Sites Reservoir

Sites

Our Strength is in Our Broad Statewide Participation

Sacramento Valley
City of American Canyon
Colusa County
Colusa County Water Agency
Cortina Water District
Davis Water District
Dunnigan Water District
Glenn County
Glenn-Colusa Irrigation District
LaGrande Water District
Placer County Water Agency
Reclamation District 108
City of Roseville
Sacramento County Water Agency
City of Sacramento
Tehama-Colusa Canal Authority
Westside Water District
Western Canal Water District

Bay Area
Santa Clara Valley Water District
Zone 7 Water Agency

San Joaquin Valley
Wheeler Ridge-Maricopa Water Storage District
Rosedale-Rio Bravo Water Storage District

Southern California
Antelope Valley - East Kern Water Agency
Coachella Valley Water District
Desert Water Agency
Irvine Ranch Water District
Metropolitan Water District
San Bernardino Valley Municipal Water District
San Gorgonio Pass Water Agency
Santa Clarita Valley Water Agency

Waiting List-
Cal-Am Sacramento
City of Napa
Delta View WUA
Glenn County
La Cumbre MWC
Madera County
Pacific Resources MWC
Palmdale Water District
Santa Clara Valley WD
Westlands WD
Wheeler Ridge Maricopa WSD
Woodland Davis CWA

Sites

Affordable, Permittable, Buildable

Sites underwent a rigorous value planning effort that resulted in a "right-sized" project. The Sites Reservoir of today:

- Has a smaller footprint than the previous iteration
- Meets the water supply needs of current participants
- Comes at a lower cost
- Supports State's environmental goals
- Creates flexibility for participants
- Performs under most challenging climate change scenarios

The right-sized project cuts roughly $2 billion from the original proposal.

Sites is now more affordable, permittable, and buildable.

Sites

Provides Climate Change Resiliency

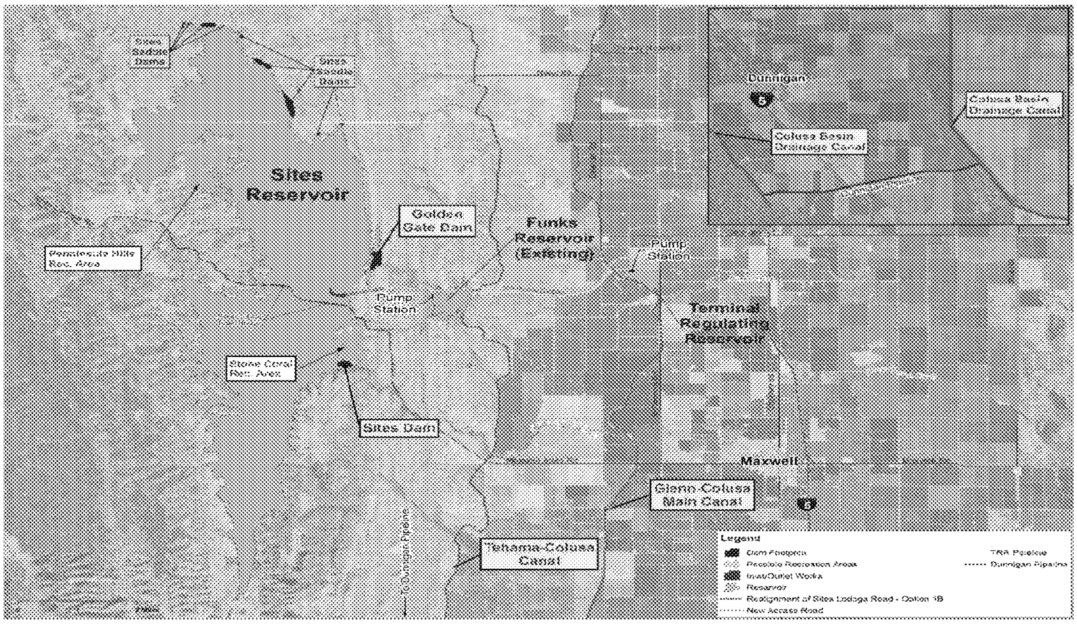
How does Sites Reservoir address these challenges?

- Captures excess flows from Sacramento River – rain instead of snowmelt
- Off-river storage increases environmental benefits by not damming major river system
- Adds 1.5 million acre-feet of water into the statewide system, easing pressure on other sources during droughts
- Supplies water for people, farms and environment during the longer dry spells California experiences
- Allows other reservoirs, like Shasta, Oroville and Folsom to conserve more cold water during dry periods in order to benefit fisheries

Project performance is expected to improve by approximately 5%-10% under anticipated climate change conditions

Sites

Affordable, Permittable, Buildable



Provides a Resilient, New Supply of Dry Year Water

SITES PROJECT NEW WATER SUPPLY

Year Type	Water Supply (thousand acre-feet)*
Wet	80-120
Above Normal	130-390
Below Normal	170-330
Dry	375-440
Critically Dry	265-315
Long-Term Average	208-280

*Ranges depict differences in selected project alternative and hydrology

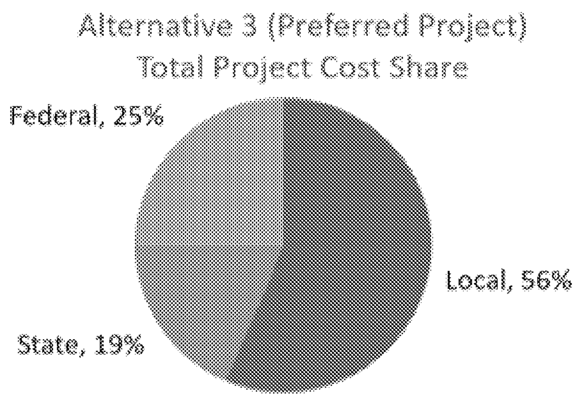
One thousand acre-feet of water supply can serve about 2,000-3,000 households for one year, or 200-500 acres of productive California agriculture.

Sites

EIR Project Alternatives

Facilities / Operations	Alternative 1	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 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%*** storage allocation
DWR Involvement	Operational Exchanges with Oroville and use of SWP facilities South-of-Delta	Same as Alt 1	Same as Alt 1
Route to West Side of Reservoir	Bridge across reservoir	Paved road around southern end of reservoir	Same as Alt 1

Sites is a Local Led Project with Federal and State Investment



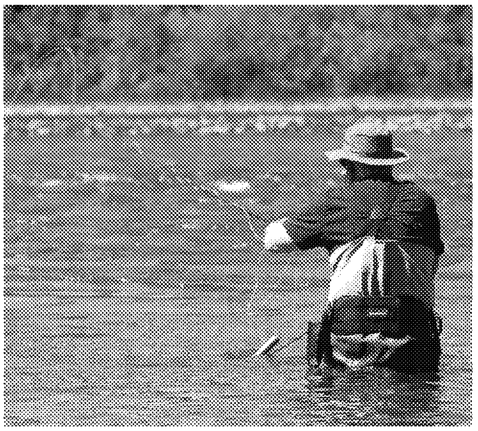
State Investment Provides Badly Needed Environmental Benefits

Sites Reservoir provides water dedicated to environmental use

Between 20%-40% of the **Sites Reservoir Project's annual water supplies will be dedicated to environment uses:**

- **Preserve cold-water** pool for later use during dry years in summer months to support **salmon development, spawning and rearing**
- Provide a **reliable supply of refuge water** to improve **Pacific Flyway** habitat for **migratory birds** and other **native species**
- Improve **water flows in the Delta** to help improve conditions for the **Delta Smelt**

Water and Storage Space dedicated for the environment - Sites Reservoir creates a water asset for the state that **does not currently exist.**



Sites

Environmental & Regulatory Considerations

- **Water Rights Protections** – Withdrawing from the River only during excess conditions, when **all senior water rights and Delta flows/water quality conditions are met**
- **Multi Barrier Intake Protections** – Limited withdrawal periods, diverting while certain **bypass flow conditions exist**, River pulse protections, all diversions through **state-of-the-art fish screens**
- **Water Quality and Delta Flows Protected** – **Returning additional water** to the River/Delta during dry periods of dry years, water quality continuously monitored
- **Future Water Availability Analyzed** – **Evaluated 3 scenarios** under differing scenarios; all find sufficient water being available in all year types
- **Terrestrial Effects Fully Mitigated** – Project relying heavily on **existing infrastructure, limiting construction impacts**, opportunities for environmental enhancements with mitigation

Sites

The project is mostly a large earthwork project because of the heavy dependence on existing pumping and conveyance features

Serving California's environment, families, and farms takes:

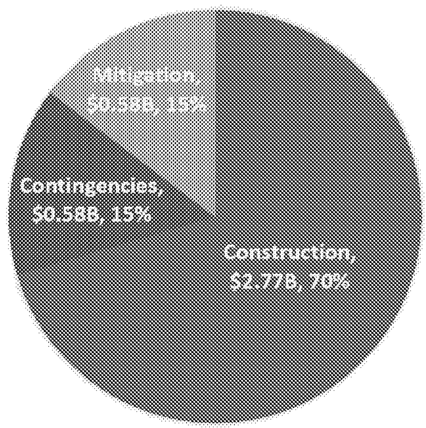
1.5 million acre-ft of storage

2 new large dams and several smaller saddle dams

11 miles of big pipes (9-12ft)

20 million cubic yards of fill

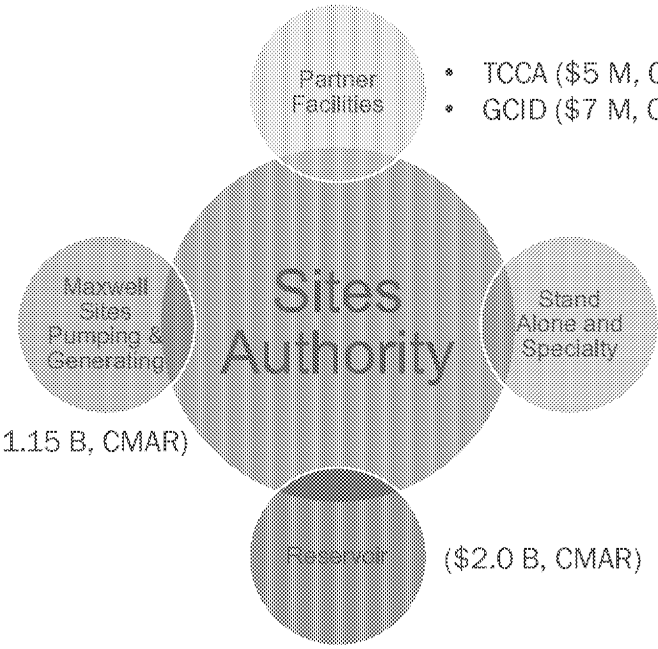
ESTIMATED PROJECT COSTS
($3.9B, 2021$)



Estimated construction costs are based on the class 4 cost estimate for alternative 1 approved by the Reservoir Committee and Authority Board in June 2021

Sites

Summary of the Authority's Current Contracting Strategy adopted July 2022 (costs in 2021$)



- TCCA ($5 M, Owner Agreements)
- GCID ($7 M, Owner Agreements)

- Dunnigan Pipeline ($100 M, DBB)
- Huffmaster Road ($50 M, DBB)
- Reservoir Clearing ($35 M, DBB)
- Mitigation ($600 M, various)
- Recreation ($35 M, DBB or DBO)

