment process goes quickly, and finalized by end of week, please confirm that the ICF team can meet the schedule with the bio and cultural chapters (including cultural sensitivity report [Far Western]). Also, we need Janice to support us ASAP with AB 52 consultation (currently not captured in schedule but will be revising it to clearly incorporate).

Please let us know if you have any questions/concerns.

**Jelica Arsenijevic**  
*Environmental Project Manager*

**Due to COVID-19, I will be working from home. Please contact me via cell # listed below. Be safe out there!**



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# **Political Facts of Life and the Sites Reservoir Project**

By

William R Vanderwaal, P.E.

Systems Architecting and Engineering 550

Systems Architecting and the Political Process

University of Southern California

December 6, 2017

## **Abstract**

Political “Facts of Life”, defined in the University of Southern California’s SAE-550 course as a set of principles or “analytical concepts” that influence and control projects, can be found in all projects undertaken by any level of organization. These principles can be applied to a project, whether they are being related to internal politics or external politics, and furthermore can be applied with any manner of agency from special district on up to the federal level. These “Facts of Life” have been defined into five primary principles that can be found in virtually every project and also other less frequent “additional” facts of life. This paper will analyze how the Political “Facts of Life” have affected the Sites Reservoir Project.

The Sites Reservoir Project is currently at a place where the Sites Joint Powers Authority (Sites JPA), has applied for more than \$1.6 billion in state grant funding from the Proposition 1, Water Storage Investment Program (WSIP) and is poised on the brink of rapidly accelerating into a \$5 billion project to build a 1.8 million acre-feet reservoir in northern California. The Sites JPA has undergone a significant transition in the past five years, adding some thirty investor districts, agencies or companies from throughout California to a project that already included State of California and US Federal Agencies to the stakeholder list. This paper will attempt to discover and analyze how the Political “Facts of Live” have affected Sites through document research and interviews with key participants in the formation process. It will also demonstrate that the Political “Facts of Life” can be found at all levels of governing agency, whether federal, state or lower level entity. Finally, it will explore potential future occurrences when the Political “Facts of Life” may come in to play as the project moves forward and offer some potential mitigation measures should they arise.

Mr. Vanderwaal is the Deputy General Manager for Reclamation District No.108 and serves as the Districts representative on the Sites Project “Reservoir Committee”. He has been involved with the Sites Project since he worked for the Bureau of Reclamation where he was a Project Manager for infrastructure construction projects. He received his Bachelor’s Degree in Civil Engineering from Washington State University in 1998 and is a registered Professional Engineer in both California and Washington.

### Introduction

Water in California has always been a highly politicized resource, from the early days when the Jesuits established Missions to modern day where environmentalists, farmers, and city dwellers all have struggled with how, when and where it is used. The recent drought years of 2013 through 2015 have exacerbated the struggles over it and one of the results to come out of the drought has been the passing of California Proposition 1, which is a \$7 Billion bond that included \$2.7 Billion in funding specifically dedicated to water storage projects, including surface water storage projects. One of the projects that have applied for some of that funding is known as the Sites Reservoir Project. It and how it has been affected by the political “Facts of Life”, and how it could potentially be affected in the near future is the subject of this paper.

Sites Reservoir is proposed to be a 1.8 Million Acre-Feet (MAF) reservoir intended to provide water resource reliability and flexibility for beneficial users of all types; Municipal & Industrial (M&I), Agricultural and Environmental uses. It is designed to be “offstream” which means water would be diverted to it from existing and planned pumping plants. Offstream also means that it does not block fish passage which is one of the significant environmental impacts that most reservoirs cause. It is to be located in the foothills on the west side of the Sacramento River Valley (Figure 1) and would receive primarily excess winter flows of the Sacramento River from the Red Bluff Pumping Plant via the Tehama-Colusa Canal (TCC), the Glenn-Colusa Irrigation District (GCID) Pumping Plant near Hamilton City and a new construction pumping plant known as the Delevan Pumping Plant which would be north of Colusa. The current cost estimate is anticipated to be \$5.176 Billion for the full project of which the Sites JPA has applied for \$1.662 Billion in Proposition 1 funding. (CWC, 2017)

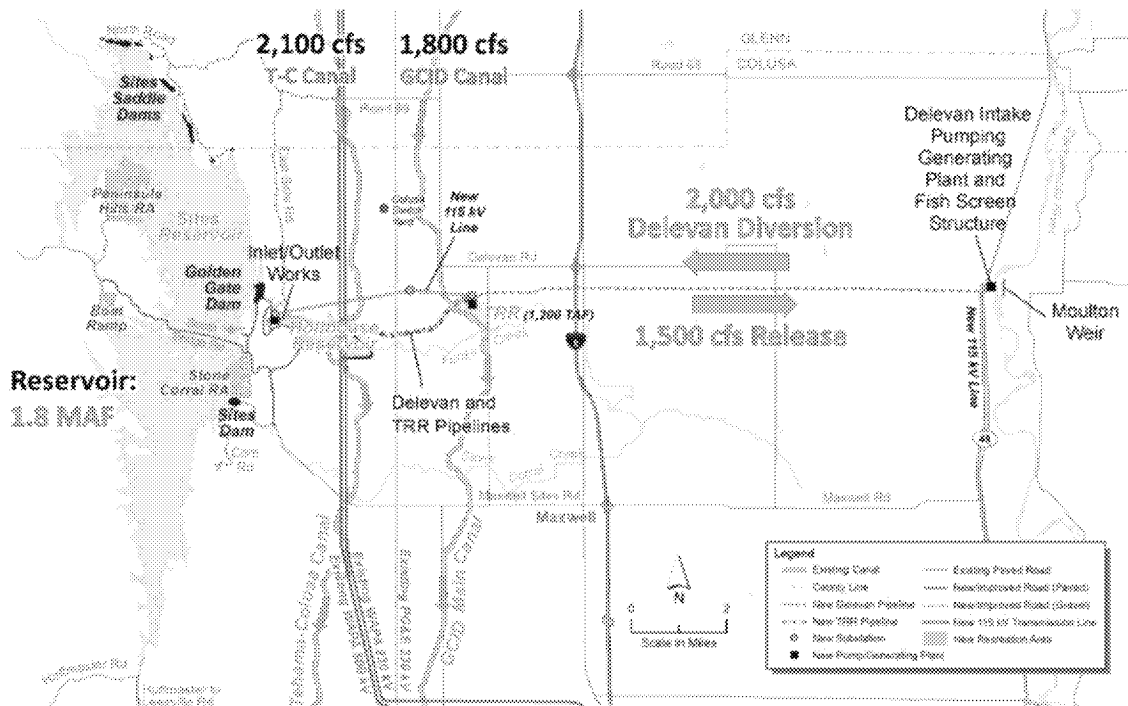


Figure 1 Sites Reservoir Project (USBR, 2017)

The birthplace of Sites Reservoir can be traced back to the document published by former United States Geological Survey “Chief Geographer of the Topographic Branch” (Col. Marshall, 1919), Col. Robert Bradford Marshall, “Irrigation of Twelve Million Acres in the Valley of California”, now known as the Marshall Plan of 1919. In this visionary plan to provide irrigation for 12,000,000 acres of farmland in the Central Valley, he proposed a dam near Red Bluff that would capture the flood waters and feed into two “Grand Canals” one down each side of the Sacramento River Valley (Figure 2), the west one feeding eventually into the Concord Valley (Col. Marshall, 1919). His proposal also included smaller basin dams that would capture streams coming into the valley above the Grand Canals which is where modern day Sites Reservoir is located. In his plan he estimated costs of the whole project to amount to around \$6 Billion which he justified by pointing to the number of jobs it would have created along with providing a strategic benefit of populating California to ward off the threat of invasion, apparently a concern at that time. (Col. Marshall, 1919) His plan was not immediately taken seriously and he retired to his farm in Patterson. (DWR, 2008) However, in 1921 the state government began to look more seriously at water development in the state and his plan eventually influenced what would become the Central Valley Project (CVP) and so Col. Marshall became known as “the father of the Central Valley Project”. (Stene, 2015)

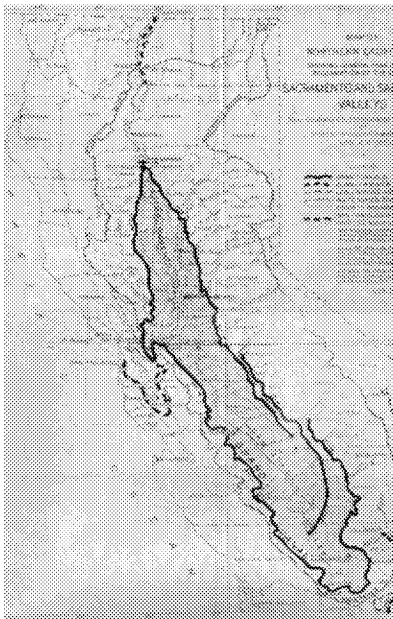


Figure 2 Marshall Plan of 1919 (Col. Marshall, 1919)

In 1930, the DWR published their Bulletin No.25 which was a report to the State Legislature of 1931 regarding the plan for California’s water development and became the initial “California State Water Plan” along with 13 other reports that had been prepared since the Marshall Plan of 1919. While it addressed the entire state, of particular interest to this paper is how it described a water plan that included 24 surface storage units in the Sacramento River Valley and more in the San Joaquin Valley. These surface storage units included the area of what would eventually be incorporated into the

current footprint for Sites Reservoir. The bulletin also described how there was a vast surplus of flows available and that they typically occurred primarily in the winter months of December through March. (DWR, 1930)

The history of the Central Valley Project goes back in the nineteenth century and is heavily intermingled with the story of Sites Reservoir and thus merits description here. Part of the CVP was the construction of Shasta Dam for both flood control purposes and beneficial water use purposes. Along with Shasta Dam came the construction of Sacramento Canal Units, which are the canals that serve CVP water to the west side of the Sacramento Valley. Shasta Dam was constructed from 1938 to 1945 and includes Keswick Dam as a regulating reservoir downstream to provide consistent river flows by capturing variable flows caused by power generation from the larger Shasta Dam. These dams effectively cut off the spawning habitat for the Winter Run Chinook salmon in the Sacramento River, who formerly spawned in the Mc Cloud River, which is upstream of Shasta Dam. However, at the time of construction, water supply and flood control were higher priorities and Shasta now provides a significant portion of the CVP's annual 7.4 Million Acre-Feet (MAF) of water each year throughout California as well as having prevented more than \$5 Billion of flood damage. (USBR, 2011)

The Sacramento Canal Units were authorized by Congress in 1950 with construction of the Corning Canal starting in 1957 and the much larger Tehama-Colusa Canal in 1965. These canals were initially gravity fed by the Red Bluff Diversion Dam, constructed in 1967 but more recently are fed by a screened pumping plant constructed in 2009-2013. The reason the diversion dam was decommissioned in 2013 is due to the impacts it had on migrating salmon which were unable to pass it when it was diverting water to the canals. (USBR, 2011)

In 1957 the DWR updated "The California Water Plan" with the publication of Bulletin No.3 in May of that year. This bulletin included a proposed "Golden Gate Reservoir" which would have been 48 Thousand Acre-Feet (TAF) in storage and would have been located in a portion of the current Sites Reservoir footprint. (Sites JPA, 2017) This and the other "West Side Stream Group" reservoirs were primarily intended to provide minor flood control and recreational use. (DWR, 1957) However, a subsequent investigation done in 1964 by the DWR found that these small dams were not economically feasible for flood control purposes. (DWR, 1964)

It was during this period of time that the California State Water Project (SWP) was begun. After World War 2 California was experiencing a population boom in its larger metropolitan areas, such as San Francisco Bay and even more so in the Los Angeles area. More water was needed to support the people and agriculture required to feed them. The State responded by building Oroville Dam on the Feather River in 1957 and then in later years the California Aqueduct which would convey the waters to points south of the delta including Los Angeles and other Southern California cities. (DWR, 2008)

The influence of these two water project heavyweights have had on Sites Reservoir cannot be understated. They both provide water to south of delta users from northern

watersheds and they do it via two massive sets of pumping plants that are located in the southerly end of the Sacramento/San Joaquin River Delta, which lies just “upstream” of the San Francisco Bay Estuary. Harvey O. Banks Pumping Plant’s 11 pumps, which feed the California Aqueduct are capable of moving 10,300 cfs from the Delta (WEF, 2016) while the USBR’s C.W. “Bill” Jones Pumping Plant can move a further 4,250 cfs from the Delta (USBR, 2016). This author has heard it said that during certain times of year, if both plants ran at full capacity, the Delta would flow backwards. Both of these pumping plants have been in service since the mid 1960’s and someone looking at a map of the two projects can see Col. Marshall’s plan reflected in them (Figure 3).



Figure 3 California's Water Systems (CVP Yellow SWP Red) (Austin, 2017)

Also in 1964, the USBR conducted an investigation to see if a 1.2 MAF reservoir located at Sites would be economically feasible to serve areas of the Tehama-Colusa Canal that are located downstream of Funks Reservoir, the regulating reservoir on the canal system. (Sites JPA, 2017)

During 1978 the DWR published a progress report on Delta Facilities under the title of Bulletin No.76 which included the concept of a 3.2 MAF reservoir known as the “Colusa Reservoir” within which the modern day Sites footprint would fit (Figure 4). Water for

this reservoir would be diverted via the Tehama-Colusa Canal and Glenn-Colusa Irrigation District (GCID) canals. (DWR, 1978)

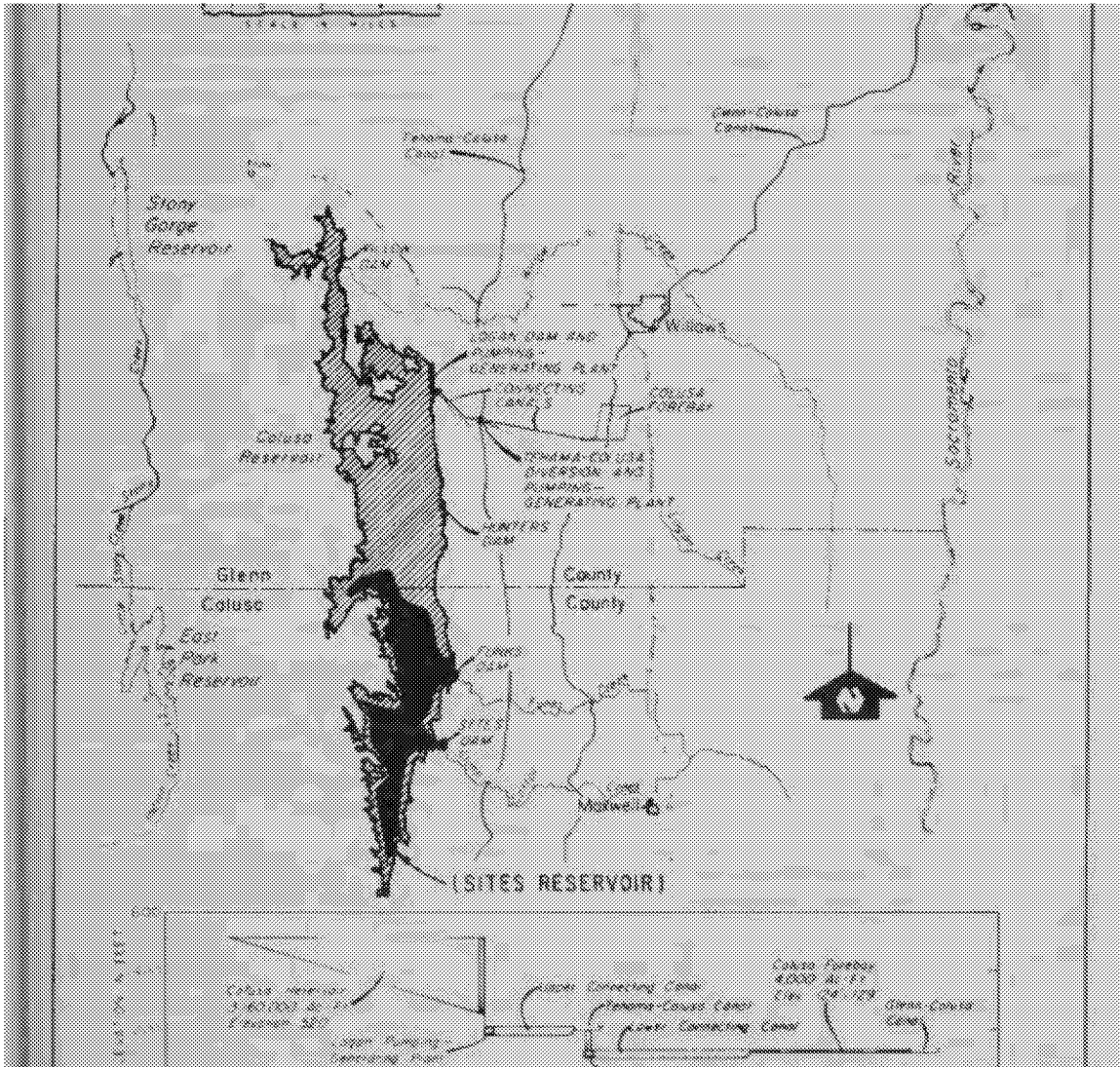


Figure 4 - Colusa Reservoir 1978 (DWR, 1978)

Local agencies also conducted analyses of storage facilities located on the west side of the Sacramento Valley. These include an analysis done by GCID in 1980 and the Colusa Basin Drainage District in 1995. (Sites JPA, 2017)

During the years 1987 to 1992 things changed for all of California's water when six years of drought struck and water deliveries were slowed, water quality in the Delta (Figure 5) was affected and wildlife populations plummeted, in certain cases such as the Delta Smelt and Winter Run Chinook Salmon, to near extinction. The period was very chaotic resulting in State and Federal officials entered the scene with four Federal Agencies (USBR, Environmental Protection Agency (EPA), NOAA Fisheries, and U.S. Fish and Wildlife Service (USFWS)) forming a group called "Club Fed" who eventually joined forces with the State after the State lost a protracted legal battle over Delta water quality



During 2005-2006 there was a significant effort to revitalize the CALFED program (CALFED, 2007) which also included formation of a Bay-Delta Conservation Plan (BDCP) Steering Committee. (WEF, 2016) This led into the passing of the Bay-Delta Legislation in 2009 which incorporated “co-equal goals” of water supply reliability and ecological restoration. It included transition from CALFED to the Delta Stewardship Council as CALFED had ceased to be a viable entity. This legislation was significant in that it was specifically written with Sites Reservoir in mind to enable local agencies to form Joint Power Authorities (JPA) to move storage projects forward (Bair III, 2017). It is also interesting to note that the State Legislature statutorily voted to shift “midnight” of the last legislative day of the session to 3 AM the following day in order to allow enough negotiating time to pass the legislation. One of the facets of the legislation was a bond to raise funds for storage projects, but the bond was delayed due to the economic conditions of the time. This became the Proposition 1 Bond which was passed in 2014 and allocates \$2.7 Billion for Water Storage Projects. It is known as the Water Storage Investment Program or WSIP for short. (Sutton, 2017)

Another significant event occurred in this timeframe which was the 2006 “temporary” restraining order on the SWP pumping operations from the Banks Pumping Plant. This reduction effectively reduced the annual water availability for SWP users from 80% of their authorized annual yield down to 60%. This was a significant reduction for those districts reliant on the SWP. (Kunde, 2017) One concept that has captured the interest of those SWP users located south of the Delta is the idea of moving water around the Delta. In the 1970’s the State pushed the concept of a “Peripheral Canal” (Hundley, 2001) which would move water from the Sacramento River Basin, including the Feather River, around the Delta to the Aqueduct and canals that carry SWP and CVP water to points south. (WEF, 2016) This was defeated in several attempts but the concept persists to the current effort which is known as California Water Fix, which formed out of the Bay-Delta Conservation Program. The modern California Water Fix concept is a tunnel or set of tunnels which would carry Sacramento River Basin water underneath the Delta while allowing environmental flows to be maintained within the Delta itself (Figure 6). (CNRA, 2010-2017)

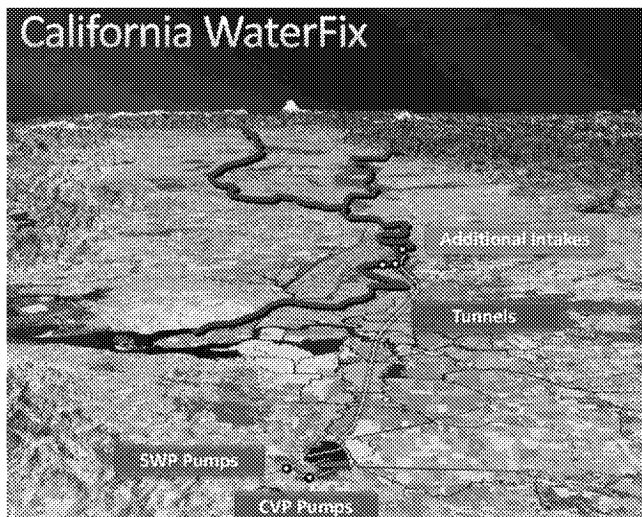


Figure 6 - California WaterFix (Austin, 2017)

In 2010 the Sites Reservoir Joint Powers Authority (Sites JPA) was formed by the following districts and agencies; GCID, Reclamation District No.108, Maxwell Irrigation District, Glenn County, Colusa County and the Yolo County Flood Control and Water Conservation District (YCFCWCD) with the purpose to move the Sites Reservoir Project forward. The counties of Glenn and Colusa were important inclusions in the JPA because they have land use authority. (Sutton, 2017)

Meanwhile, the DWR was preparing a Preliminary Administrative Draft EIS/EIR which examined three alternatives, labelled 'A' through 'C'. The most significant difference between the three alternatives the DWR analyzed and the fourth alternative, 'D', that the JPA is currently moving forward with is the operations of the reservoir and who would benefit from those operations. Alternative A and B did have certain differences in facilities or overall size from C and D. (Sites JPA, 2017) The DWR preferred option of the 2013 Preliminary Administrative Draft EIS/EIR would have provided more benefit to the SWP, though it would have benefited all users to some degree. (DWR, 2017)

In November of 2013 the Sites JPA reached out to the USBR and the organizations both signed a Memorandum of Understanding between them to move the Sites Project forward with the USBR acting as the NEPA lead agency as part of its ESA responsibility. (Welsh, 2017) Meanwhile, the Sites JPA also requested the State DWR delegate its role as CEQA Lead Agency to the JPA, which was eventually done in 2017. (Sutton, 2017) Another part of the USBR's responsibility under CALFED was to conduct a Feasibility Study, which also included a further DEC Report that was completed in 2014. (Welsh, 2017) The Draft Feasibility Study was completed in August of 2017 (USBR, 2017) in time to be released for the public review in conjunction with the WSIP application and Draft EIS/EIR.

As momentum began to build, the Sites JPA began to reorganize itself in preparation for moving forward a significant project. During the summer of 2015 the JPA took steps to hire a General Manager (GM), James Watson, prior to this the JPA Board Members and the GM's of member Districts collaborated to move things forward. The decision of who to hire as GM was a very contentious issue at the time with the JPA Board being split primarily between Districts that are senior water rights holders and the counties aligned with junior water right holder Districts affiliated with the TCCA. The division was nearly deep enough to break the JPA apart. (Bransford, 2017) It was this time also that additional investor Districts joined the JPA. Initially the additional members were required to commit to funding 20 TAF in order to have a seat on the JPA Board, which worked for several Districts, but six smaller Districts joined together to invest a total of 20 TAF and then share a seat on the JPA. It was also around this period where the YCFCWCD dropped off the JPA Board. (Sutton, 2017)

Some of the priorities that Mr. Watson had to achieve early in his tenure as GM for the Sites Reservoir Project included establishing the by-laws, recruitment of more investors in the project and preparing the Project to apply for the WSIP funding. (Bransford, 2017)(Sutton, 2017) In late 2015 and February of 2016 Mr. Watson conducted presentations to the SWP Contractors meetings in an effort to recruit investors. He also

visited with numerous other agencies throughout the state. (Kunde, 2017) The results of his efforts brought investment throughout the state including agencies located within 39 of California's 51 Congressional Districts. Additionally, the JPA was able to successfully apply for Proposition 1 funding and is waiting for the results that will be released in June 2018. (Sites JPA, 2017)

The Sites Project is now organized into two primary governing bodies, the Sites JPA Board, membership to which is allowed only to organizations located within the Sacramento River Basin in accordance with the Bay-Delta Legislation that originally enabled local agencies to form JPA's. The other governing body is known as the Reservoir Committee which is comprised of all the investors regardless of location. It is through the Reservoir Committee investments that the funding will come for the project and those investments will be used to match any Proposition 1 funding and/or Water Infrastructure for Improvements to the Nation Act (WIIN) funds, which is a Federal low interest loan and funding program. The Reservoir Committee actively functions as more of a technical oversight and the JPA Board retains the ultimate policy authority. This configuration allows districts to have a say in the project they are so heavily investing in, while maintaining security that it remains a local and northern California project. In fact, the Sites JPA recently required that 25% of all investment in yield be done by agencies within the basin<sup>1</sup>.