($1.15 B, CMAR)

($2.0 B, CMAR)

Project Costs and Affordability

Reservoir Size (MAF)	Alternative 3 (1.5MAF)
Total Project Cost (2021$, billions)	$3.93
Annualized AF/year release (AFY)	250,000
Range of Annual Costs During Repayment With WIFIA Loans (2021$, $/AF)	~$760

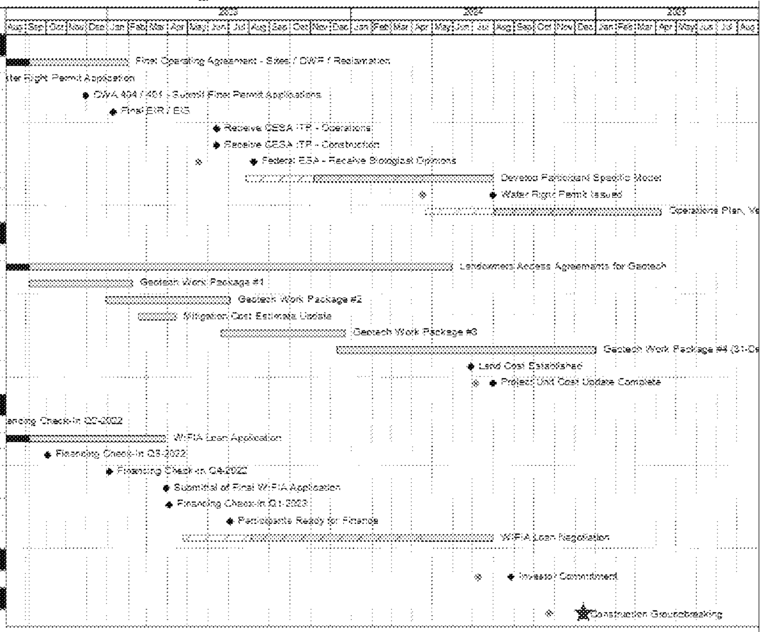
F.O.B Origin

Sites

Looking Ahead

Sites Reservoir Project Schedule

#	Activity Name	Start	Finish
1	**What do we get?**	19-Apr-22 A	08-Apr-25
2	Final Operating Agreement - Sites / DWR / Reclamation	19-Apr-22 A	30-Jan-23
3	Submit Water Right Permit Application		11-May-22 A
4	CWA 404 / 401 - Submit Final Permit Applications		29-Nov-22
5	Final EIR / EIS		09-Jan-23
6	Receive CESA ITP - Operations		13-Jun-23
7	Receive CESA ITP - Construction		13-Jun-23
8	Federal ESA - Receive Biological Opinions		07-Aug-23
9	Develop Participant Specific Model	08-Nov-22	30-Jul-24
10	Water Right Permit Issued		30-Jul-24
11	Operations Plan, Version 2	02-Aug-24	08-Apr-25
12	**What does it cost?**	03-Jan-22 A	31-Dec-24
13	Geotech EA/IS	03-Jan-22 A	29-Jul-22 A
14	Landowners Access Agreements for Geotech	22-Mar-22 A	30-May-24
15	Geotech Work Package #1	05-Sep-22	06-Feb-23
16	Geotech Work Package #2	30-Dec-22	03-Jul-23
17	Mitigation Cost Estimate Update	16-Feb-23	12-Apr-23
18	Geotech Work Package #3	20-Jun-23	22-Dec-23
19	Geotech Work Package #4 (31-Dec-24)	11-Dec-23	31-Dec-24
20	Land Cost Established		27-Jun-24
21	Project Unit Cost Update Complete		30-Jul-24
22	**How do we pay?**	01-Jul-22 A	30-Jul-24
23	Financing Check-in Q2-2022		01-Jul-22 A
24	WIFIA Loan Application	06-Jul-22 A	28-Mar-23
25	Financing Check-in Q3-2022		03-Oct-22
26	Financing Check-in Q4-2022		03-Jan-23
27	Submittal of Final WIFIA Application		28-Mar-23
28	Financing Check-in Q1-2023		03-Apr-23
29	Participants Ready for Finance		03-Jul-23
30	WIFIA Loan Negotiation	04-Aug-23	30-Jul-24
31	**Investor Commitment**	27-Aug-24	27-Aug-24
32	Investor Commitment		27-Aug-24*
33	**Construction**	11-Dec-24	11-Dec-24
34	Construction Groundbreaking	11-Dec-24	



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Data Date: 05-Sep-22 / Print Date: 12-Sep-22

Creating an Affordable, Permittable & Buildable Project

Goals for 2022 - 2024

- Secure Final Prop 1 Funding award with CWC
- Execute Final Operations Agreement
- Secure WIIN and BIL Federal Funding
- Complete WIFIA/USDA Loan Agreements
- Execute Benefits and Obligations Contracts
- Complete Final EIR/EIS
- Obtain Critical Environmental Permits (BO, ITP, 404)
- Receive Water Right Order and Permit
- Obtain Local Agency Agreements and Permits
- Execute Benefits Contracts with DWR and CDFW

Sites

Creating an Affordable, Permittable & Buildable Project

Goals for 2022 - 2024

- Develop Mitigation Acquisition Master Plan
- Initiate Application for DSOD Permit to Construct
- Advance Engineering Design to achieve Level 3 cost estimate
- Determine Procurement and Delivery Strategy
- Determine Overall Project Schedule
- Develop and Implement Land Acquisition Master Plan
- Conduct Geotech Investigations and Evaluations
- Perform Geotech Evaluation of all "Willing Seller" Properties
- Determine Organization Structure and Governance

Sites

INFO@SITESPROJECT.ORG

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Sites

From: Spranza, John [John.Spranza@hdrinc.com]
Sent: 1/4/2023 8:30:25 AM
To: Stephen Maurano - NOAA Federal [stephen.maurano@noaa.gov]; Hunt, Shane D [shunt@usbr.gov]; Dekar, Melissa D [mdekar@usbr.gov]; ajacobson@usbr.gov
CC: Alicia Forsythe [aforsythe@sitesproject.org]; Millsap, Stephanie D [stephanie_millsap@fws.gov]; brittany_reaves@fws.gov; steven_schoenberg@fws.gov; garwin.yip@noaa.gov; dbrick@usbr.gov; Cathy Marcinkevage [cathy.marcinkevage@noaa.gov]; Barbara Byrne [barbara.byrne@noaa.gov]; Naseem Alston [naseem.alston@noaa.gov]
Subject: RE: Spranza, John shared the folder "2022-Nov_Admin_Draft_BA" with you.
Attachments: SITES_draftBA_NMFScomments_1_3_2023 (002).xlsx

Thank you Stephen. For tracking purposes we have created the attached spreadsheet.

John Spranza

D 916.679.8858 M 818.640.2487

From: Stephen Maurano - NOAA Federal <stephen.maurano@noaa.gov>
Sent: Thursday, December 29, 2022 11:59 AM
To: Hunt, Shane D <shunt@usbr.gov>; Dekar, Melissa D <mdekar@usbr.gov>; ajacobson@usbr.gov
Cc: Alicia Forsythe <aforsythe@sitesproject.org>; Millsap, Stephanie D <stephanie_millsap@fws.gov>; brittany_reaves@fws.gov; steven_schoenberg@fws.gov; garwin.yip@noaa.gov; dbrick@usbr.gov; Cathy Marcinkevage <cathy.marcinkevage@noaa.gov>; Barbara Byrne <barbara.byrne@noaa.gov>; Naseem Alston <naseem.alston@noaa.gov>; Spranza, John <john.spranza@hdrinc.com>
Subject: Re: Spranza, John shared the folder "2022-Nov_Admin_Draft_BA" with you.

Good Morning,

Thank you for the opportunity to review the draft Sites Reservoir Biological Assessment. We understand that Reclamation requested a high level review and identification of some of the items needing further discussion, and would like to highlight the topics below. The topics are organized by Project Description, Diversion Criteria, Impacts to the Big Notch Project, and Surface Water Quality. We'd be happy to discuss further with Reclamation and coordinate discussions with the Sites Project Authority as appropriate.

Best,

- Stephen

Project Description

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- **Consultation Approach**
- NMFS noted the consultation approach proposed in the draft BA by Reclamation and looks forward

- to discussing the appropriate path forward for this consultation given its connection to other ongoing CVP actions. Additional details regarding the coordinated operations agreement between Sites and the CVP/SWP may also be necessary in order to provide sufficient
- information to determine the effects of the proposed action.
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- **Lifecycle Model**
- NMFS is interested to review the results of the Winter-run Chinook salmon Lifecycle Model,
- discuss their interpretation, and see them integrated into the biological assessment effects analysis.
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Diversion Criteria

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- **Refining Pulse Protection and Bypass Flows**
- NMFS made suggestions to the Sites Project Authority in meetings earlier this year (1/26/22
- and 1/31/22) as well as comments under NEPA to help further refine the diversion criteria for project operations. NMFS would welcome a discussion with Reclamation to explain the rationale underlying these suggestions, some of which are summarized below, for
- Bend Bridge Pulse Protection, Minimum Bypass Flows at Red Bluff Pumping Plant, Hamilton City Pump Station, and Wilkins Slough.
- NMFS would appreciate hearing from Reclamation about the rationale behind the proposed criteria which may offer limited
- protections.
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-
- **Bend Bridge**
- The requirement that there be a simultaneously detected pulse of fish, mainstem flows, and
- tributary flows, adds complexity and contingencies to the Bend Bridge Pulse Protection potentially limiting its effectiveness. Moreover, the protection may be belated by several days, since the triggering flows are measured as three-day trailing averages,
- and the triggering fish passage monitoring will require time to process that data, communicate it to the operators and adjust diversions accordingly. In order to be effective, NMFS has suggested that the protection be scheduled based on forecasted river flows
- to avoid harm to fish pulses during the ascending limb of the hydrograph. If no fish are detected after a number of days, then the protection can be truncated. NMFS would also suggest that protection should also not contingent on increases in tributary inflows
- since there's recent experience that indicates fish can be mobilized downstream by mainstem Sacramento operational pulse events that are not precipitation generated (e.g. the October 2019 dry weather pulse releases for rice decomposition from Keswick that
- caused a contemporaneous increase in winter run chinook passage). Similarly, the complicated requirements for when another pulse event can be triggered (based on flows at Bend Bridge, Cow Creek, Cottonwood Creek, and Battle Creek) should be simplified to a
- relevant biological metric (e.g. when the pulse of fish passage has subsided). NMFS is not aware of how these flow triggers on the tributaries were derived, and in the absence of that information, they seem unsubstantiated. In summary, and as noted previously

- in comments on the EIS, a protective Bend Bridge Pulse Protection could be especially important for earlier migrants in the first pulse after a relatively drier period, as well as for later migrants facing small windows when downstream and Delta conditions
- are suitable. Protecting life history diversity, especially in outmigration timing, is key to salmonid population viability.
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- **Red Bluff and Hamilton City**
- The Minimum Bypass Flows in the Sacramento River at the RBPP and Hamilton City Pump Station

need further refinement. Modeling from reports referenced in the draft BA indicates risk of stranding at low flows in the Sacramento River below Keswick Dam concluding that "…substantial juvenile stranding could be avoided by keeping flows above 3,750 cfs."
- Considering that average flows in the Sacramento River can be approximately 2,000 cfs higher at Red Bluff Diversion Dam compared to Keswick Dam, the proposed 3,250 cfs bypass target could result in substantial stranding of juvenile chinook salmon. Moreover,
- in the December through February timeframe, flows may need to be substantially higher to reduce Fall-Run redd dewatering and ensure consistency with CVP LTO Keswick Fall Base Flows. The minimum bypass flows at Hamilton City should also be adjusted correspondingly.
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- **Wilkins Slough**
- The Minimum Bypass Flows in the Sacramento River at Wilkins Slough drop from 10,700 cfs
- during much of the year to 5,000 cfs in September. However, there can be substantial juvenile Winter-run Chinook Salmon passage at RBDD during September (e.g. 2009, 2019 and 2020). NMFS would like to discuss the protection of rearing and outmigration during
- this period.
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Impacts to the Big Notch Project

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- **Big Notch**
- NMFS appreciates the commitment from Reclamation to avoid any adverse impacts from Sites
- Reservoir to the Big Notch Project with the draft BA stating, "The [Sites] Project will operate to preclude any adverse effects to the Big Notch Project's ability to achieve the same level of performance for salmonids in the Sacramento River as it would absent
- the Project." However, the NMFS has been informed that the final EIR/SEIR intends to remove the previously proposed Fremont Weir Notch Protections and no protections were listed in the draft BA. Initial modeling based on 2009-2012 hydrology shows Sites negatively
- impacting Big Notch in all water year types - including a 24% cumulative Big Notch flow reduction in the dry year (2009) of the analysis. NMFS would appreciate further discussions with Reclamation regarding the operational changes needed to mitigate these
- impacts.