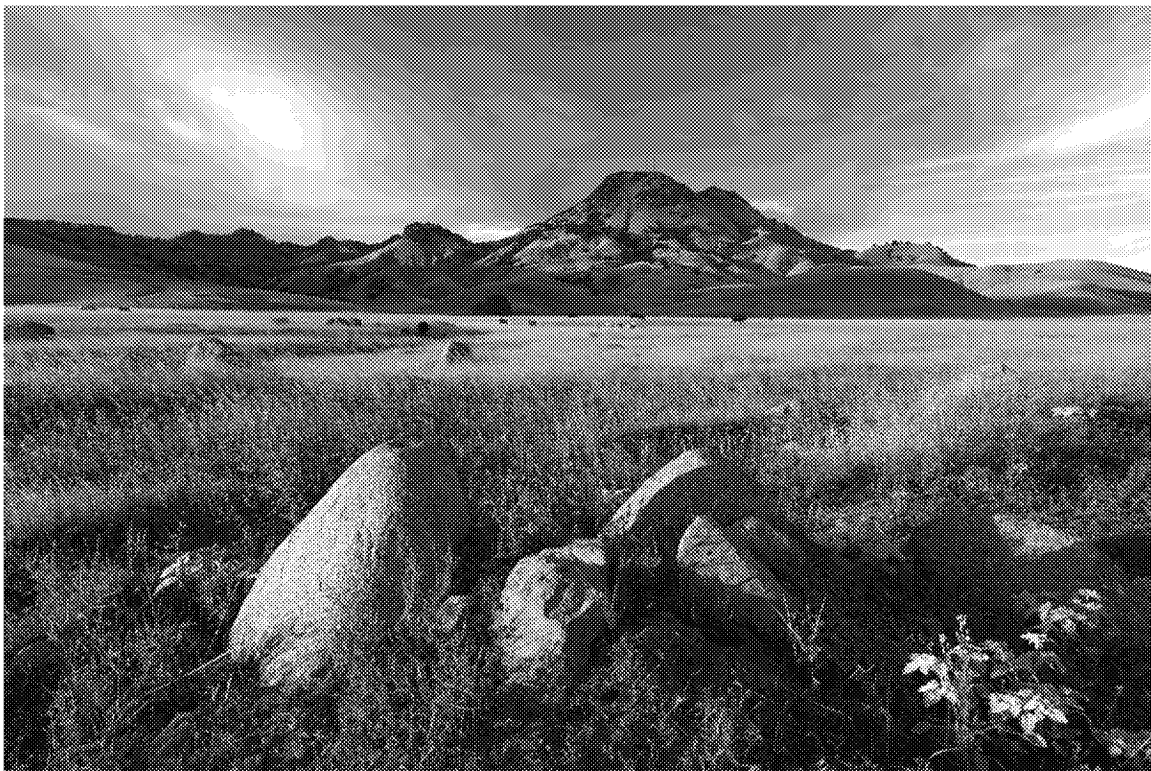


Figure 7 Antelope Valley location of Sites Reservoir today. (Sites JPA, 2017)

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<sup>1</sup> The author witnessed this report during the October Sites Reservoir Committee meeting.

## **Analysis**

As the narrative demonstrates, water in California is always a highly politically charged topic and certain political “facts of life” (FOL) are demonstrated at all stages of projects life and at all levels of government, from the Federal down through the State and into the local level agencies.

FOL1 – Politics, not technology, controls what technology is allowed to achieve. This political “fact of life” is typically demonstrated by political constraints that are placed on a program or project which limit what can be done. Examples of this include limiting timelines, limiting funding, placing regulatory requirements and requiring difficult or impossible goals. The reverse effect of this FOL would be considered creating an environment that enables great success, examples of which might include executive mandates to achieve the goal and the application of resources required to obtain it, such as happened with the NASA ‘man to the moon’ effort of the 1960’s.

This particular FOL is very evident in the history and current events of the Sites Reservoir Project. One prime example is the State Legislature’s statutory change of the day’s end to 3 AM, from midnight, in order to allow the time necessary to negotiate and pass the Bay-Delta Legislation in 2009. (Sutton, 2017) This legislation was specifically written with the Sites Project in mind (Bair III, 2017). In this case the technology isn’t necessarily technology *per se*, but the process which the legislature uses. If the legislature didn’t have the additional time to negotiate, the Bay-Delta Legislation may not have become law and Sites Reservoir Project would have stalled out. The fact that the legislature, i.e. the politics chose to extend the day enabled the project to advance and thereby controlled what the “technology” was allowed to achieve.

Another example of how politics is controlling what the “technology” can achieve is how the Bay-Delta Legislation restricted JPA membership for these projects to local agencies only. Limiting the membership to only local public agencies was done as a safeguard to prevent a recurrence similar to the Owens Valley episode where the Metropolitan Water District (MWD) purchased the majority of the water rights in the Owens Valley and then sent the water to their service area in the Los Angeles Basin, far from Owens Valley. (Reisner, 1986) The by-product of this constraint was that the local agencies that can be part of the JPA aren’t financially capable of taking on a multi-billion dollar project such as Sites Reservoir without aid from outside of the Sacramento River Valley. This constraint has forced the Sites JPA to be creative in developing a governance system that allows investment in the project while retaining the local control of the project. This has had a dual effect on the FOL #3 “A strong, coherent constituency is essential” of both strengthening the constituency by broadening it, but also has created added risk of fracturing between South of Delta investors and Sacramento River Valley investors which will be explored in that FOL discussion. If this constraint had not been placed on the project, it is conceivable that a major agency such as MWD could have taken leadership of the project and moved it to construction; they have demonstrated this capability by their construction of the 800 TAF Diamond Valley Reservoir near Hemet, CA in 1995-2000 (MWD, 2015) (Hundley, 2001). This particular FOL was further

reinforced by the Sites JPA's recent requirement that 25% of all investor owned yield from the project be owned by North of Delta constituents (Bransford, 2017). This was done in order to maintain the project as a locally led project.

The decision of the JPA to include the counties, Glenn County and Colusa County, is another example of this FOL. It is an example of positively affecting the project by politics controlling what technology can achieve because the counties have land use authority, including *eminent domain*. While the Sites JPA is very reluctant to use *eminent domain* to acquire the footprint needed to construct the reservoir, it is a necessary tool to have if a single landowner attempts to halt the project by refusing to sell their property. The fact that they have included the counties has eliminated a potential restriction to completing the project, thus politics is enabling (affecting) what the project can achieve.

Another example of this FOL helping out the Sites Project is when the State Legislature passed the Bay-Delta Legislation in 2009 they also included wording that prevented the State from contributing to raising Shasta Dam (Bransford, 2017), which is a project favored by the USBR. By doing this they effectively eliminated the "Raise Shasta Project" from competition for Proposition 1 funding, which will help Sites Reservoir. It also demonstrates politics controlling what "technology" can achieve by placing a constraint on the "Raise Shasta Project".

FOL2 – Cost Rules. This "fact of life" is distinguished by the effects of rising cost of a project or program. Increasing complexity, delays, added demands or scope, and opposition to the project or program will increase the cost to complete it and the result is often withdrawal of support by constituents, reduced funding or premature cessation of the project or program. Other complications of the FOL are staggered or phased funding of a project/program that becomes subject to political whims as administrations change.

For the Sites Reservoir Project the "Cost Rules" FOL is most evident in the eventual cost of the water that the project will yield on an annual basis. This cost will be heavily impacted by several significant factors and innumerable minor factors. Some of the more significant factors are the construction costs, the interest rates, and the participation of State and Federal entities to contributing funding and low interest loans. The higher price of water yielded caused by these factors affect which agencies are willing to invest in the project. Many Districts in the Sacramento River Valley are reluctant to pay \$600 per acre-foot of water annually, which is the current cost estimate for water from Sites Reservoir (USBR, 2017). Many of these districts have an adequate supply of water for current conditions but are weighting the future risks they see and considering Sites for an investment in their future security. Contrast that with many of the South of Delta Districts who were paying more than \$1,000 per acre-foot during the recent drought years. In 2006 when the Courts issued the temporary restraining order on pumping in the Delta (Kunde, 2017), many of the South of Delta investor Districts lost a quarter of their annual water supply and have been searching for alternate sources to make up the reduction since then. Many of them are Municipal and Industrial (M&I) suppliers who

are more easily able to afford the high investment in Sites. This difference in tolerance for higher priced water is currently causing a rebalancing of who is interested in investing in Sites and how much they are willing to invest. It is a prime case of the “Cost Rules” FOL.

Another example of the “Cost Rules” FOL is the process that the USBR has to follow in order to be authorized by Congress to participate in the project. They are required by Reclamation Law to conduct a Feasibility Study which will inform a Record of Decision (ROD) on whether they would approach Congress for Authorization to participate in the project (Welsh, 2017). The Federal Feasibility Study is typically done in two stages, which is encapsulated in a Draft Feasibility Report and the second stage Final Feasibility Report. Both reports are provided to the public for comment and participation before being forwarded to the Office of Management and Budget (OMB) for review and finally the Secretary of Interior who would then issue the ROD before being passed to Congress. If the Feasibility Report does not include a positive cost to benefit ratio, it is unlikely that Congress would allow Federal participation in the project, which would have devastating impacts to the project since the USBR is currently the lead NEPA agency and also may be able to provide low interest Federal loans to the Sites JPA. The USBR may also be able to participate in the project by funding environmental benefits and hydropower portions of the project (USBR, 2017), which would help lower the cost of water.

“Cost Rules” FOL is one that runs throughout the life of the project and needs to be carefully managed. Any delay in construction, permitting or operation could cause massive ramifications by adding hundreds of millions or even billions of dollars in interest to the project cost. The WSIP requires physical construction work to begin by 2022 (CWC, 2017) and delay in that would jeopardize the funding that they may receive from Proposition 1.

FOL3 – A strong, coherent constituency is essential. Successful projects and programs have constituencies that are able to overcome issues created by opposing constituencies and negative impacts from other FOL’s that occur over the life of the project or program. Evidence that shows constituencies are not strong and coherent include: the loss or reduction of funding, internal disputes that cause defections from the project or program, and opposing demands on the final product of the project or program. A coherent constituency will have a united purpose and focused message for the project while a strong constituency will have a broad base of support for the project that often includes parts of the group that might otherwise oppose the project.

Sites Reservoir Project has successfully applied this FOL in the endeavors to engage investor Districts from significant portions of the state outside of the Sacramento River Valley. There are currently investor Districts located in 39 of the states 51 Congressional Districts and support from Legislators in the majority of the State’s Legislative Districts (Sites JPA, 2017). This broad based support crosses political boundaries of Republican (GOP) and Democratic Party support and across the Agricultural and Urban divides that affect so many issues and projects within California. The investor list includes such

major urban districts as MWD and San Bernardino Valley Municipal Water District that are located South of the Delta and the City of Roseville located in the Sacramento River Valley, to Agricultural Districts such as GCID and Colusa County Water District which are located in the Sacramento River Valley and Wheeler Ridge-Maricopa Water Service District which is located South of the Delta. It has also garnered the support of such eminent politicians as Senator Dianne Feinstein (Democrat) to Congressman La Malfa (GOP) (Sites JPA, 2017). During 2013, the Sites JPA was engaged in lobbying Senator Feinstein who was the Chairperson of the Senate Appropriations Committee at that time (Bair III, 2017). She has become a strong proponent of the project. The project also anticipates that it will receive support from some Environmental Non-governmental Organizations (NGO) who traditionally oppose large surface storage projects but can see the advantages Sites Reservoir Project provides through its significant provision of water for environmental purposes such as waterfowl water supplies. This broad based support is a very definitive application of the FOL “A strong, coherent constituency is essential” and will serve the project well as it moves forward.