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Surface Water Quality

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• **Mercury**

• Mercury impacts on aquatic life should be further analyzed in the effects analysis, especially for sturgeon which have

• been reported to have higher levels of mercury in tissues, and specifically for the Green Sturgeon sDPS in California's Central Valley for which mercury was part of the cause of species listing.

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• **Temperature**

• The Water Temperature Index Value Analysis obscures temperature impacts of the project. In particular, the biologically meaningful criteria are too narrow in their definition: requiring both a 5% difference in days/month and 0.5 F change. For example, temperatures

• could exceed the targets by 10°F for a single day or increase temperatures by 0.25°F for the entire spawning season. Raising temperatures could result in lethality for salmonids, if that temperature crosses the physiological threshold for the species.

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• **Colusa Basin Drain (CBD) and Yolo Bypass**

• The proposed monitoring of water quality impacts to Yolo Bypass is sparse and there's a

• substantial amount of river miles between Wallace Wier to Lisbon Wier and downstream to the Cache Slough complex - with variable intervening habitat, land use, and hydrology. The mitigation measure (to reduce flows when the temperatures are too high and dissolved

• oxygen is too low) seems counterintuitive since it will potentially increase residence time and reduce reaeration. The monitoring strategy proposed may also not be effective if, for example, the causes of hypoxia are nitrogen and phosphorus loadings from the

• CBD into the bypass during the winter, but those don't drive eutrophication until the summer. Similarly, loadings of mercury may methylate under certain conditions, and, along with pesticides and herbicides, accumulate in fish tissues or sediments - so that

• they're not adequately detected in the proposed water column monitoring. For mitigation measures FISH-8.1 and WQ-2.2 a more effective approach may be to develop a water quality model for the relevant parameters (metals, nutrients, Hg, Se, temperature, DO,

• etc.) for the receiving waters of interest (CBD and Yolo Bypass).

• A hydrodynamic water quality model would allow forecasting of water quality impacts of Sites

• Reservoir to determine the fate and transport of pollutants and prioritize locations to mitigate pollutant loadings.

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• **Reservoir Water Quality**

• Likewise, applying a water quality model for the proposed reservoir to anticipate trophic status and risk of mercury methylation should be considered.

- The use of CALSIM monthly data (for metals, pesticides, salinity, HABs) lacks the temporal resolution to analyze acute
- water quality exceedances. The CE-QUAL-W2 model being used for temperature analysis in Sites could be further developed to analyze the other potential water quality impacts in reservoir: namely metals, including mercury, salinity, and especially eutrophication
- and HABs.
-

On Wed, Nov 2, 2022 at 10:42 AM Spranza, John <John.Spranza@hdrinc.com> wrote:

Spranza, John shared a folder with you

Hello,
This shared file contains the Sites Project's administrative draft BA. The Authority would appreciate your technical assistance with the further preparation of the document by providing comments and feedback on this draft and identifying any concerns or areas that need additional revision.

Your help is much appreciated, please let me know if you have any questions or if you are having trouble accessing this folder.
Regards,
John

2022-Nov_Admin_Draft_BA

This link only works for the direct recipients of this message.

Open

--
Stephen Maurano (he/him/his)
California Central Valley Office | NOAA Fisheries
(916) 214-2675

www.fisheries.noaa.gov

NOAA FISHERIES

File Provided Natively

From: Laurie Warner Herson [laurie.warner.herson@phenixenv.com]
Sent: 1/4/2023 10:19:34 AM
To: Alicia Forsythe [aforsythe@sitesproject.org]; Spranza, John [john.spranza@hdrinc.com]; Risse, Danielle [Danielle.Risse@hdrinc.com]; Edwards, Dawn [Dawn.Edwards@hdrinc.com]
Subject: RE: Sites - Schedule Discussion
Attachments: Non-Bio and Cultural Mitigation Implementation Timing.xlsx; Caltrans Revalidation.docx; CPUC variance form.pdf; CPUC variance.pdf

The attached excel spreadsheet was sent to some of you earlier – it's the non-bio/cultural mitigation that needs to be implemented prior to construction. There is also a list of BMPs in appendix 2D that needs to be made part of the bid package(s).

I've attached samples of forms used by other agencies to document minor changes to a project during construction. I'm assuming the contractor will bring on an environmental firm to monitor construction and would need to have standardized forms and procedures that the Authority would review. This process (reviewing the construction plans for compliance with the EIR/EIS) will need to be accommodated in the schedule eventually.

-----Original Appointment-----
From: Alicia Forsythe <aforsythe@sitesproject.org>
Sent: Thursday, December 15, 2022 4:13 PM
To: Alicia Forsythe; Spranza, John; Laurie Warner Herson; Risse, Danielle; Edwards, Dawn
Subject: Sites - Schedule Discussion
When: Wednesday, January 4, 2023 12:00 PM-3:00 PM (UTC-08:00) Pacific Time (US & Canada).
Where: Microsoft Teams Meeting

Please add others as you see fit.

Lets review our MS Project schedule
Review Dams and Conveyance schedule and decide where to insert environmental lines
Other items
Next steps

Microsoft Teams meeting

Join on your computer, mobile app or room device
Click here to join the meeting

Meeting ID: 257 423 685 801
Passcode: 7Naq65
Download Teams | Join on the web

Or call in (audio only)
+1 916-538-7066,,249956727# United States, Sacramento
Phone Conference ID: 249 956 727#
Find a local number | Reset PIN

Learn More | Meeting options

File Provided Natively

Community Working Group Outline: Purpose and Structure

Purpose

The Sites Reservoir Community Working Group (CWG) will provide a forum for representatives of local community agencies, associations, businesses, and civic organizations to work collaboratively with the Sites Project Authority to develop creative solutions to issues of local concern and identify opportunities of shared interest between the Authority and the local community through the development of the Sites Reservoir Project.

Desired Outcome

CWG – An engagement process that is collaborative, inclusive, and provides a meaningful opportunity for local community leaders to play an active role in the planning and development of the Sites Reservoir Project.

Authority/Project Team – A process that allows the Authority to work in partnership and with a sense of shared purpose with the local community to develop a project that meets the needs of both the Authority and the Community.

Membership

Members will be invited to join the CWG by the Authority. The Project Team will initially identify and invite potential CWG members but will work with the CWG to identify any additional community members that should be added to the CWG as the engagement process proceeds.

CWG will represent a broad cross-section of local government agencies, civic organizations, businesses, and community leaders who represent a constituency affected by the project or who have an interest in the planning, construction, and operation of the project.

CWG membership should be geographically inclusive of locations associated with project facilities – Colusa, Glenn, and Yolo Counties.

A select number of AB/RC participants will be invited to attend the CWG meetings in an "observer" role.

Meeting Structure

Meetings will be held on a bi-monthly basis (October 2022 – December 2023) – 8 meetings. Meetings are anticipated to run between 2-3 hours each and will be held at the Project Office in Maxwell.

CWG members will be informed of meetings through email or direct mail, depending on preference, at least two weeks prior to the meeting. Notification will include planned agenda and any supplemental material required for the meeting.

Meetings are "open" to other members of the public and the press – however the meetings will not be advertised outside of the CWG and are being structured to largely facilitate conversations with the CWG members.

Meetings will be professionally facilitated by the Sites Communications Team. Staff will keep a record of meeting attendees, key issues raised, and any action items that require follow-up by the Authority.

Meeting Topics & Themes

Each meeting will be structured around key project topics/themes in an effort to better focus the discussion and drive to collaborative solutions and mutually beneficial outcomes.

Staff will identify proposed topics/themes – but the list of meeting topics will be refined based on feedback from the CWG. The proposed topics/themes and timing are as follows:

- October 2022 – Community Working Group Kick-Off, General Project Overview
- November 2022 – Project Site Tour
- January 2023 – Issues of Local Concern (e.g., traffic, public safety, community)
- March 2023 – Workforce Development & Jobs
- May 2023 – Recreation
- July 2023 – Authority/Community Partnerships
- September 2023 – Issues of Local Concern (e.g., traffic, public safety, community)
- November 2023 – Issues of Local Concern (e.g., traffic, public safety, community)

Community Working Group Expectations

The CWG is a forum for the local community to provide vital input and feedback to Authority participants and staff to help inform project planning and development activities.

Issues discussed with the CWG should be focused on ones where the community can have some meaningful involvement, help to drive to solutions, and can have a positive impact in the development of the project.

CWG expectations:

- Provide specific local expertise, including identifying emerging local issues
- Attend all meetings possible
- Review all agendas and documents distributed by staff prior to the meetings
- Relay information to his/her respective constituency after each meeting and gather information/ feedback as practicable before each meeting
- Articulate and reflect the interests that CWG members bring to the table
- Maintain a focus on suggestions that benefit multiple interests or the overall project area
- Create a respectful, collaborative, and productive working environment

Authority expectations:

- Provide CWG members the opportunity to collaborate on input and ideas for the Sites Project Authority to consider
- Provide technical expertise
- Brief local decision makers and produce briefing materials and reports
- Provide early notification of CWG meetings and provide any documents for review at least two weeks before each meeting
- Conduct public meetings or workshops if/when necessary to inform and engage the local community
- Manage logistics for CWG meetings
- Provide feedback on how input from the CWG influenced planned project design and construction activities

From: Kim Floyd [kim@floydcommunications.com]
Sent: 1/5/2023 8:38:06 AM
To: Kevin Spesert [kspesert@sitesproject.org]
Subject: This is everything
Attachments: 2021_SitesProgressReport-4-26-2022.pdf; Sites Reservoir CWG Outline_9.16.2022.pdf; Sites_Frequently Asked Questions - 1.12.22.pdf; WALLMAP_Sites_Overview_11x17; hole punch vertical - left side.pdf; Sites_GeneralFS_V2_5-4-2020.pdf; Sites_Community Work Group_06Oct2022_FINAL.pdf; Sites_CWG_Agenda_10.6.22_FINAL.docx; Sites - Community Working Group - October 2022 - Notes - Final.pdf

All to-date working group materials (including meeting summary) are attached.