Another example of the understanding of the critical nature of having a “strong, coherent constituency” was demonstrated when the Bay-Delta Legislation was being created but the decision to wait on forwarding the bond was made. This was a critical decision that reaped rewards when the bond was eventually pushed forward. At the time of the Bay-Delta Legislation negotiations, 2009, the economy was still recovering from the recession caused by the housing market crash in 2008 (Sutton, 2017). In 2014 when the Proposition 1 bond was finally put onto the ballot the economy had recovered somewhat and a severe drought had begun in the state. This occurrence of timing correlates with another FOL that is discussed later in the paper but also served to provide a very broad based support for passing the bond election. The entire water industry was aligned to support the bond measure including the Association of California Water Agencies (ACWA) and Northern California Water Association (NCWA) who were instrumental in its passage (Bair III, 2017). This broad based support was critical in obtaining funding for future storage projects.

The Sites Reservoir Project also provides a case where the constituency was not aligned and it nearly ripped the project apart. This was when the Sites JPA Board went to select a General Manager in the summer of 2015 (Bransford, 2017). Prior to hiring a General Manager the work had primarily been done by the member agencies General Managers, especially Thad Bettner of GCID, Lewis Bair of RD-108 and Jeff Sutton of the TCCA (Bair III, 2017) (Bransford, 2017) (Sutton, 2017). The Board at the time was comprised of two camps, the Sacramento River Settlement Contractors who are agencies that include RD-108 and GCID and have senior water rights on the Sacramento River. The other camp was the TCCA Districts and the counties, some of whom were recently added to the Sites Board. Prior to selecting the General Manager the JPA had conducted a presentation with Gerald Meral who is known to be heavily influential with Governor Brown. The presentation did not go well and one of the primary presenters was also the TCCA’s preferred candidate for General Manager (Bair III, 2017). There was a

significant debate on which candidate to hire in the process with the TCCA aligned Board Members pushing for their candidate while the Settlement Contractor aligned Board Members preferred a different candidate, James Watson. In the end, Mr. Watson was selected as the General Manager and the two sides reconciled over time with a united purpose of completing the project. It was a very close run thing, though, for had the TCCA preferred candidate been selected it is likely that GCID, and possibly the other Settlement Contractors, would have left the project (Bransford, 2017).

Looking to the future of the project, it will be important for the Sites Project to continue to build their constituency, especially adding environmental NGO's as constituents. Large surface water storage projects are often vehemently opposed by environmental NGO's because of the history of significant impacts to the environment that they have. Dams like Shasta and Folsom have cut off critical spawning habitat for salmon species (Billington, Jackson, & Melosi, 2005) and Sites would impact Golden Eagle habitat with its footprint (Sites JPA, 2017). However, the project has some environmental benefits to offer with additional water dedicated to the environment, the ability to preserve the Shasta Coldwater Pool, and the lessened overall impact that comes from being an off-stream storage facility (Sites JPA, 2017). If the project can engage and enlist the support of environmental NGO's that are oriented to finding solutions it will help the project to defend itself against litigation oriented NGO's thus applying this FOL in a positive way to further the project.

FOL4 – Technical problems become political problems. Often major projects and programs run into technical issues that quickly become political problems which in turn affect the project or program. Typically, opposing constituencies will seize on the opportunity to divert funding from the project or program in question, or they'll litigate the project causing delays that escalate the cost and may cause public perception issues causing a loss of support. Examples of this FOL's negative effects include such famous events as the Space Shuttle disasters and the Apollo Mission failures that contributed to ending those programs.

Sites Reservoir Project is facing significant technical issues as it gathers momentum. One of the more significant technical problems it faces is the problem of South of Delta investors being able to move their water through the Delta. The current restrictions on pumping water out of the Delta at the SWP and CVP pumping plants severely limit those agencies in moving water south (Kunde, 2017). If these agencies are not able to move the water through the Delta, the investment will become unaffordable for them. However, if the California WaterFix is able to be moved forward, it will greatly expand the amount of water that can be moved south. This also has implications related to FOL #3 in that under its current format, the North of Delta Agencies oppose the California WaterFix while the South of Delta Agencies support it. Under the current wording of the California WaterFix operations plan and EIS/EIR, the North of Delta Agencies are concerned that they could have reduced water supply reliability (Bair III, 2017), however if they received assurances that their water supply would be protected they would change to supporting the WaterFix (Bransford, 2017). For the South of Delta Agencies, they are

concerned that North of Delta Agencies do not know how important an issue it is for them to be able to move water around the Delta (Kunde, 2017). As previously discussed in the FOL #2 “Cost Rules” section, the importance of having South of Delta investment cannot be understated. This technical issue remains to be resolved but could quickly expand into a contentiously divided constituency for the project and needs to be managed carefully.

Another technical issue that threatens the project is the California Department of Fish and Wildlife (CDFW) insistence on specific bypass flow requirements. The CDFW is asserting that certain flow rates need to be occurring in the Sacramento River before water can begin to be diverted into the reservoir. This is significant in that it will reduce the amount of water that can be diverted to the reservoir and that will in turn reduce the yield of the project. A reduction in yield will result in a higher cost of water which in turn affects the ability to afford investment in the project thus becoming a political problem for the Project. If investors begin to drop off the project it will be placed into an untenable position. This is yet another issue that requires close and careful management.

Coordination of operations of the reservoir with the SWP and the CVP will also present a technical issue that could quickly become a political problem if it is not handled well. Operation of the two projects is very sensitive politically and technically. Shasta Cold Water Pool is used to maintain temperatures for endangered fish on the CVP and requires daily adjustments to flows in the Sacramento River. Sites could be used to create more flexibility for the operations by preserving some of the Cold Water Pool, but the State and USBR may be concerned about a third entity controlling the operations. The State and USBR are currently discussing changes to the Coordinated Operations Agreement (COA) and Sites Reservoir is likely viewed as an unknown to the agencies. Many of the environmental benefits that Sites Reservoir could provide are dependent upon how the CVP is operated. For deliveries to many of the South of Delta investors, integration with SWP operations is critical but tied to the Banks Pumping Plant operations rather than Shasta Dam.

A further technical issue that could be a potential problem is ensuring that the project is adequately staffed at the correct time to ensure the project continues to move forward (Bransford, 2017). Major projects such as Sites Reservoir require large teams of engineers, managers and technicians who are capable of executing the design, permitting and constructing the project. Within the Sites Project there has occasionally been a reluctance to field more staff or consultants which is a political issue because of the perception of higher costs. Management of this issue is necessary to ensure agencies that might oppose addition of further staff understand the need, while at the same time maintaining accountability to ensure consultants don't take over the project and add unnecessary and unmanaged resources to the project, which would in turn raise the cost of the project.

FOL5 – The best engineering solutions are not necessarily the best political solutions. This “fact of life” occurs when the political will dictates a course of action that varies

from what would otherwise be technically sensible or more efficient. It differs from the first FOL in that it doesn't necessarily place restrictions, but rather dictates a different solution to the problem.

An example of this FOL on the Sites Project is the decision to leave Hydropower out of the project at the current time. Hydropower is an expensive portion of the overall cost estimate of the project (USBR, 2017) and the permitting process through the Federal Energy Regulatory Commission (FERC), if hydropower is not done by the USBR, could take as long as ten years. A ten year permitting period would cause significant cost increases in the yield of the project which would affect the investors, as discussed in FOL #2 "Cost Rules". On the other hand, if the USBR were to participate in the project by owning the Hydropower portion the Safety of Dam (SOD) process would be quicker (Welsh, 2017) but that has an issue risk of its own in that the local agencies will no longer own or control that portion of the project (Bair III, 2017). The best engineering solution would be to include hydropower, but the better political solution has been determined to be leaving it out while still building facilities that could accept it at a later date.

Another challenge with this FOL that the Project is facing is getting agencies like the DWR and CDFW to understand that with this project they will have a block of water easily at their disposal to use as they see fit. Under the proposed plan, up to 41% of the annual yield from Sites Reservoir will be "owned" by the State and can be used for environmental purposes or to fill whatever need the State prioritizes (CWC, 2017). This is a technical opportunity that could become a political benefit to the Project, however the agencies seem to be slow to understand this benefit and care needs to be taken by the Sites Project to educate the agencies on this benefit.<sup>2</sup>

Engineering a new reservoir on a stream would be easier than building a reservoir off-stream like Sites is located. Sites has very little natural runoff and the primary method of getting water into the reservoir is by pumping water up to it from the Sacramento River via the TCCA and GCID canals. However, off-stream storage is actually more politically preferable because of the significant impacts that previous on-stream reservoirs have had on the environment, particularly migrating fish (Billington, Jackson, & Melosi, 2005). This is an example of how the better technical solution, on-stream storage, is not the better political solution which is off-stream storage.

Contingency plans are often created in response to this FOL. The Sites Project doesn't formally have a public contingency plan, however, if funding should become an issue there is a political solution which would be reducing the reservoir size from 1.8 MAF down to 1.2 MAF. The scenario where this would happen is one where the yield is impacted by political pressure such as the bypass flow requirements previously discussed. A 1.2 MAF is not the best "technical solution" but may be the best "political solution" under those conditions. It would still provide a water supply and would cost less, which incorporates FOL #2 "Cost Rules". The resulting reduction would also likely be

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<sup>2</sup> Observation from multiple Reservoir Committee meeting by the author.

accompanied by reduced participation in the project (less investment and investors) which could negatively impact the Project as seen in FOL #3 “A strong, coherent constituency is essential” by the reduced support and participation.

FOL – Timing is everything. This “fact of life” is not considered one of the five primary Political Facts of Life that the course focuses on however, it is an additional one that occurs on projects frequently and can be found on the Sites Project. This FOL is typically observed when events coincide in a unique way to create opportunity or catastrophe for a project or program.

For Sites Reservoir the occurrence of the historic droughts in 2013 through 2015 that coincided with the Proposition 1 Bond, which should benefit the project, is an excellent example of this FOL. It is possible that without the drought, the Proposition 1 Bond may have failed to pass, however it passed with significant (67% yes vote) support throughout the state. The decision to delay the bond effort due to the economic conditions in 2009/2010 (Sutton, 2017) was fortuitous in that the political atmosphere was even more suited to passing the bond in 2014 when the drought was in progress and highly publicized throughout the state. This FOL will be tested again in the upcoming elections where more water bonds are on the 2018 ballot, but the previous year (2017) has seen record precipitation (Bair III, 2017).

Another case where the Project could conceivably benefit from this FOL is in that the Federal Government wants to support projects that will begin construction before the next presidential election (Welsh, 2017)<sup>3</sup>. The current Presidential administration has vociferously promised to promote infrastructure construction in the effort to produce jobs and economic stimulus in the country. This results in federal government agencies supporting policies that will support the execution of construction projects such as Sites Reservoir. This is an opportunity that the project could attempt to capitalize on by accelerating the design and permitting processes.

FOL – Staffers shape decision-making. This “fact of life” is also one of the additional Facts of Life that occasionally occur on projects and programs. Within the scope of the course it generally refers to Congressional Staff who will review and filter reports and information for their respective Congressmen which places them in a unique position of power and influence. A staff person who is opposed to a project or program can easily hamper its progress, funding and reputation with the member of Congress. They can also create issues for the project.

On the Sites Project there was an occurrence where Congress included a timeline for the USBR to complete the Draft Feasibility Report and Draft EIS/EIR by December 2016 (Welsh, 2017). This was reportedly done by enthusiastic Congressional Staffers who were hoping to move the project along in a positive way.<sup>4</sup> The issue this created was that the USBR claimed that it would be unable to complete the necessary revisions to the

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<sup>3</sup> This information was corroborated by the author’s observations of meetings with the USBR during the ACWA Conference in November 2017.

<sup>4</sup> Observations by author during multiple Sites JPA Board Meeting in 2016.

Draft Feasibility Report in the timeline given and that the USBR would have to use the old information that was compiled when the State DWR did their Preliminary Administrative Draft EIS/EIR in 2013 which did not contain the significant operational changes the current project was incorporating. This difference in information contained in a Draft Feasibility Report could have severely damaged the project by possible reductions in cost to benefit ratio and may have closed out the possibility of Federal participation in the project.

This paper proposes that not only Congressional Staff can have significant effects on projects and programs, but that also agency staffs can heavily influence the success of a project. In the Sites Reservoir Project case this scenario was observed by the author who saw the USBR Mid-Pacific Planning Division Lead act as an obstructionist by claiming to not have funding to conduct work on the Sites Project. This same staff person also appeared to be incapable of creating a schedule to complete work that incorporated concurrent tasks, thus prolonging the process and placing the project at risk of schedule failure.<sup>5</sup> Some of this may have been due to their heavy personal investment in the “Raise Shasta Project” and the fact that Shasta Dam is part of the CVP. These same issues were observed by others outside of the USBR (Bair III, 2017), however, the USBR has since moved forward with enthusiastic support of the project and the staff in question has since retired from government service. Even agency staff can affect a project for success or failure.

FOL – Politics prefers immediate, near-term gratification. This is another additional “fact of life” that occurs on some projects or programs. It is typified by politicians focusing on near term, immediate political benefit versus long-term benefits, at times even selecting the short term gain despite significant long term harm.

For the Sites Project there are two examples of this FOL, the first is the current Presidential Administrations desire to have physical construction work begun prior to the 2020 elections (Welsh, 2017) as previously mentioned in the discussion regarding the FOL “Timing is Everything”. The administration’s desire is clearly intended to provide projects that they can point to during the election campaigning that will support their re-election efforts. They are seeking out visible progress now, for the near-term political need, without real consideration for long-term benefits.

The other example of how this FOL applies to Sites Reservoir is the severe droughts effect on the Proposition 1 Bond and now the recovery from the drought. As described in the discussion about FOL “Timing is Everything.” the droughts made it easy to pass the Proposition 1 bond measure. Now that the drought has passed from the general public’s consciousness, it will be important for Sites to sustain the momentum in a time when 2017 was an all-time record year for precipitation. The tendency will be for the public to refrain from further funding for water storage projects until there is once again a drought. The bond or bonds that will be on the ballot in 2018 will be a telltale for the public’s attitude to water projects and the Sites Project should pay close attention to those results.

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<sup>5</sup> Observations by author during the years 2015 and early 2016.

FOL – Political problems become technical problems. This is yet another additional “fact of life” that can be found in the Sites Project. It is typified by political demands requiring changes to the technical performance, function, scope or design of a project or program.

On the Sites Project this FOL is likely to become evident as the Reservoir Committee, comprised of investor districts, transitions to more control over the engineering of the project, including operations. Parties from both the JPA Board and Reservoir Committee describe the intent of the internal political setup to be one where the JPA Board is present to provide global oversight or protect local interest while the Reservoir Committee’s role is to manage the technical aspects of the project (Bransford, 2017) (Sutton, 2017).

However, the degree to which the JPA Board inserts itself into the technical processes will need to be managed closely by the staff and others involved in the project. Many of the investor districts have significantly more experience with major projects such as Sites than do those districts on the JPA Board and it is conceivable that those districts could be perceived as manipulating the project for their own interests over the welfare of the whole project. There will also be decision points that could polarize investor districts into North of Delta vs South of Delta or CVP vs SWP lines where reservoir operations are not technically capable of meeting the demands that the political alignments impose.

## **Summary**

This paper has investigated and demonstrated that the Political “Facts of Life” from SAE-550 have affected the Sites Reservoir Project in its life to date and will continue to affect it as it moves forward through permitting, design construction and operations. It has also demonstrated that the “Facts of Life” can be found at all levels of government, from Federal on down to State and Local organizations.

The Sites Project is at a critical juncture of its life with the pending award of WSIP funds and the decision point that investors are facing whether to continue, reduce or increase their investment in the project. These “Facts of Life” can be anticipated, identified and controlled to enable the success of a project. This paper has further identified some of those potential occurrences and will help investor districts weigh the political risks to the project. It will also assist the project staff to identify potential political pitfalls and enable them to develop mitigation plans for those issues in advance.

The author wishes to thank the following people for their support and encouragement:

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Robert J. Kunde – Engineer Manager of Wheeler Ridge-Maricopa WSD.

Jefferey P. Sutton – General Manager of the TCCA.

Richard A. Welsh – Mid-Pacific Construction Engineer for the USBR.

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# Preliminary Evaluation of the Planning Aid Memorandum Technical Memorandum



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**To:** Alicia Forsythe, Sites Project Authority  
**CC:** John Spranza, Sites Integration  
Laurie Warner-Herson, Sites Integration  
**Date:** July 14, 2022  
**From:** ICF  
**Quality Review:** Mike Hendrick (ICF)  
**Authority Agent Review:** N/A  
**Subject:** Preliminary Evaluation of the Planning Aid Memorandum

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## 1.0 Purpose

This memorandum presents a preliminary evaluation of the August 5, 2021, Planning Aid Memorandum (PAM) provided by the U.S. Fish and Wildlife Service (USFWS) to the Bureau of Reclamation (Reclamation) for the Sites Reservoir Project (Project). The purpose of the PAM was to provide Reclamation with the USFWS's comments and recommendations regarding the Project's potential effects on biological resources for consideration in project planning and preparation of a public revised draft environmental document. The PAM was prepared under the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 *et seq.*). The Fish and Wildlife Coordination Act requires federal agencies proposing water resource development projects or involved in issuance of related permits or licenses to consult with the USFWS and provide equal consideration to the conservation, rehabilitation, and enhancement of fish and wildlife resources with other project purposes.

The PAM summarized early coordination between USFWS and Reclamation regarding potential effects of the proposed Project. It provided a high-level description of the Project and USFWS's views of potential effects of the inundation of upland habitat (i.e., upland effects), increased diversions of Sacramento River water (i.e., in-river effects), and cumulative impacts associated with implementation of other projects. The PAM also summarized information and early analysis of effects provided to the USFWS by Reclamation and identified areas and concerns where the USFWS indicated that more information or analysis was needed.

The key concerns identified in the PAM are categorized as upland effects (Section 2.0), in-river effects (Section 3.0), and cumulative impacts (Section 4.0). Responses summarizing how each key concern was addressed are provided herein. The Revised Draft Environmental Impact Report/Supplemental Draft Environmental Impact Statement (RDEIR/SDEIS) released in November 2021 contained much of the information to address these key concerns (Sites Project Authority and Bureau of Reclamation 2021). The PAM was developed based on the USFWS's review of the first administrative draft of the RDEIR/SDEIS and there were several substantive changes that occurred between the administrative draft and the publicly released RDEIR/SDEIS, which are explained below. In addition, subsequent analysis

that has been developed to date in preparation of responses to public comments on the RDEIR/SDEIS and for the development of related permitting processes was also used to address the key concerns.

It is important to note that the analysis of the comments on the RDEIR/SDEIS, the response to those comments, and the preparation of the Final EIR/EIS are ongoing. The Authority has recently changed the Project's diversion criteria and has worked with Reclamation since the issuance of the RDEIR/SDEIS to enhance the Project's anadromous species benefits, especially as reflected in the modeling framework. In addition, the Authority has moved from Alternative 1 as its Preferred Project for the purposes of the California Environmental Quality Act compliance to Alternative 3. Revised modeling is underway to reflect these adjustments and once modeling is completed, the Authority and Reclamation look forward to discussing the results and revisions to subsequent species analysis with the USFWS, National Marine Fisheries Service [NMFS], and the California Department of Fish and Wildlife [CDFW]. Therefore, the information and responses in this memorandum may change as these enhanced species protections and species benefits are incorporated into the Project.

## 2.0 Upland Effects

**Key Concern:** Provide greater specificity regarding potential mitigation lands or banks for each of the habitat types for which mitigation is proposed.

**Response:** Given the size of the Project, the Sites Project Authority (Authority) will rely on several mitigation strategies including a mix of mitigation banks and other mitigation mechanisms. The Project's Mitigation and Monitoring Plan (Plan) is under development and will be provided to the USFWS as part of the Project's Biological Assessment (anticipated summer 2022) and Final EIR/EIS (anticipated early 2023). The Plan includes a comprehensive mitigation planning strategy, implementation approach and general criteria for species and habitats based on anticipated Project impacts on regulated biological resources. As access is currently limited to less than 1% of the Project Area, a final analysis of impacts will be conducted once land access is obtained and following the final refinements of Project design and completion of on-the-ground, protocol-level biological field surveys.

Following completion of Project construction, temporary impacts will be mitigated through restoration and revegetation of areas disturbed by construction in accordance with an approved habitat restoration plan. Permanent impacts will be mitigated on site and at agency-approved (USFWS, NMFS, and/or CDFW) offsite locations. Onsite compensatory mitigation may include restoration (re-establishment or rehabilitation), establishment (creation), enhancement, and/or preservation of aquatic or terrestrial biological resources that occur within the proposed Project area. Offsite compensatory mitigation for the proposed Project may include the purchase of agency-approved mitigation/conservation bank credits, the establishment of third party-responsible "turn-key" mitigation/conservation bank projects, preservation of biological resources through conservation easements with private landowners, payments to in-lieu fee programs, or the establishment of permittee-responsible offsite mitigation sites. The methods for assessing resources in the project footprint, best management practices to be applied, tools available for mitigating effects of the Project are discussed in chapters 9 – *Vegetation and Wetland Resources*, and 10 – *Wildlife Resources* of the RDEIR/SDEIS.

The Authority has conferred with USFWS about species habitat models and used this information to estimate mitigation obligations. The Authority expects to continue to work with USFWS and Reclamation as the Project moves forward and better information becomes available to define mitigation requirements.

**Key Concern:** Provide a better description of how increases in Incremental Level 4 refuge water will be provided and the expected benefit to migratory birds.

**Response:** Providing Incremental Level 4 refuge water is an environmental benefit of the Project recognized by the California Water Commission in its authorization of State funding from the Water Storage Investment Program (WSIP). The Authority envisions that CDFW will take an active role in managing the ecosystem water and the Authority would work with CDFW to schedule and adjust releases of ecosystem water to address real-time conditions and needs. The Authority also recognizes that Incremental Level 4 refuge water would be made available to federal refuges north and south of the Sacramento–San Joaquin Delta (Delta) and as such, expects that it would provide Incremental Level 4 water to appropriate destinations based on guidance from, and coordination with the CDFW, USFWS, and Reclamation. The Authority understands that Reclamation and CDFW have an existing methodology to allocate Incremental Level 4 refuge water to the National Wildlife Refuges, State Wildlife Areas, and privately managed wetlands included in Central Valley Project Improvement Act Refuge Water Supply Program. The Authority anticipates that CDFW and Reclamation would allocate the Incremental Level 4 refuge water that results from the Project in the same way they allocate all Incremental Level 4 refuge water.

Table 1 below is from the Authority’s *Water Storage Investment Program: Sites Reservoir Project Continuing Eligibility and Feasibility Determination* report (Authority 2021). It identifies the Project’s Incremental Level 4 refuge water supply benefits in terms of water supply increases to National Wildlife Refuges, State Wildlife Areas, and privately managed wetlands projected in 2030 and 2070 as estimated based on WSIP Unit Water Values. Incremental Level 4 represents the additional increment of water required for optimal wetland habitat development on the National Wildlife Refuges, State Wildlife Areas, and privately managed wetlands included in Central Valley Project Improvement Act Refuge Water Supply Program. The benefits to migratory birds of Incremental Level 4 refuge water supply were identified as part of the original foundational documents of the Central Valley Project Improvement Act and differ for each individual National Wildlife Refuge, State Wildlife Area, and privately managed wetland.

**Table 1. Sites Reservoir Project Incremental Level 4 Refuge Water Supply Increases (2030 and 2070) (TAF/year)**

Period	North-of-the-Delta	South-of-the-Delta <sup>(b)</sup>	Total
<b>2030 Results</b>			
Long-Term Average <sup>(a)</sup>	5	11	17
Wet	0	0	0
Above Normal	9	5	14
Below Normal	9	13	22
Dry	8	27	34
Critical	6	17	23
<b>2070 Results</b>			
Long-Term Average <sup>(a)</sup>	5	10	15
Wet	0	0	0
Above Normal	9	1	10
Below Normal	7	8	16
Dry	7	10	17
Critical	6	21	27

Source: CALSIM II.

Notes:

(a) Average weighted based on water-year frequency rates

(b) Includes both San Joaquin and Tulare Lake Refuge deliveries and based on San Joaquin Valley 60-20-20 Index Year Class.

TAF = thousand acre-feet

**Key Concern:** More thorough analysis is needed of geomorphic effects of flow reduction in the higher flow range on habitat (cut bank formation, cottonwood seed dispersion/regeneration processes, wood transport) and the sensitive species that use it (e.g., bank swallows, yellow-billed cuckoo).

**Response:** The SRH-Meander model results presented in the RDEIR/SDEIS (Chapter 7 – *Fluvial Geomorphology*) suggested that the tendency for meander is not significant among the Project alternatives and the No Action Alternative (NAA). The river meandering, bank erosion, and deposition modeling concluded that there were no significant differences in the channel alignments between existing conditions and the modeled alternatives. Thus, operational impacts on the geomorphic regime (including natural river geomorphic processes such as sediment transport and bank erosion) and existing river geomorphic characteristics (e.g., sinuosity, channel gradient, substrate composition, channel width and depth, and riparian vegetation) of the greater Sacramento River system are expected to be minimal, and consequently, impacts on sensitive species would be negligible or minimal as well. The Authority will review these results with USFWS and Reclamation to determine whether additional analysis is warranted, or additional considerations will be added to the monitoring and adaptive management plans or the Project description.