Thanks,

Kim

Kim Floyd Communications
(916) 838-2666 (c)
kim@floydcommunications.com

Sites

2021 Progress Report

2021 was about progress and momentum-building for the Sites Reservoir project. The accomplishments and milestones of last year brought us much closer to the start of construction. It was a jam-packed year – new insights and results were unveiled after a robust Environmental Review and Public Comment process, and the year was bookended by major federal investments and advancements in the project that underscore the significance of Sites Reservoir as a joint local-state-federal project that benefits the environment and Californians statewide.

We also continued the important work of collaborating with stakeholders across the state, with particular focus on connecting with individuals in the local communities where Sites Reservoir will be built. We consulted with Native American tribes, collaborated with resource agencies, engaged with labor unions who represent working families, and continued engagement with the local, state, and federal public agencies that are at the heart of this project.

Looking ahead, in 2022, the Sites Project Authority will be conducting additional technical field studies to advance the project's design, issuing the project's final Environmental Impact Report, and submitting key regulatory and permitting efforts including submitting the Sites Reservoir water rights application. And as always, we will prioritize outreach and collaboration with stakeholders throughout the state.

The good news is, significant benefits can be possible if Sites Reservoir becomes a reality, including:

Off-stream Storage

Does not create a barrier to native fish migration

Federal and State Agencies Manage Environmental Water

Adaptable to current and future conditions and priorities

Local Leadership and Cooperation

Aligns with Sacramento Valley's values and fosters regional and statewide collaboration

Recreational Opportunities

Provides northern Sacramento Valley with additional opportunities for recreation

Cooperative Operation

Increases effectiveness and efficiency of existing water storage infrastructure

Adaptable to Climate Change

Contributes to system reliability and performance with climate change

Dry Year Water Supply

Reliable dry year water supply for California communities, farms and businesses

Environmental Support

Provides environmental water in drier periods for native fish, and habitat for native species and birds

SITESPROJECT.ORG

2021 HIGHLIGHTS AND MILESTONES

Each achievement in 2021 kept Sites Reservoir on track to remain affordable, permittable, and buildable, all while upholding our mission and values as an organization.

AFFORDABLE

Completed State Funding Feasibility Requirements

Sites Project Authority conducted nine workshops focused on "three big questions" related to financing and satisfying the Proposition 1 requirement for 75% non-public cost share: What do we get? What does it cost us? And how do we pay for it? Following the Authority's submission of the State Feasibility Report, the California Water Commission deemed the Project feasible, which satisfied a key milestone to advancing toward construction. OUTCOME: **Leveraging crucial funds, including a $20 million inflation adjustment to the Proposition 1 award, Sites Reservoir remained eligible for $836 million in state funding.**

Obtained unprecedented federal funding

Following the Secretary of Interior's Federal Feasibility Determination (qualifying the project for up to 25% cost share under the WIIN Act), the Authority worked with federal partners to meet conditions to remain eligible for and secure additional WIIN Act funds. OUTCOME: **$80 million in federal appropriations for Fiscal Year 2022 – the largest of the WIIN Act storage projects – bringing the total to $104 million.**

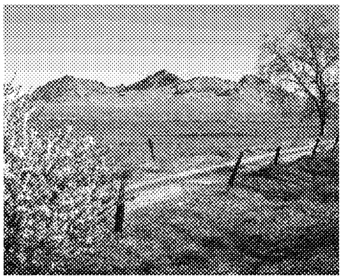
BUILDABLE

Developed the Feasibility Cost Estimate

Following a collaborative effort with Participants, the Authority developed the Feasibility Cost Estimate in June 2021. This estimate provides participants with improved cost certainty. OUTCOME: **The Feasibility Cost Estimate gives participants a higher degree of certainty in the Project's affordability.**

Advanced facilities to approximately 10% design

Following additional analysis and completion of geotechnical investigations, the Authority advanced the Project facilities to approximately 10% design. OUTCOME: **The 10% design effort supports completion of permit applications.**



PERMITTABLE

Released RDEIR/SDEIS for public review and comment

In coordination with Reclamation, the Authority released the RDEIR/SDEIS in November 2021 for public review and comment through two public meetings. OUTCOME: **The Authority remains committed to fostering informed public decision making about Sites Reservoir.**

Continued permit applications

Key permit applications advanced in coordination with state and federal agencies and included executing staffing agreements to expedite the permitting process. OUTCOME: **The Authority advanced permitting and water right elements to provide greater certainty to participants and improve understanding with resource agencies.**

Worked together with non-governmental organizations (NGOs)

The Authority held small group meetings and workshops with members of NGOs related to water rights, water quality, fisheries, terrestrial species, and project ecosystem benefits. OUTCOME: **Through transparent discussions, the Authority collaborated with NGOs to advance the RDEIR/ SDEIS and overall permitting.**

EFFECTIVE ORGANIZATION

Continued 5 Years of Successful External Financial Audits

Responsible management of expenses and funding culminated in 5 years of successful external financial audits. OUTCOME: **The Authority continues to be committed to fiscal responsibility and transparent decision-making.**

Promoted efficiency through improved processes

Following completion of the Strategic Plan, the Authority developed the delegation of authority matrix to promote efficient decision making. The Authority also developed policies and procedures to strengthen the organization. OUTCOME: **The Authority continues to mature the organization.**

Community Working Group Outline: Purpose and Structure

Purpose

The Sites Reservoir Community Working Group (CWG) will provide a forum for representatives of local community agencies, associations, businesses, and civic organizations to work collaboratively with the Sites Project Authority to develop creative solutions to issues of local concern and identify opportunities of shared interest between the Authority and the local community through the development of the Sites Reservoir Project.

Desired Outcome

CWG – An engagement process that is collaborative, inclusive, and provides a meaningful opportunity for local community leaders to play an active role in the planning and development of the Sites Reservoir Project.

Authority/Project Team – A process that allows the Authority to work in partnership and with a sense of shared purpose with the local community to develop a project that meets the needs of both the Authority and the Community.

Membership

Members will be invited to join the CWG by the Authority. The Project Team will initially identify and invite potential CWG members but will work with the CWG to identify any additional community members that should be added to the CWG as the engagement process proceeds.

CWG will represent a broad cross-section of local government agencies, civic organizations, businesses, and community leaders who represent a constituency affected by the project or who have an interest in the planning, construction, and operation of the project.

CWG membership should be geographically inclusive of locations associated with project facilities – Colusa, Glenn, and Yolo Counties.

A select number of AB/RC participants will be invited to attend the CWG meetings in an "observer" role.

Meeting Structure

Meetings will be held on a bi-monthly basis (October 2022 – December 2023) – 8 meetings. Meetings are anticipated to run between 2-3 hours each and will be held at the Project Office in Maxwell.

CWG members will be informed of meetings through email or direct mail, depending on preference, at least two weeks prior to the meeting. Notification will include planned agenda and any supplemental material required for the meeting.

Meetings are "open" to other members of the public and the press – however the meetings will not be advertised outside of the CWG and are being structured to largely facilitate conversations with the CWG members.

Meetings will be professionally facilitated by the Sites Communications Team. Staff will keep a record of meeting attendees, key issues raised, and any action items that require follow-up by the Authority.

Meeting Topics & Themes

Each meeting will be structured around key project topics/themes in an effort to better focus the discussion and drive to collaborative solutions and mutually beneficial outcomes.

Staff will identify proposed topics/themes – but the list of meeting topics will be refined based on feedback from the CWG. The proposed topics/themes and timing are as follows:

- October 2022 – Community Working Group Kick-Off, General Project Overview
- November 2022 – Project Site Tour
- January 2023 – Issues of Local Concern (e.g., traffic, public safety, community)
- March 2023 – Workforce Development & Jobs
- May 2023 – Recreation
- July 2023 – Authority/Community Partnerships
- September 2023 – Issues of Local Concern (e.g., traffic, public safety, community)
- November 2023 – Issues of Local Concern (e.g., traffic, public safety, community)

Community Working Group Expectations

The CWG is a forum for the local community to provide vital input and feedback to Authority participants and staff to help inform project planning and development activities.

Issues discussed with the CWG should be focused on ones where the community can have some meaningful involvement, help to drive to solutions, and can have a positive impact in the development of the project.

CWG expectations:

- Provide specific local expertise, including identifying emerging local issues
- Attend all meetings possible
- Review all agendas and documents distributed by staff prior to the meetings
- Relay information to his/her respective constituency after each meeting and gather information/ feedback as practicable before each meeting
- Articulate and reflect the interests that CWG members bring to the table
- Maintain a focus on suggestions that benefit multiple interests or the overall project area
- Create a respectful, collaborative, and productive working environment

Authority expectations:

- Provide CWG members the opportunity to collaborate on input and ideas for the Sites Project Authority to consider
- Provide technical expertise
- Brief local decision makers and produce briefing materials and reports
- Provide early notification of CWG meetings and provide any documents for review at least two weeks before each meeting
- Conduct public meetings or workshops if/when necessary to inform and engage the local community
- Manage logistics for CWG meetings
- Provide feedback on how input from the CWG influenced planned project design and construction activities

Sites

SITES RESERVOIR

Frequently Asked Questions: **General**

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.

Sites

SITES RESERVOIR

Frequently Asked Questions: **Operations**

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 overlayed 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) 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?