**Key Concern:** Additional review may be needed of the resource protection measures identified for habitats (e.g., riparian, upland, stream, and wetland) that could support special-status species including the listed valley elderberry longhorn beetle, red-legged frog, and several rare plants, which are potentially present within the impact area.

**Response:** As stated above, verification of species' presence and habitat suitability has been limited by lack of access to lands that would be affected by the Project. Potential wildlife resources in the study area were evaluated by reviewing existing information and identifying potentially suitable habitat with geographic information system modeling. Sources of information and modeling techniques are summarized in Chapter 10, *Wildlife Resources*, of the RDEIR/SDEIS. The Authority will continue to work with Reclamation, USFWS, NMFS, CDFW, and other regulatory agencies to review these results and discuss the resource protection measures, including avoidance and minimization measures. These efforts have been ongoing for some time for aquatic species with more limited discussion on terrestrial species. The Authority with Reclamation would like to engage in more detailed discussion of these concerns with regard to terrestrial species.

### 3.0 In-River Effects

**Key Concern:** Provide a better demonstration of temperature benefit expected from opportunities to increase storage in Shasta Reservoir.

**Response:** In coordination with Reclamation, text was developed to expand the discussion of fisheries benefits related to increased operational flexibility associated with Shasta Reservoir. This text was developed after issuance of the PAM and was included in Chapter 2, *Project Description and Alternatives*, of the RDEIR/SDEIS. Additional water supply from Sites Reservoir would provide opportunities for improved management of salmonid habitat, particularly in the Sacramento River above Red Bluff Diversion Dam. By exchanging Sites Reservoir water for Central Valley Project (CVP) water, Reclamation has an additional tool to maintain and improve habitat for salmonid spawning,

incubation, rearing, and migration. By delivering water to CVP contractors from Sites Reservoir, Reclamation may maintain supply in Shasta Reservoir. Maintenance of supply can then be allocated in real-time management scenarios to uses that protect and enhance anadromous fish benefits, including protecting and enhancing the cold-water pool, which is essential for temperature control in the salmonid spawning reaches below Keswick Dam during Dry and Critically Dry Water Years. Increased storage may provide benefits beyond temperature such as providing a resource for maintaining fall flows to sustain spawning redds that persist in the wetted margins of the Sacramento River. In years when storm events are weak and naturally-occurring pulse flows are minimal, this maintenance of supply could be used to manufacture a spring pulse flow to assist juvenile salmonids in completing their migration from the upper Sacramento River to the Delta and ultimately the Pacific Ocean. The Authority is working with Reclamation to assess and enhance fisheries benefits associated with Reclamation's participation for the multiple objectives related to increased Shasta Reservoir storage.

The Project would also provide an additional capability to address expected changes in precipitation and runoff patterns anticipated to result from climate change (see Chapter 28 of the RDEIR/SDEIS). While long-term averages in precipitation are not expected to change, more precipitation is expected to fall as rain, resulting in a decreased snowpack and changes in runoff patterns. These changes will likely present challenges for future water management, including that for environmental benefits. The ability of the Project to capture and store water that cannot be captured and stored by Reclamation and to exchange water with Shasta Reservoir creates flexibility to provide environmental benefits to anadromous fish in the upper Sacramento River under climate change scenarios.

**Key Concern:** In general, whenever water diversions occur, there will be an associated loss of food organisms and sediment, incidental mortality of fish at the intake screen(s), and lower survival due to lower flows and related mechanisms (predation exposure, less inundated edge cover, less food production, less suspended sediment). Specific concerns expressed are as follows:

- A. Flow criteria at Wilkins Slough (8,000 cfs [cubic feet per second] in April and May; 5,000 cfs in other months) is likely inadequate to protect downstream migrating salmon. Suggest consideration of Michel et al. (2021).
- B. Need more thorough analysis of effects of habitat reduction on survival. Weighted usable area (WUA) curves do not disclose all effects associated with reduced flow.
- C. Need more complete analysis of effects of flow reductions on sturgeon migration.

**Response:**

- A. Wilkins Slough: In response to the concerns expressed in the PAM and the comments on the RDEIR/SDEIS from CDFW and others, the Authority increased the minimum bypass flow requirement at Wilkins Slough during October to June to 10,700 cfs (303 m<sup>3</sup>/s), which is consistent with the step function identified to in Michel et al. (2021) for increased Chinook salmon survival in the Sacramento River. In summary, Michel et al. (2021) looked at the challenge of implementing functional flows to optimize ecosystem improvements given the limited resources. The minimum bypass flow at Wilkins Slough during September remains at 5,000 cfs. The Project will not be diverting water from June 15 to the end of August. Revisions have been made to the Project diversion criteria. These revisions are reflected in Table 2.

**Table 2. Comparison of RDEIR/SDEIS and Revised Diversion Criteria**

Location (Listed from North to South)	RDEIR/SDEIS with Mitigation Included	Revised and Expected in the Final EIR/EIS
Bend Bridge Pulse Protection	Protection of all qualified precipitation-generated pulse events (i.e., peaks in river flow rather than scheduled operational events) from October to May based on the detection of fish presence and migration during the beginning of the flow event. For each event where fish presence and migration is detected, diversions from the Sacramento River would cease for 7 days.	Similar except the following: (1) a qualified precipitation-generated pulse event is determined based on forecasted flows and (2) pulse protection may cease earlier than 7 days if flows at Bend Bridge exceed 29,000 cfs and Project diversions subtracted from Bend Bridge flows continue to be at least 25,000 cfs
Minimum Bypass Flows in the Sacramento River at the RBPP	3,250 cfs minimum bypass flow at all times; rate of diversion controlled by fish screen design	No change
Minimum Bypass Flows in the Sacramento River at the Hamilton City Pump Station	4,000 cfs minimum bypass flow at all times; rate of diversion controlled by fish screen design	No change
Minimum Bypass Flows in the Sacramento River at Wilkins Slough	10,700 cfs in March through May; 5,000 cfs all other times	10,700 cfs October through June; 5,000 cfs September (not diverting from June 15 to end of August)
Fremont Weir Notch Protections	No more than 1% reduction in flow over weir when spill over the weir are less than 600 cfs. No more than a 10% reduction in flow over weir when spills over the weir are between 600 cfs and 6,000 cfs. No restriction when flows over the weir are greater than 6,000 cfs	No longer included. Revised minimum bypass flows in the Sacramento River at Wilkins Slough and Bend Bridge Pulse Protection provide protections for Fremont Weir Notch
Freeport, Net Delta Outflow Index, X2, and Delta Water Quality	Operations consistent with all applicable laws, regulations, biological opinions and incidental take permits, and court orders in place at the time that diversion occurs	No change

Note: This table mimics Table 2-5 in the RDEIR/SDEIS and the Wilkins Slough flow requirements have been incorporated into the Project Description.

The Authority is working with Reclamation to revise the modeling and determination of effects of the Project’s revised operations criteria on fisheries resources. The Authority is also in ongoing conversations with Reclamation, CDFW, NMFS, and USFWS to develop language to describe how these operational requirements will be implemented and develop the associated fish monitoring program.

- A. Upstream habitat: The Authority agrees diverting flow can have effects on habitat volume and available food that are likely more limiting, and not apparent in WUA calculations. The WUA is derived from the CALSIM runs and as such the WUA’s are based on monthly averages that may not accurately reflect real time operations. The analysis in Chapter 11, *Aquatic Biological Resources*, of the RDEIR/SDEIS considers factors such as temperature, flow, and the effects of flow reductions on side channel and floodplain habitats to support its impact determination of less than significant with mitigation for salmonids.

The Authority will revise the CALSIM analysis with the revised diversion criteria and enhanced anadromous fish benefits to reassess the effects on WUA in the Final EIR/EIS. During 2022, the Authority will work with Reclamation, USFWS, NMFS, and CDFW to review the revised modeling and related analyses to assess the adequacy of the analysis and work toward consensus on impact determinations and any measures needed to reduce impacts to less than significant levels (CEQA) and no adverse effects (NEPA).

- B. Sturgeon: Shaffter (1997) reported spawning on white sturgeon in the Sacramento River at flows of about 6,500 to 6,640 cfs (184 to 188 m<sup>3</sup>/s) after observing pulse of about 1,400 cfs (40 m<sup>3</sup>/s) over base flow conditions. This reference appears to be the source for the concern. The Authority's decision to adopt a higher minimum bypass flow at Wilkins Slough and the Project's pulse flow protection measure would ensure the Project diversion do not cause flows to decline below those likely to influence sturgeon migration and spawning.

**Key Concern:** The relationship between pulses and fish movement is not a precise relationship. Longer and more frequent flows may be necessary to protect downstream-migrating juvenile salmon.

**Response:** The Project's pulse protection measure is intended to account for the importance of pulses in stimulating and providing for the redistribution of juvenile fish from their spawning grounds to downstream rearing areas and seaward migration (Poytress 2014, Steel 2020, Michel 2021, Hassrick 2022). The Authority recognizes that the precise relationship between flow pulses and fish movement is not known at this time. As such, the Authority intends to incorporate the pulse protection criteria, and strategies for evaluating the effectiveness of the criteria, into its adaptive management plan to address this uncertainty and continue to refine the criteria as the science and understanding of fish movement is better understood.

**Key Concern:** Need to address pulses as a mechanism to initiate/attract adult salmon and sturgeon up stream.

**Response:** As presented in the RDEIR/SDEIS, the Project is not expected to impede the upstream migration of adult salmon or sturgeon. The proposed pulse flow criteria ensure pulses are protected and propagate downstream. In addition, the revised minimum bypass flow requirement at Wilkins Slough ensures that Project operations do not diminish flows below levels which may interrupt or delay the upstream migration of sturgeon.

**Key Concern:** Provide a better explanation of effects and benefits of fall pulse flows into Yolo Bypass for plankton production and discussion of consequences of reduced flow into the bypass due to reduction in flows attributable to diversions at TCCA and GCID diversions.

**Response:** An analysis of the expected timing and benefit of the Yolo Bypass flow measure to stimulate food production and convey forage species to the north Delta for the benefit of delta smelt (*Hypomesus transpacificus*) and other planktivorous fish is presented in Chapter 11 - *Aquatic Biological Resources*, of the RDEIR/SDEIS. The benefit of this measure has been acknowledged by CDFW in the review of the Project during the California Water Commission's WSIP approval process. An analysis of the consequences of reduced flow into the Yolo Bypass due to reduction in flows attributable to diversions at TCCA and GCID diversions is provided in the section, *Impact FISH-2: Operations Effects on Winter-Run Chinook Salmon, Floodplain Inundation and Access*, in Chapter 11 - *Aquatic Biological Resources*, of the RDEIR/SDEIS, as well as in Appendix 11M. The analysis concludes that Sites diversions result in minor reductions in Yolo Bypass acreages inundated during the winter and spring, but that when the net effect

of all differences between the NAA and Alternatives 1, 2, and 3 are examined, the differences are small and the effect on fish populations is expected to be minor.

**Key Concern:** Address expected increase in loss of fish at South Delta export facilities associated with July through September increases in Delta exports.

**Response:** The effect of moving Sites Reservoir water across the Delta to the Delta export facilities on the location of X2, flows in Old and Middle River, and expected loss at the export facilities are addressed in Chapter 11 - *Aquatic Biological Resources*, and Appendix 5B3, *Delta Operations*, of the RDEIR/SDEIS. The results of these analyses suggest there would be little difference in south Delta loss between the NAA and Alternatives 1, 2, and 3, primarily due to absence of juvenile ESA-listed fish in the Delta between July and September.

**Key Concern:** More thorough analysis may be needed of the effects of exchanges on spawning and rearing habitat in the American and Feather Rivers.

**Response:** The effects of Project operations on temperatures in the American and Feather Rivers are discussed in Chapter 11, *Aquatic Biological Resources*; Appendix 11B, *Upstream Fisheries Impact Assessment Quantitative Methods*; and Appendix 11D, *Fisheries Water Temperature Assessment*, of the RDEIR/SDEIS. The results indicate impacts from changes in temperatures are less than significant. The effects of Project operations on availability of spawning and rearing habitat in the American and Feather Rivers are also analyzed in Chapter 11 and Appendix 11K, *Weighted Usable Area Analysis*, of the RDEIR/SDEIS. The analysis suggests no significant differences between Alternatives 1, 2, and 3 and the NAA with respect to WUA. An analysis of the potential redd dewatering in the American and Feather Rivers was also conducted and discussed in Chapter 11. The results of that analysis suggested no significant differences among the alternatives and the NAA.

These analyses will be revised to reflect the revised diversion criteria and enhanced anadromous fish benefits in revised CALSIM and other model runs. Once the updated modeling is completed, the Authority will be available to present and discuss those results with Reclamation, USFWS, NMFS, CDFW and the other regulatory agencies.

## 4.0 Cumulative Impacts with Other Projects

**Key Concern:** Reclamation should consider the benefits of these other projects, how they would interact with the Project, and explain the sequence of construction/completion relative to the Project.

**Response:** The Authority understands the interest in exploring how the Project may operate in conjunction with other projects such as the revised Delta Conveyance Project and the Shasta Raise Project. However, these projects are presently not sufficiently developed to assess how they would be constructed and operated, and any analysis of cumulative effects would be speculative. The Authority thinks adding speculative results to the cumulative effects analysis could be misleading; therefore, it does not plan to pursue such an analysis. For additional details, refer to Chapter 31, *Cumulative Impacts*, in the RDEIR/SDEIS. Chapter 31 states “The cumulative analysis is primarily qualitative. The cumulative analysis qualitatively addresses projects listed in Table 31-1, such as Delta Conveyance Project. For many of the projects in Table 31-1 it would be speculative to define multiple parameters and assumptions within a numerical modeling effort.”

## 5.0 References

- Hassrick, J.L., A.J. Ammann, R.W. Perry, S.N. John, and M.E. Daniels, 2022. Factors affecting spatiotemporal variation in survival of endangered winter-run Chinook salmon out-migrating from the Sacramento River. *N. Am. J. of Fish. Man.* <https://doi.org/10.1002/NAFM.10748>
- Michel, C.J., J. Notch, F. Cordoleani, A. Ammann, E. Danner. 2021. Nonlinear survival of imperiled fish informs managed flows in a highly modified river. *Freshwater Ecology*. Available: <https://doi.org/10.1002/ecs2.3498>
- Poytress, W. R., J. J. Gruber, F. D. Carrillo, and S. D. Voss. 2014. *Compendium Report of Red Bluff Diversion Dam Rotary Screw Trap Juvenile Anadromous Fish Production Indices for Years 2002–2012*. Prepared for California Department of Fish and Wildlife Ecosystem Restoration Program and the U.S. Bureau of Reclamation. July. U.S. Fish and Wildlife Service, Red Bluff, CA.
- Schaffter, R. G. 1997. White Sturgeon spawning migrations and location of spawning habitat in the Sacramento River, California. *Calif Fish Game* 83(1):1-20.
- Sites Project Authority. December 2021. Water Storage Investment Program: Sites Reservoir Project Continuing Eligibility and Feasibility Determination. Available: [https://cwc.ca.gov/-/media/CWC-Website/Files/Documents/2021/12\\_December/December2021\\_Item\\_10\\_SitesFeasibility\\_Final.pdf](https://cwc.ca.gov/-/media/CWC-Website/Files/Documents/2021/12_December/December2021_Item_10_SitesFeasibility_Final.pdf)
- Sites Project Authority and Bureau of Reclamation. 2021. Sites Reservoir Project Revised Draft Environmental Impact Report/Supplemental Draft Environmental Impact Statement (RDEIR/SDEIS). November. Available: <https://sitesproject.org/revised-draft-environmental-impact-report-supplemental-draft-environmental-impact-statement/>
- Steel, A.E., Anderson, J.J., Mulvey, B., & Smith, D.L. (2020). Applying the mean free-path length model to juvenile Chinook salmon migrating in the Sacramento River, California. *Environmental Biology of Fishes*, 103, 1603-1617. <https://doi.org/10.1007/s10641-020-01046-8>

# Maxwell Intertie Project

Status of the Project and  
Relationship with Sites Reservoir Project

August XX, 2022



# Meeting Agenda

- Introductions
- Maxwell Intertie Project
  - Status of Environmental Compliance
- Sites Reservoir Project
  - Project Description
  - Relationship to Intertie
  - Status of Environmental Compliance
- Next Steps

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Speaker: Ali

# Maxwell Intertie Project

- The Sites Project Authority (Authority) applied for a USDA Rural Development Community Facilities direct loan to assist in the financing of the construction of the Maxwell Water Intertie (MWI) facilities.
- The proposed MWI facilities would connect the existing Tehama Colusa Canal (TC Canal) and the existing Glenn Colusa Irrigation District's (GCID) main canal.
- Project would increase water management flexibility and improve water supply resiliency for participants during dry years. It would also increase the efficiency and reliability of water management in the western Sacramento Valley.

Speaker: Ali

# Maxwell Intertie Project Facilities

- Proposed facilities as described in 2018 include:
  - A 1,200-acre-foot capacity Terminal Regulating Reservoir (TRR) covering 130 acres with a spillway to the local irrigation ditch system and bottom drain, both of which ultimately connect to Funks Creek.
  - A TRR Pumping Plant with a 900-cfs maximum pumping capacity, a 1-acre electrical switchyard adjacent to the plant, and a 3.5-mile power line.
  - A GCID Main Canal Connection to TRR including a gated inlet control structure, short inlet channel, and concrete canal lining in the GCID Main Canal immediately upstream and downstream of the TRR connection.
  - A 3.5-mile MWI pipeline sized for 900 cubic feet per second (cfs) pumped capacity and 900 cfs gravity flow capacity, private access bridge over the GCID Main Canal for construction access and maintenance of the pipelines, and a 2.7-mile gravel access road that would run most of the length of the MWI pipeline alignment.

Speaker: Ali

# Status of Environmental Compliance

- NEPA Environmental Assessment (EA)
  - Environmental report prepared by the Authority and its consultant, USDA concurred with its scope and content and issued it as the Agency's Environmental Assessment (EA) for the proposed Project in August 2018.
  - Final EA September 2018
  - FONSI dated September 24, 2018
- ESA Section 7
  - Consultation August-September 2018
  - Expedited Biological Opinion issued in 2018
- Section 106
  - Nationwide Programmatic Agreement (NPA)
  - USDA 8/17/2018 notice to SHPO
    - intent to use the USDA RD NPA for the Maxwell Intertie project
    - "Once we have determined the final Area of Potential Effect (APE) RHS and the Authority will initiate a section 106 review and provide you with a complete project description and a description of the APE"
  - NPA Applicant Awareness Certification signed by the Authority

## EA Mitigation

Land Use  
Geology and Paleontological Resources  
Air Quality and Climate Variability  
Water Resources  
Biological Resources

- Wildlife and Special-Status Species
- Vegetation and Special-Status Species
- Wetlands

Aesthetics and Visual Resources

# Maxwell Intertie Funding Commitments

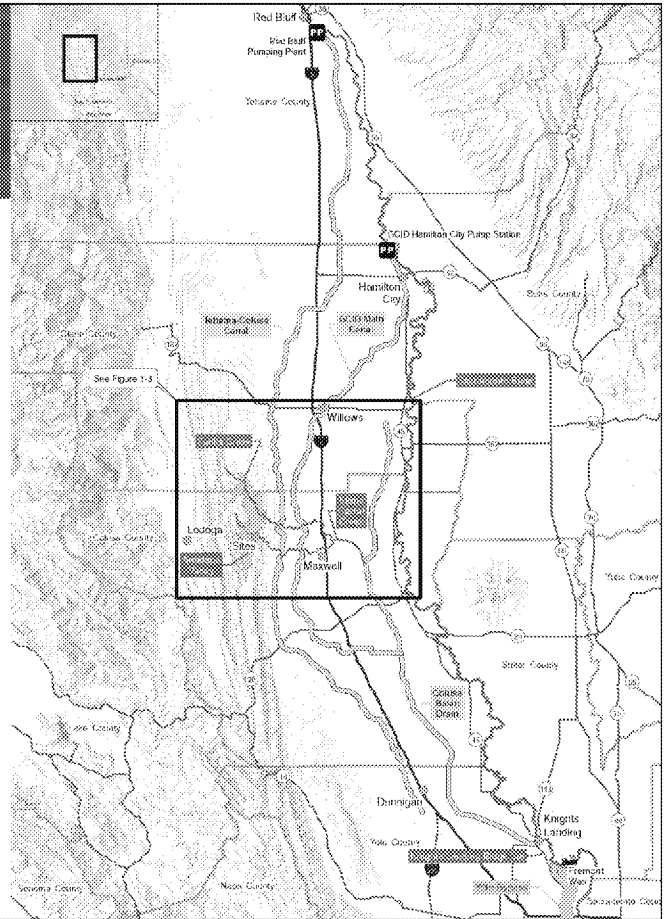
- USDA's action consisted of the conditional approval of the Community Facilities direct loan
  - not a final project approval
  - requires all conditions outlined by USDA to be fulfilled before the closure of the loan and the loan funds are dispersed
- Requires completion of
  - additional technical analyses,
  - additional details on financing and participation
  - all environmental reviews and permits

Speaker: Ali

# Sites Reservoir

- Proposed off-stream reservoir west of Maxwell, CA
- Divert water from the Sacramento River in higher flow conditions
- Store water in the new Sites Reservoir for later use by farms, cities, and the environment
- Sites Reservoir Authority would build, own, and operate Sites Reservoir
- Funded by State and Federal governments and public water agencies
- A key tool to help the state restore flexibility, reliability, and resilience to our statewide water supply

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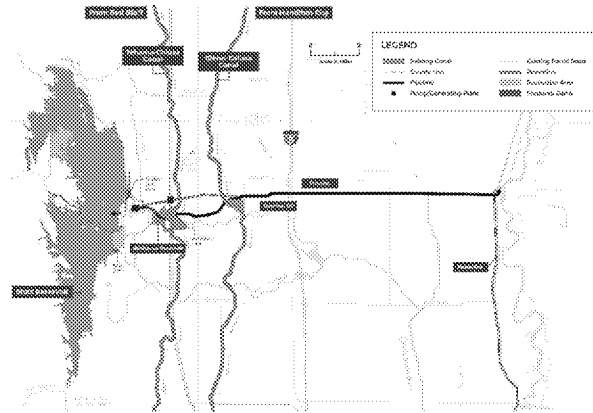


Speaker: Laurie

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# Sites Reservoir Project

- 2017 Project
  - 1.8 million acre-foot reservoir
  - 3 intakes (about 6,000 cfs diversion capacity in total)
  - New Delevan Pipeline and intake
  - Pump/generation facility
  - Draft EIR/EIS August 2017
- 2019/20 Project modifications
  - Facilities and footprint
  - Operations
  - Conveyance
  - Release to Colusa Basin Drain



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Speaker: Laurie

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# Alternatives Considered in the 2021 Revised Draft EIR/Supplemental Draft EIS

Facilities / Operations	Alternative 1 – Authority's Preferred Project	Alternative 2	Alternative 3
Reservoir Size	1.5 MAF	1.3 MAF	1.5 MAF
Hydropower	Incidental upon release	Same as Alt 1	Same as Alt 1
Diversion Locations	Red Bluff Pumping Plant and Hamilton City	Same as Alt 1	Same as Alt 1
Conveyance Release / Dunnigan Release	1,000 cubic feet per second (cfs) into new Dunnigan Pipeline to Colusa Basin Drain	1,000 cfs into new Dunnigan Pipeline to Sacramento River. Partial release into the Colusa Basin Drain	Same as Alt 2
Terminal Regulating Reservoir (TRR)	Construction of TRR PGP and TRR pipelines; TRR East location	Construction of TRR PGP and TRR pipelines; TRR West location	Same as Alt 1
Reclamation Involvement	1. Funding Partner 2. Operational Exchanges a. Within Year Exchanges b. Real-time Exchanges	Operational Exchanges a. Within Year Exchanges b. Real-time Exchanges	Same as Alt 1, but up to 25% investment
Route to West Side of Reservoir	Bridge across reservoir	Paved road around southern end of reservoir	Same as Alt 1