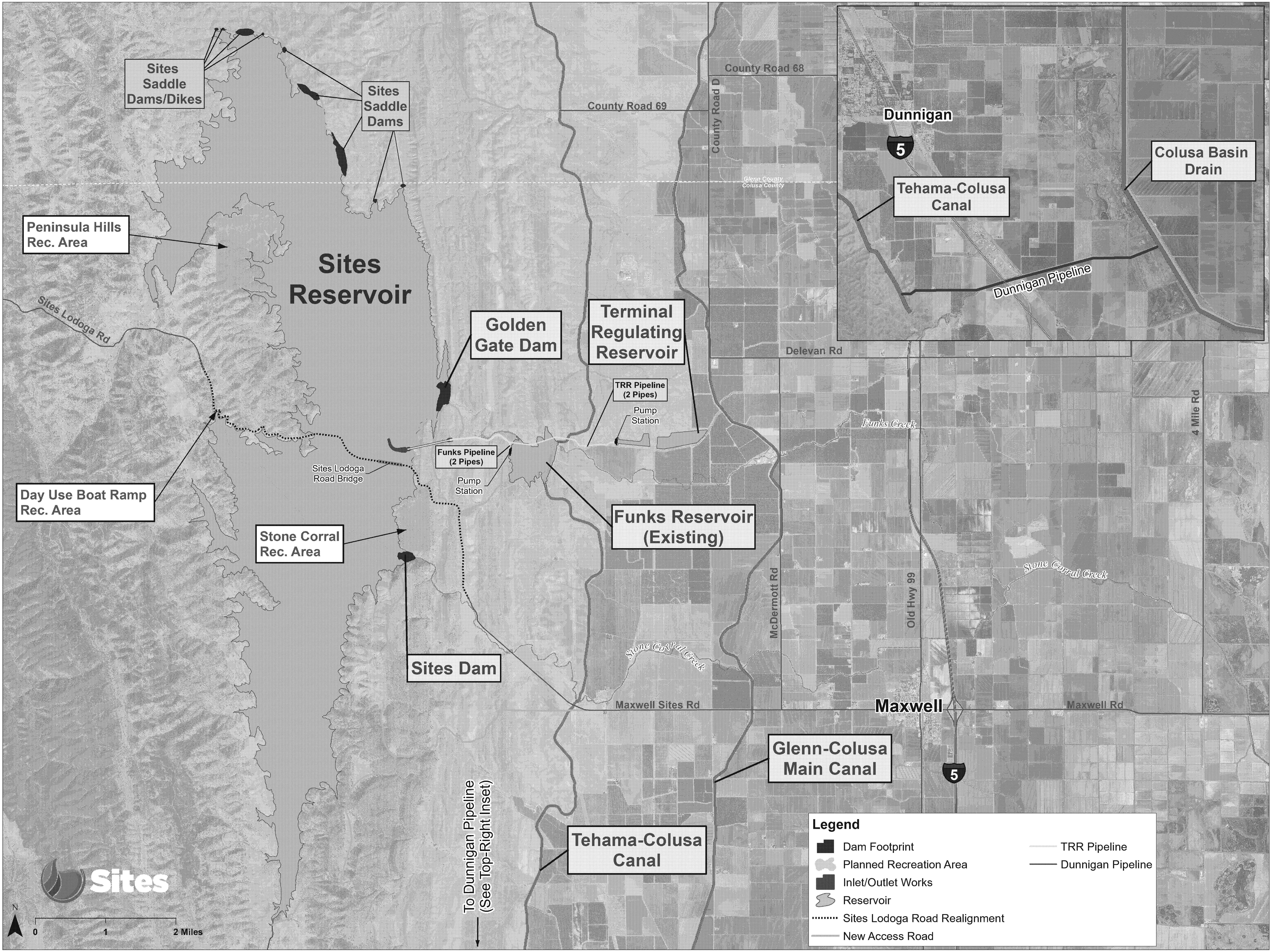
Yes. Both the Sites Project Authority and the Bureau of Reclamation have consulted and will continue to consult with recognized Native American tribes regarding impacts to Tribal people and resources. The Authority has reached out to over a dozen tribes under Assembly Bill 52 and is in ongoing consultation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



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SITES RESERVOIR

Increasing Drier Year Supplies

Sites Reservoir is generational opportunity to construct a multi-benefit water storage project that helps restore flexibility, reliability, and resiliency to our statewide water supply. Simply put, no other storage project currently under consideration in California can positively influence the operational efficiencies of our existing statewide water.

Perhaps what makes Sites Reservoir so unique is that it is not a "traditional" reservoir project. It is an off-stream facility that does not dam a major river system and would not block fish migration or spawning. Rather, Sites Reservoir offers a significant water storage opportunity that benefits both people and the environment.

Sites Reservoir captures and stores stormwater flows from the Sacramento River—after all other water rights and regulatory requirements are met—for release primarily in dry and critical years for environmental use and for California communities, farms, and businesses when it is so desperately needed. Sites Reservoir is designed to be adaptable to a changing climate. As snowpack declines due to climate change and more of our water comes in the form of atmospheric rivers – Sites Reservoir will become even more vital to the future resiliency of our statewide water supply.

How It Works

Located 10 miles west of the town of Maxwell in rural Glenn and Colusa counties, the Sites Reservoir would be an off-stream storage facility that captures and stores stormwater flows in the Sacramento River—after all other water rights and regulatory requirements are met—for release in dry and critical years for environmental use and for California communities, farms and businesses when it is so desperately needed.

When operated in coordination with other Northern California reservoirs such as Shasta, Oroville and Folsom, which function as the backbone to both the Central Valley Project and the State Water Project, Sites Reseravoir will greatly increase flexibility, reliability and resiliency of statewide water supplies in drier periods.

With Sites Reservoir, California has a rare opportunity to enhance statewide water supplies and provide a dedicated allocation of water specifically for the environment.

It provides federal and state resource agencies with a dedicated and reliable supply of water they can manage to provide environmental benefits, especially during drier years.

A significant portion of the project's annual water supplies will be provided for environmental flows, which will help to improve conditions for Delta smelt; help preserve cold-water pools in Shasta later into the summer months to support salmon development, spawning and rearing; and improve Pacific Flyway habitat for migratory birds and other native species.

Sites Reservoir Fast Facts

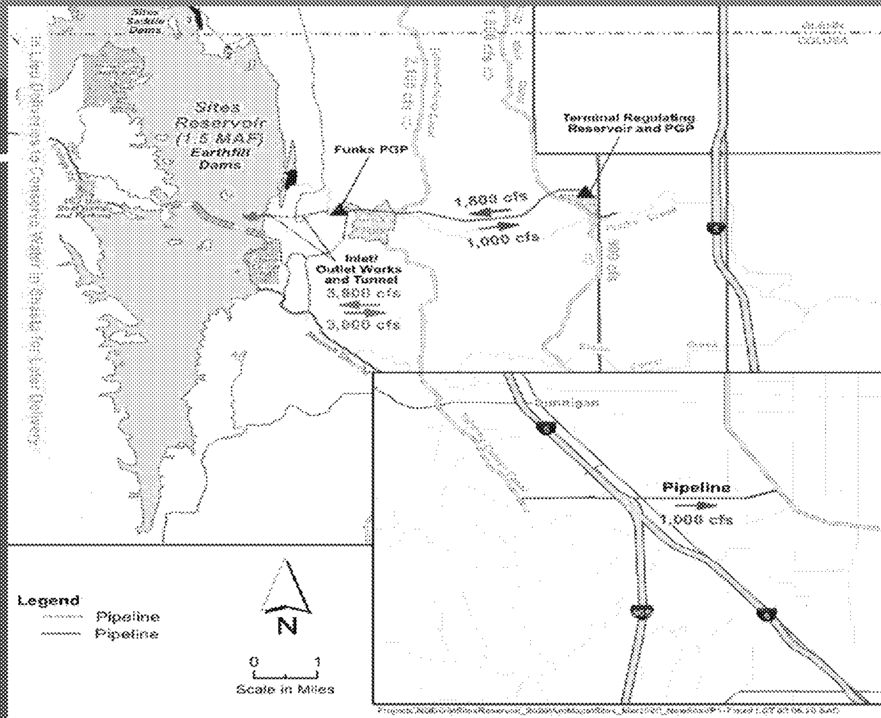
- Provide water for up to **1.5 million homes and businesses** for one year
- Increases Sacramento Valley water storage capacity
- Creates **reliable supplies** for environmental, agricultural, and municipal uses
- **29 participating agencies** representing communities across California

Sites Reservoir Benefits

- **Reliable dry-year water supply for California communities, farms and businesses**
- **Improved water quality**
- **Groundwater recharge**
- **Flood management**
- **Contribution to California's renewable energy goals**
- **Environmental water in drier periods for native fish and Pacific Flyway habitat for migratory birds and other native species**
- **Recreational opportunities**
- **Creation and protection of middle class jobs, including a large skilled work force during seven-year construction**

Support and Funding

Widely supported both regionally and statewide, the project has made significant progress. A bipartisan group of more than 175 organizations, agencies, businesses and elected officials support the Sites Reservoir Project. In 2018, the project was awarded $816 million in funding from California's Proposition 1 water bond, and secured a $449 million investment from the United States Department of Agriculture. The United States Bureau of Reclamation is also a significant project partner.



The Sites Reservoir would be an off-stream storage facility located 10 miles west of the town of Maxwell, California in rural Colusa County.

Sites Reservoir Participating Entities

Colusa County *
Colusa County Water District *
Glenn-Colusa Irrigation District *
Glenn County *
Placer County Water Agency & City of Roseville *
Reclamation District 108 *
Sacramento County Water Agency & City of Sacramento *
Tehama-Colusa Canal Authority *
Westside Water District *
TC 4 **
Western Canal Water District **
American Canyon, City of
Antelope Valley-East Kern Water Agency
CA Department of Water Resources (Ex Officio)
Carter Municipal Water Company
Coachella Valley Water District
Cortina Water District
Davis Water District
Desert Water Agency
Dunnigan Water District
LaGrande Water District
Metropolitan Water District
San Bernardino Valley Municipal Water District
San Gorgonio Pass Water Agency
Santa Clara Valley Water District
Santa Clarita Valley Water Agency
US Bureau of Reclamation (Cost-share)
Wheeler Ridge-Maricopa Water Storage District
Zone 7 Water Agency

* Authority Board Member
** Associate Board Member

What Makes Sites Reservoir Different?

Features	Benefits
Off-stream storage	Does not create barriers to native fish migration Improves local flood management Improved conservation of stored water to be available when it is needed most
Cooperative operations	Increases effectiveness and efficiency of existing water storage infrastructure
Sacramento Valley-led	Aligns with Sacramento Valley's values Authority will be an integral part of community Fosters regional and statewide collaboration
Beneficiary pays	Provides equity among participating partners Improves accountability and value creation
Federal and state agencies manage environmental water	Adaptable to current and future conditions and priorities Ensures federal and state environmental priorities are met—today and into the future
Adaptable to climate change	Operational flexibility to ensure the water will be applied to the highest beneficial uses despite an uncertain future

FOR MORE INFORMATION, PLEASE VISIT **WWW.SITESPROJECT.ORG.**

Sites Reservoir Project Overview

Community Work Group

October 6, 2022

Sites

Meeting Overview

- Welcome & Introductions
- Community Working Group Overview
- Sites Reservoir Project Update
- Identification of Community Issues/Concerns/Opportunities
- Future Meetings
- Other Discussion/Public Comment
- Adjourn

Working Group Introductions

- Members & Sites Representatives
- Review of meeting materials
    - Binder organization
        - Working Group information
        - Sites Reservoir Project information
        - Project FAQs
        - Project Progress Report
        - Meeting agendas & materials

Working Group: Purpose & Scope

- Identify and prioritize issues for discussion
- Discuss/recommend solutions to issues of local concern
- Inform project planning/development
- Focus on areas that can be influenced
- Involve local government, public safety, business, civic groups
- Meet bi-monthly in 2023, proposed tour in November 2022

Questions

Sites

Sites Project History

- **1957** - DWR Bulletin 3 identifies Sites Reservoir as a proposed project in the 1957 California Water Plan
- **1997** – Project is evaluated as part of the CALFED water management framework for ecosystem restoration
- **2010** – Sites Joint Powers Authority is formed to serve as the lead local agency to advance the project
- **2014** – California passes Proposition 1 that provides $2.7 billion for water storage projects, dams and reservoirs.