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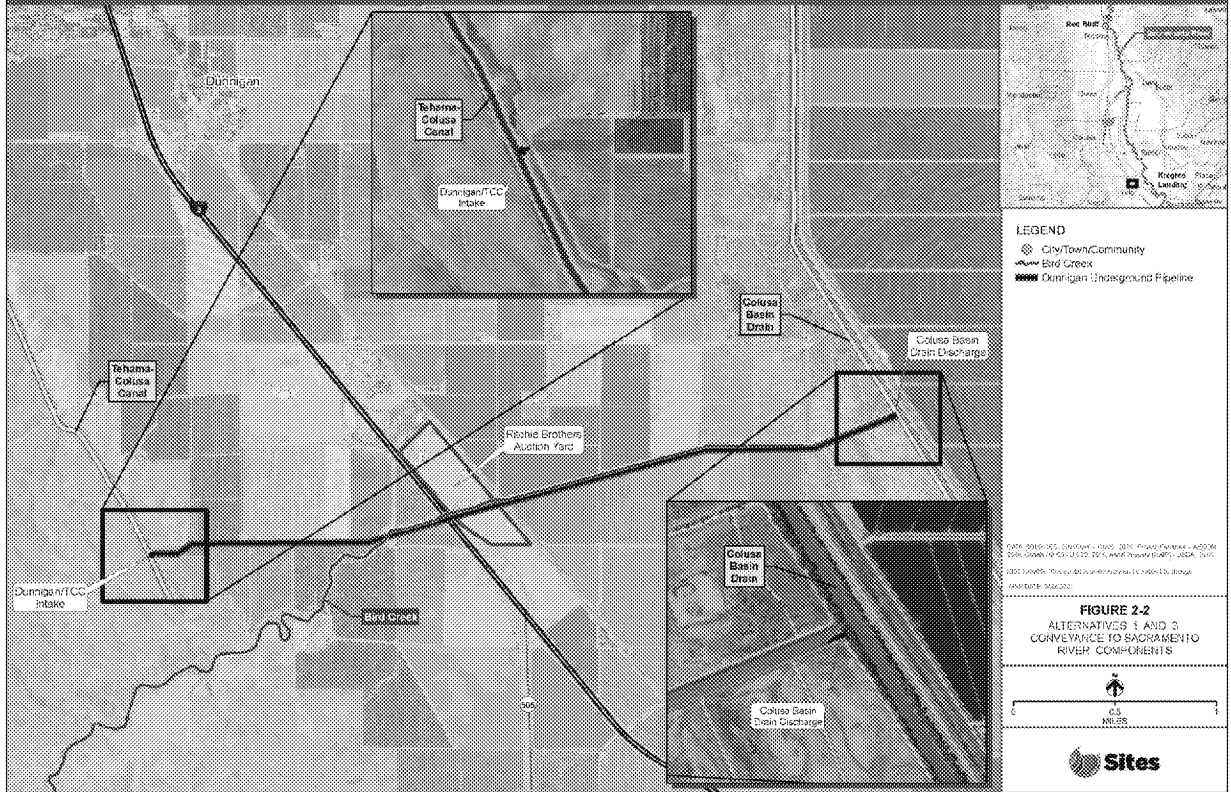
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Speaker: Laurie

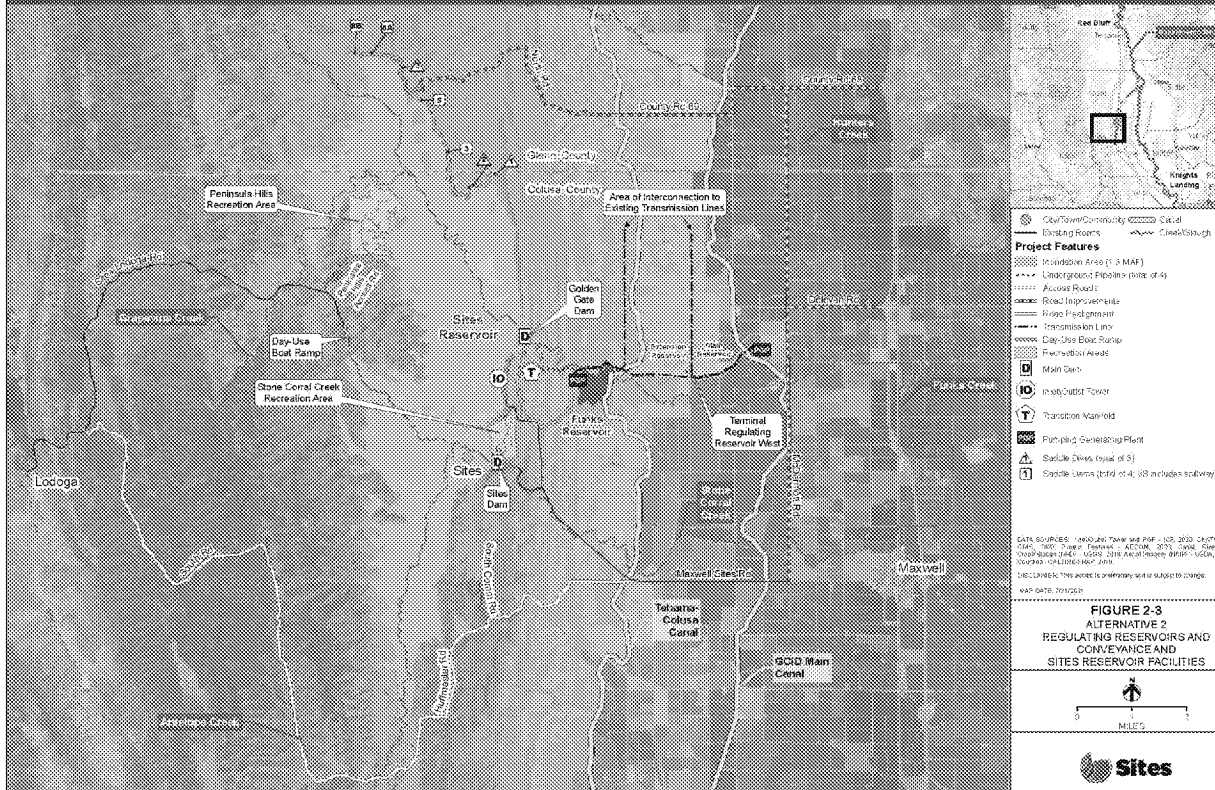
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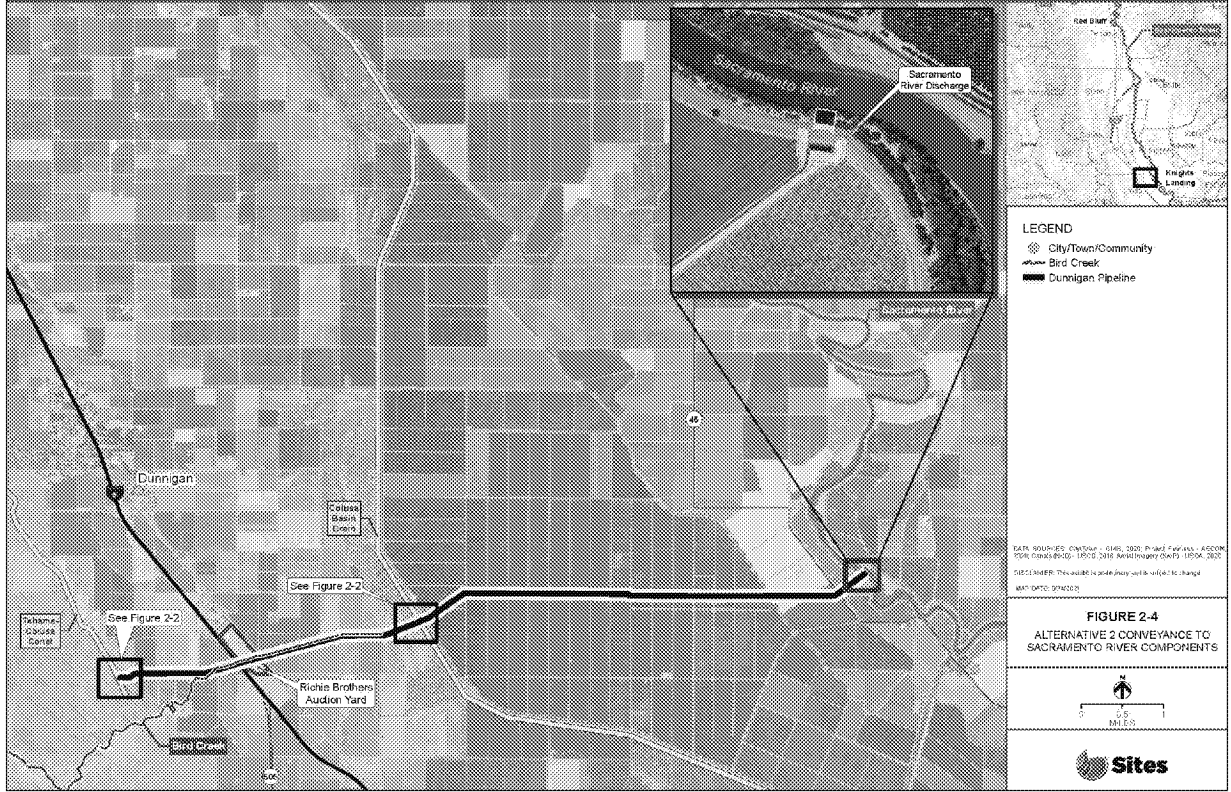
# Alternative 1 and 3 Facilities (cont)



# Alternative 2 Facilities



# Alternative 2 Facilities (cont)



# Sites - Status of Environmental Compliance

- CEQA/NEPA

- Revised Draft EIR/Supplemental Draft EIS circulated for public review and comment November 12, 2021
- Comment period closed January 28, 2022
- Final EIR/EIS to be completed early 2023

- ESA Section 7

- Draft BAs under review

- Section 106

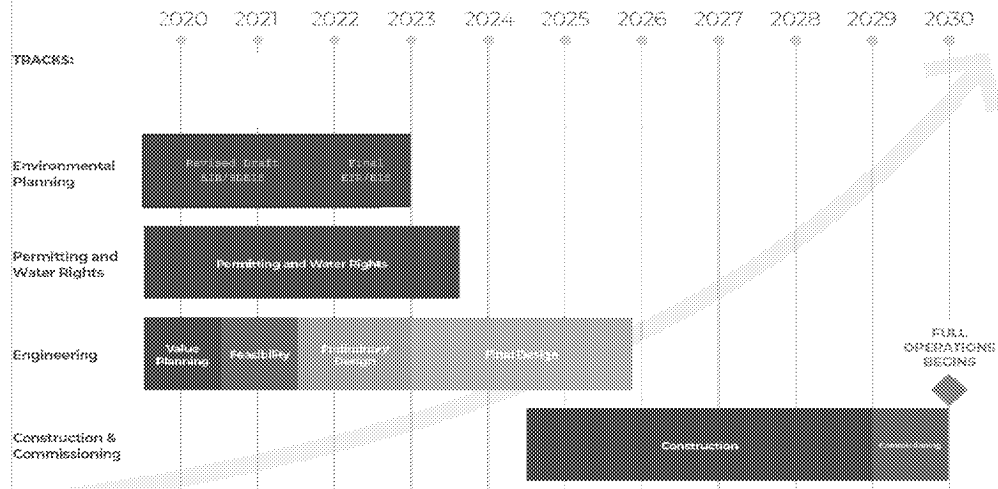
- Draft Programmatic Agreement under review

## EIR/EIS Mitigation

Agricultural Resources  
Geology and Paleontological Resources  
Air Quality  
Greenhouse Gases  
Water Quality  
Biological Resources  
- Wildlife and Special-Status Species  
- Vegetation and Wetlands  
- Aquatic Species  
Cultural Resources  
Tribal Cultural Resources

# Project Schedule

## Sites Reservoir Project Schedule



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# Relationship Between Sites and the Maxwell Intertie

- Common Components and Purpose
  - Both would connect the existing Tehama Colusa Canal (TC Canal) and the existing Glenn Colusa Irrigation District's (GCID) main canal
  - Components include:
    - Construction and operation of the of Terminal Regulating Reservoir (TRR), either at the TRR East or TRR west location
    - Construction of the TRR Pumping Generating Plant (PGP )and TRR pipelines

# Relationship Between Sites and the Maxwell Intertie

- Independent Utility
  - MWI can operate independently of the overall Sites Project. If the Sites Project is not built, the MWI can still be constructed and operated to provide critical water management and reliability benefits to the western Sacramento Valley.
- Maximized Benefits
  - If MWI is developed and operated in conjunction with the overall Sites Reservoir Project, the project's benefits would greatly expand the efficiency, resiliency and reliability of water management throughout California, including important benefits to rural communities throughout the state.

Speaker: Laurie

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# Next Steps

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# Questions