Sites Project History

- **2016** – Sites Project Reservoir Committee formed, and Draft EIR/EIS released
- **2018** – Project is awarded $816 million from Proposition 1 and a $449 million construction loan from USDA
- **2019** – The Sites Project goes through an extensive value planning process to make the project more affordable, permittable, and buildable
- **2021** –California Water Commission certifies that the project is technically feasible, and the Authority releases a revised Draft EIR/EIS
- **2022** – The Sites Project is invited to apply for a $2.2 billion federal loan from the WIFIA program and submits its Water Rights Application

Sites Project Authority

- Joint Powers Authority established under California law
- Authority member agencies located in the Sacramento Valley
- Reservoir Committee made up statewide agencies investing in the Sites Project
- The Sites Project Authority will own and operate Sites Reservoir

Board of Directors:
Colusa County
Colusa County Water District
Glenn County
Glenn-Colusa Irrigation District
Placer County Water Agency/City of Roseville
Reclamation District 108
Sacramento/Sac County Water Agency
Tehama-Colusa Canal Authority
Westside Water District

Our Strength is in Our Broad Statewide Participation

Sacramento Valley

City of American Canyon

Colusa County

Colusa County Water Agency

Cortina Water District

Davis Water District

Dunnigan Water District

Glenn County

Glenn-Colusa Irrigation District

LaGrande Water District

Placer County Water Agency

Reclamation District 108

City of Roseville

Sacramento County Water Agency

City of Sacramento

Tehama-Colusa Canal Authority

Westside Water District

Western Canal Water District

Bay Area

Santa Clara Valley Water District

Zone 7 Water Agency

San Joaquin Valley

Wheeler Ridge-Maricopa Water Storage District

Rosedale-Rio Bravo Water Storage District

Southern California

Antelope Valley – East Kern Water Agency

Coachella Valley Water District

Desert Water Agency

Irvine Ranch Water District

Metropolitan Water District

San Bernardino Valley Municipal Water District

San Gorgonio Pass Water Agency

Santa Clarita Valley Water Agency

Waiting List

Cal-Am Sacramento
City of Napa
Delta View WUA
Glenn County
La Cumbre MWC
Madera County
Pacific Resources MWC
Santa Clara Valley WD
Westlands WD
Wheeler Ridge Maricopa WSD
Woodland Davis CWA

Sites

Sites Reservoir

- Off-stream reservoir
- Utilizing existing infrastructure to 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
- Funded by State and Federal governments and local public water agencies
- A key tool to help the state restore flexibility, reliability, and resilience to our statewide water supply

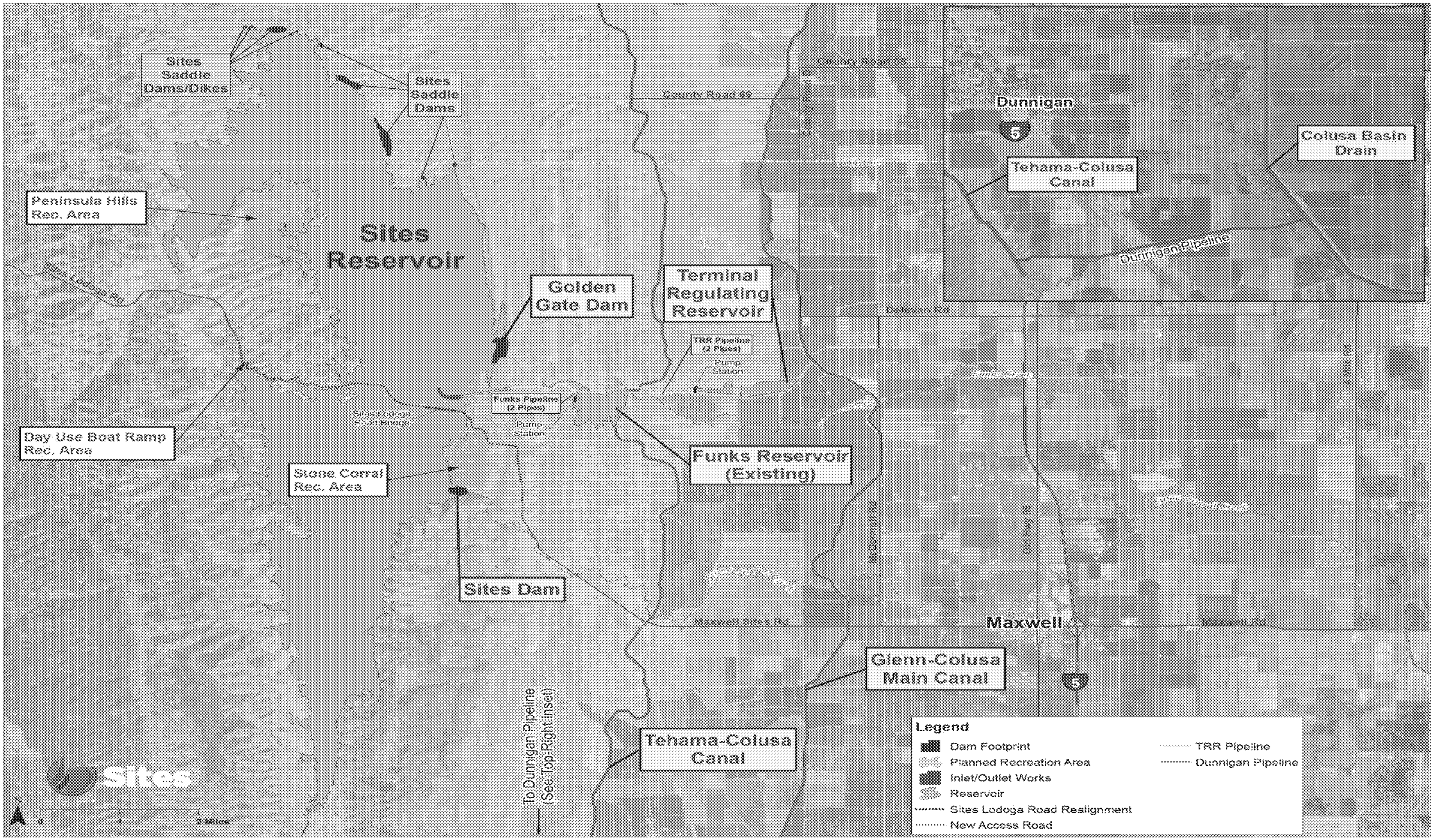
Affordable, Permittable, Buildable

Sites underwent a rigorous value planning effort that resulted in a "right-sized" project. The Sites Reservoir of today:

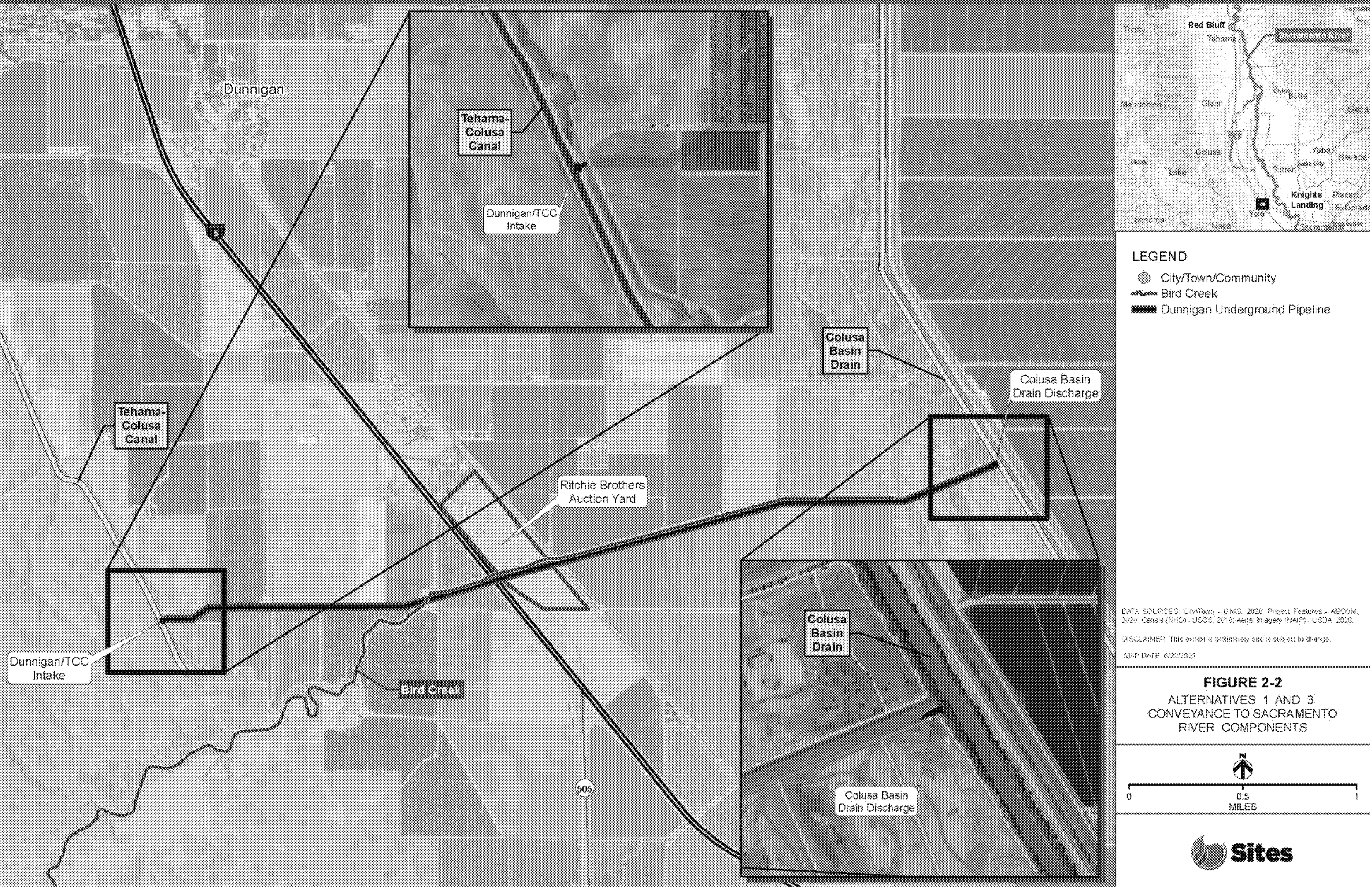
- Has a smaller footprint - less environmental effects
- Eliminates controversial conveyance infrastructure
- Meets the water supply needs of participants
- Is more affordable for local agencies
- Accommodates a range of federal investment from 7%-25%
- Continues to support the State's basis of MCED
- Performs under most challenging climate change scenarios

Sites

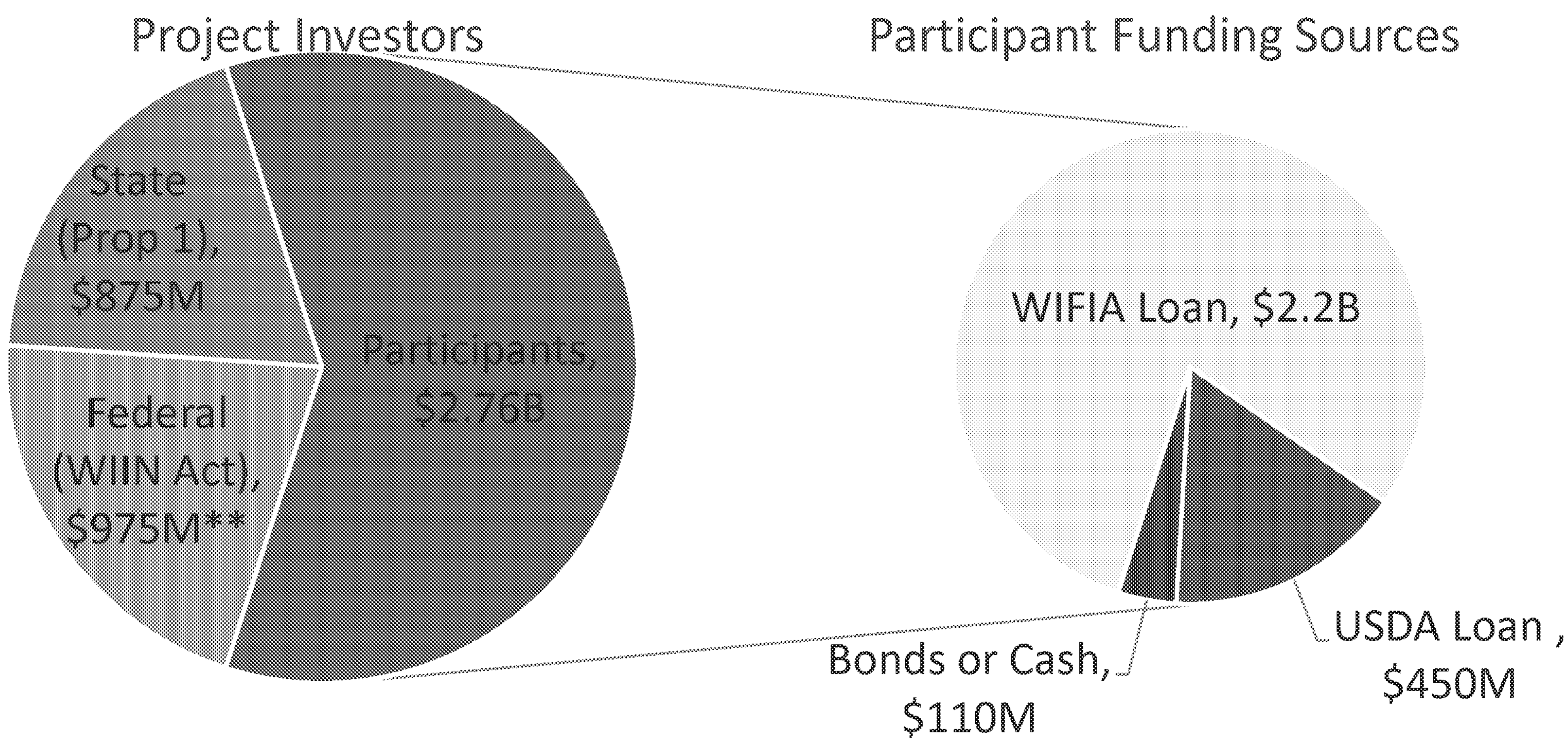
Project Facilities



Project Facilities



Project Funding Sources



**WIIN Act funding is based on Reclamation investment under Alternative 3 (Preferred Project) and is reported in 2021 dollars.

Environmental Planning & Permitting Update

- Environmental Impact Report
  - Draft document
    - Released for public review in November 2021
    - Comment period closed in January 2022
  - Final document
    - Expected in early 2023
    - Revisions to draft to address concerns raised
    - Response to comments received on the draft document
- Water Right Permit
  - Submitted application to State Board in May
  - Expect Board to complete review in coming month(s) and notice for public review/protests

Engineering Update

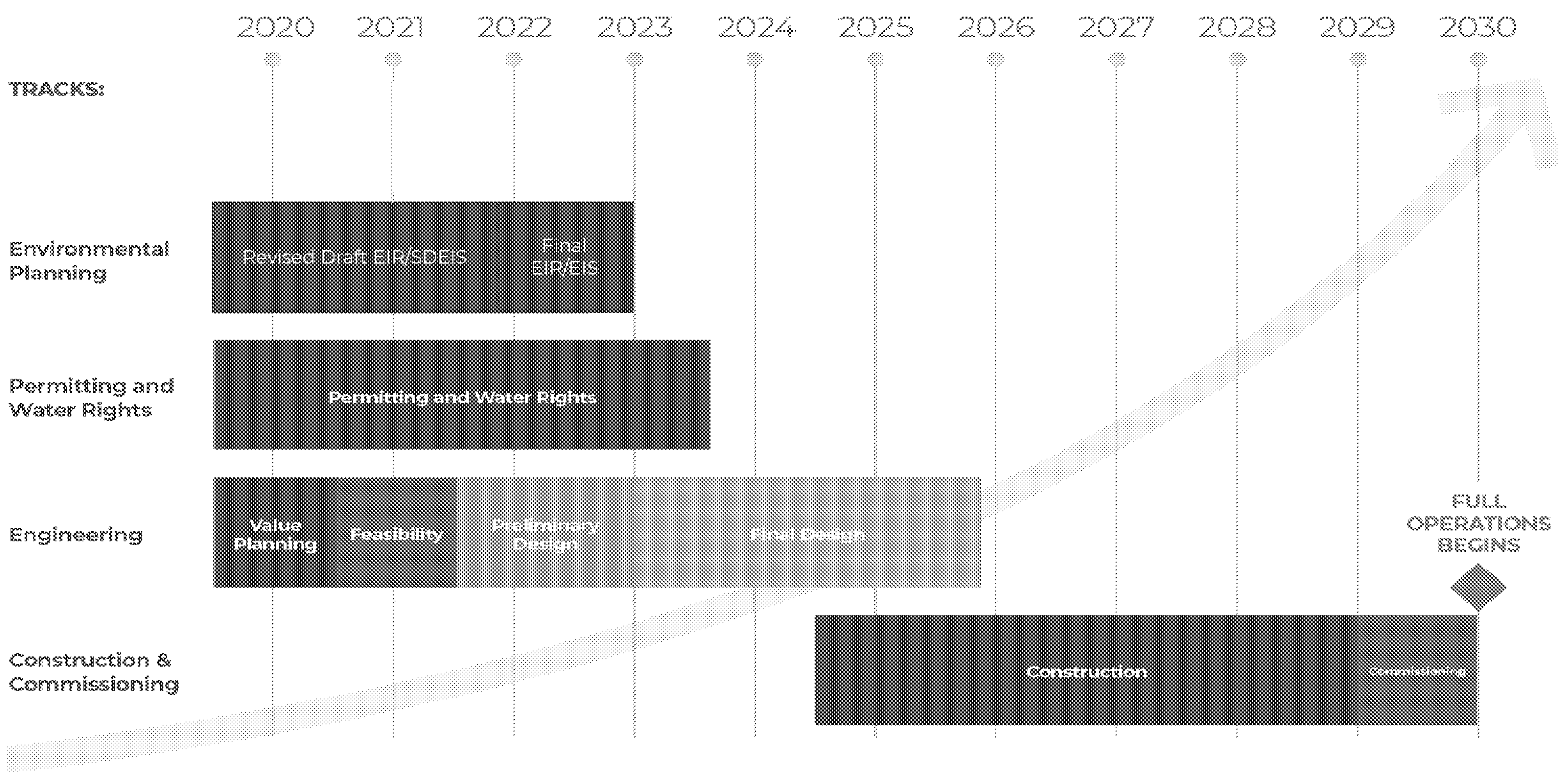
- 2021 – Completed the Feasibility Analysis
  - The California Water Commission Determined the Project is Feasible
- 2022-2024 – Initiate Field Studies
  - Survey Mapping & Geotechnical Investigations to Inform Preliminary Engineering Analysis and Design
- 2024 – Complete Preliminary Engineering
  - Update Project Cost Estimate
- 2024 and Beyond – Key Agency Reviews and Approvals and begin Construction

Real Estate Update

- Soliciting Landowner feedback on the project design
- Ongoing coordination with Landowners regarding the anticipated land needs for the project
- Securing Temporary Rights of Entry (TROE) and other agreements to conduct necessary technical field activities
- Discussions with Landowners regarding potential early real estate actions on key project parcels or parcels associated with major project infrastructure

Project Schedule

Sites Reservoir Project Schedule



Draft_0021603

Project Next Steps/Goals: 2022 – 2024

- Secure Final Prop 1 Funding award with CWC
- Execute Final Operations Agreement
- Secure WIIN and BIL Federal Funding
- Complete WIFIA/USDA Loan Agreements
- Execute Benefits and Obligations Contracts
- Complete Final EIR/EIS
- Obtain Critical Environmental Permits (BO, ITP, 404)
- Receive Water Right Order and Permit
- Obtain Local Agency Agreements and Permits
- Execute Benefits Contracts with DWR and CDFW

Sites

Project Next Steps/Goals: 2022 – 2024

- Develop Mitigation Acquisition Master Plan
- Initiate Application for DSOD Permit to Construct
- Advance Engineering Design to achieve Level 3 cost estimate
- Determine Procurement and Delivery Strategy
- Determine Overall Project Schedule
- Develop and Implement Land Acquisition Master Plan
- Conduct Geotech Investigations and Evaluations
- Perform Geotech Evaluation of all "Willing Seller" Properties
- Determine Organization Structure and Governance

Sites

Questions

Sites

Identification of Community Concerns

- Traffic
- Public safety
- Community "preservation"
- Workforce development/jobs
- Recreation
- Sites Project Authority/Community partnerships
- Others?

Future Meetings

- Project site tour (November)
- Bi-monthly, beginning January 2023
- 3-5 p.m., third Thursday of the month, starting in January
- Priority issue(s) for January meeting

Questions/Other Discussion

Sites

Sites

Sites Project Authority Meeting 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 Information:

Date:	October 6, 2022	**Location:**	122 Old Hwy 99W, Maxwell
Start Time:	9 a.m.	**Finish Time:**	12 noon
Purpose:	Community Working Group		

Meeting Participants:

Agenda:

Discussion Topic	Topic Leader
1. Welcome & Introductions	Sara Katz
2. Community Working Group Overview a. Purpose & Objectives	Sara Katz
3. Sites Reservoir Project Update	Jerry Brown
4. Identification of Community Issues/Concerns/Opportunities a. Prioritization of topics for future meetings	Sara Katz/All
5. Future Meetings	Sara Katz
6. Other Discussion/Public Comment	Sara Katz
7. Adjourn	Jerry Brown

Sites Project Community Working Group Meeting Highlights

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 Information:			
Date:	October 6, 2022	**Location:**	122 Old Hwy 99W, Maxwell
Start Time:	9 a.m.	**Finish Time:**	12 p.m. noon
Purpose:	Community Working Group		

Meeting Participants:	
Juleah Cordi –Assemblymember Gallagher	Joyce Bond – Stonyford Museum
Mike Ha – Yolo County Sheriff's Office	Randal Toews – Kanawha Glenn Fire District
Monica Sanky – Colusa County Farm Bureau	Tom Arnold – Supervisor, Glenn County
Lisa Humphreys – Glenn County Farm Bureau	Gary Evans – Supervisor, Colusa County
Marcie Skelton – Glenn Co. Ag. Commissioner	Anastacia Allen – Colusa Co. Ag Commissioner
Wendy Tyler – Colusa County	Eric Paden – Maxwell Inn
Jennifer Diaz – Colusa Co. Chamber of Commerce	Breyden Coma – Senator Dahle
Summer Shadley – Maxwell Unified School District	Kenny Cohan – Maxwell Fire District
Denise Sagara – Yolo County Farm Bureau	Nadine Bailey – Family Water Alliance
Rita Durgin – Assemblymember Aguiar-Curry	Sergeant Ruiz – Colusa County Sheriff's Dept.

Welcome & Introductions

Sara Katz (meeting facilitator) welcomed all in attendance to the initial meeting of the Sites Reservoir Project's Local Community Working Group. Sara invited the attendees to introduce themselves, share their familiarity with the project, and to describe the organizations they represent.

Community Working Group Overview

Sara provided an overview of the purpose and objectives of the Community Working Group; outlined the proposed structure of the Working Group, the Working Group's scope, membership, and participation; and discussed the expectations for Working Group Members, and the Authority commitments.

Sites Reservoir Project Update

Sites Project Authority Executive Director Jerry Brown provided an overview presentation on the Sites Reservoir Project. The presentation covered the Project's history, governance structure, participants, project facilities, proposed operations, current environmental planning, engineering, real estate activities, and planned work activities through the end of 2024. Jerry highlighted the nature of the Sites Reservoir as being uniquely designed as an off-stream reservoir, and able to meet the needs of farmers, families, and the environment, and serve as a key tool to help the State of California restore flexibility, reliability, and resilience to the statewide water supply. The Project has been sized to ensure that it can deliver for its Participants as an affordable, permittable, and buildable endeavor.

The Community Working Group Members shared their questions, including:

How many Participants have dropped out due to cost?

Over the past few of years, some participants in the Sacramento Valley, Central Valley, and Southern California decided to withdraw from the project due to affordability concerns or for other organizational reasons. The Authority currently has a waiting list of 11 additional agencies who have interest in becoming participants and is regularly contacted by additional parties throughout the state who are interested in becoming a participant.

Is there a priority for Sac Valley Participants on the waiting list?

the Authority is awaiting a final determination regarding the participation level of the US Bureau of Reclamation. Once that level of participation is finalized, the Authority will then evaluate the continued interest of the agencies and organizations on the waiting list, and work with those parties to determine next steps.

Is Yolo County benefiting?

Yolo County agencies are represented on the Authority Board of Directors and the Reservoir Committee (Reclamation District 108 & Dunnigan Water District) and there are several Yolo County farmers who are investing in the Project for water supply benefit. In addition to this participation, the Authority is working with Yolo County agencies and organizations with regard to existing facilities that would be used by the Project (Colusa Basin Drain and Knights Landing Ridge Cut) and landowners who are potentially affected by the use of those facilities. As proposed, the Project will have the broader benefits of increasing Northern California and statewide water supply flexibility, reliability, and resilience, which will have benefits to Yolo County and beyond.

Is the Project engaged with local Tribal Representatives?

The Authority has been formally engaged with local Tribal Governments as part of the Authority's commitment to the AB 52 process and will continue to work in collaboration with Tribal Communities as the Project develops. Additionally, the Authority is working in partnership with local Tribal Governments to coordinate geotechnical field activities. For this work, the Tribes are providing vital Tribal Cultural Resource Monitoring services for the Authority.

Were the Tribes invited to be Participants in the Project?

Yes, however they chose not to participate but are continuing to engage in the development of the Project.

What is the status of the Project's environmental review?

The Authority released a Draft EIR/EIS for public review in November 2021. The public comment period closed on January 28, 2022. The Authority received approximately 100 substantive comments and is currently working to address those comments. The Authority will release a Final EIR/EIS in 2023.

How is the amount of flow available for the Project determined?

Determining available flows includes complicated factors such as: ensuring senior water right holders needs are met, regulatory requirements for environmental flows are met, protection of aquatic species, timing of the available flows, and permit conditions applied to the operations of the Project. Based on modeling data conducted by the Authority, the Sacramento River has water available for diversion in just about all water year types - including in dryer years when flashy storms pass through Northern California and create flows that meet all of the operational conditions that allow for the project to divert water. The modeling shows that the project performs every better under the most difficult climate change projections.

What is the significance of being an off-stream reservoir?

Sites Reservoir will not dam any rivers or streams, thus avoiding impacts to aquatic species (particularly salmon) migration. Instead, Sites Reservoir will tie into existing off-stream infrastructure to allow for a supply of water from the Sacramento River during storm events and times of extreme precipitation – often referred to as "atmospheric rivers" – when significant amounts of rain occur in a very short period of time. This excess water would be diverted and held in the reservoir for use during those years when the state is struggling with drought and other climate stressors. In addition to the benefits of improved water storage, Sites Reservoir would also provide enhanced flood control, bringing increased flood safety to local communities.

What percentage of water is being used for each purpose?

The proposed uses for water stored in Sites Reservoir benefits all three of our State's most key water needs – agriculture, municipal and industrial uses, and the environment. As proposed, water use is anticipated to be as follows:

Agriculture:	Approximately 30%
Municipal and Industrial:	Between 30% to 50%
Environmental:	Between 20% to 40%

Identification of Community Issues, Concerns, Opportunities

Community Working Group Members provided input on issues of Community Concern and Opportunity they would like included as future meeting agenda topics. The following suggestions were offered:

- Water for Agriculture – Community Preservation
- White Areas (geographic areas that are not within water district service boundaries)
- Community Education in communities north of the project area
- Sac-Valley-Specific Education on how the Project is proposed to operate
- Workforce Development – housing for workers who will be engaged in the Project
- Possible Air Pollution Impacts During Construction
- Possible Impacts to Farms and Farm Workers
- Dunnigan Pipeline

Future Meetings

Sara led the CWG in a discussion regarding future meeting frequency, proposed dates, and times of day. The CWG Members agreed to the frequency of bi-monthly, starting in January 2023. It was also agreed that the third Thursday of the month was workable, with a preferred meeting time of 2:30 pm – 4:30 pm. For planning purposes, the following dates were selected:

- January 19, 2023
- March 16, 2023
- May 18, 2023
- July 20, 2023
- September 21, 2023
- November 16, 2023

Sites Staff offered to conduct a Project Tour, for the benefit of the CWG, to provide a visual and geographic understanding of the project, the possible community impacts, and what types of mitigation might be considered to offset those impacts (e.g. traffic). Two dates were proposed: November 5 and November 12. Those interested in taking a tour agreed to a November 12 date, with an e-mail invitation to be forthcoming.

Members shared closing comments, and Sites Representatives thanked everyone for their interest and participation. The meeting adjourned at 11:50 am.

Sites Reservoir Project - 3 Month Look Ahead

Primary	Assigned To	Governing Body
January 2023		
Consent Items		
Minutes	Sandra Yarbrough	Joint Authority Board & Reservoir Committee
Treasurer's Report	Joe Trapasso	Joint Authority Board & Reservoir Committee
Payment of Claims	Joe Trapasso	Joint Authority Board & Reservoir Committee
$160M FAA Approval	Joe Trapasso	Joint Authority Board & Reservoir Committee
Action Items		
None	Joe Trapasso	Joint Authority Board & Reservoir Committee
Discussion and Informational Items		
USDA Loan Update	Ali Forsythe, JP Robinette, Kevin Spesert	Joint Authority Board & Reservoir Committee
Response to Reclamation Participation Letter	Jerry Brown	Joint Authority Board & Reservoir Committee
Converting to storage allocation - what are the steps we're going to get there?	Angela Bezzone	Joint Authority Board & Reservoir Committee
Monthly Reporting (Monthly Status Report, Work Plan, Action Items)	All	Joint Authority Board & Reservoir Committee
Closed Session		
Communicate on "Common Interest" Approach	A Doud	Joint Authority Board & Reservoir Committee
Concurrence on Principles of Reclamation Benefits & Obligations Contract and Warren Act Contract	Jerry Brown	Joint Authority Board & Reservoir Committee
Placeholder - BiOp and ITP Negotiations	Ali Forsythe, John Spranza	Joint Authority Board & Reservoir Committee
Committees/Workgroups		
No EPP Work Group This Month		
Governance AdHoc	Jerry Brown	Joint Governance Ad Hoc Committee
Review Considerations for Establishing Project Baseline Schedule	Henry Luu, JP Robinette	Reservoir Operations & Engineering Workgroup
Review process and considerations for converting to storage based allocations. This will be coordinated with July soft call.	aforsythe@sitesproject.org, Angela Bezzone	Reservoir Operations & Engineering Workgroup
Payment of Claims	Joe Trapasso	Joint Budget & Finance Committee
Report out on WIFIA Ad Hoc Subcommittee Meeting	JP Robinette	Joint Budget & Finance Committee
USDA Loan Update	JP Robinette	Joint WIFIA Ad Hoc Subcommittee
Tribal Engagement Working Group - Kick-off Meeting	Ali Forsythe, Kevin Spesert	
Status update on ROW manual	Kevin Spesert	Land Management Committee
Revisions to the Real Estate TROE Compensation Policy	Kevin Spesert	Land Management Committee
Review ROE Requirements for Project Baseline Schedule and Alternatives Analysis	Henry Luu, JP Robinette	Land Management Committee
Local Community Working Group (Bi-Monthly)	Kevin Spesert	
February 2023		
Consent Items		
Minutes	Sandra Yarbrough	Joint Authority Board & Reservoir Committee
Treasurer's Report	Joe Trapasso	Joint Authority Board & Reservoir Committee
Payment of Claims	Joe Trapasso	Joint Authority Board & Reservoir Committee
4th Quarter Financial Report - Report on actuals for 2022 compared to budget and determine the final 2022 carryover.	Joe Trapasso	Joint Authority Board & Reservoir Committee
Action Items		
Conduct Elections of RC/AB Officers	Jerry Brown	Joint Authority Board & Reservoir Committee
Facility Partner Cooperative Agreement	Cheyanne Harris, JP Robinette	Joint Authority Board & Reservoir Committee
Placeholder - Seek an amendment to WSIP EFA to account for full 5% of $875M and other contract adjustments	Joe Trapasso	Joint Authority Board & Reservoir Committee
Approve 2023 Federal/State Legislative Priorities	Kevin Spesert	Joint Authority Board & Reservoir Committee
Placeholder - Approve revisions to the Real Estate TROE Compensation Policy	Kevin Spesert	Joint Authority Board & Reservoir Committee
Discussion and Informational Items		

Primary	Assigned To	Governing Body
Baseline Schedule - Discussion of alternatives and possible accelerated schedule, schedule in WIFIA application	Henry Luu, JP Robinette	Joint Authority Board & Reservoir Committee
Status update on A3 Cash Call 2A - Has everyone paid?	Marcus Maltby	Joint Authority Board & Reservoir Committee
Final EIR/EIS Status Briefing - Part 1 of 3 in Preparation for Approval of Project	aforsythe@sitesproject.org, Laurie Warner Herson	Joint Authority Board & Reservoir Committee
Kick off B&O Contract Development - Layout Roadmap to getting these completed	Cheyanne Harris, Elizabeth Cousins, JP Robinette	Joint Authority Board & Reservoir Committee
Monthly Reporting (Monthly Status Report, Work Plan, Action Items)	All	Joint Authority Board & Reservoir Committee
Closed Session		
"Making Room" for Reclamation Investment - Select approach from the presented Alternatives	Angela Bezzone, Jerry Brown	Joint Authority Board & Reservoir Committee
Update on Water Rights Resubmittal	Ali Forsythe	
Prop 1 FA/PBA/AMP Update, including update on progress of EWM Pilot	Jerry Brown	
Short-term Eagle Permit Negotiations	Ali Forsythe	Joint Authority Board & Reservoir Committee
Placeholder - BiOp and ITP Negotiations	Ali Forsythe, John Spranza	Joint Authority Board & Reservoir Committee
Committees/Workgroups		
Governance AdHoc	Jerry Brown	
Update on Sites/DWR/Reclamation Operations Agreement	Angela Bezzone, Jerry Brown	Reservoir Operations & Engineering Workgroup
Update on GCID canal modeling and considerations for TRR sizing	Henry Luu, JP Robinette	Reservoir Operations & Engineering Workgroup
Update on DSOD engagement	Henry Luu, JP Robinette	Reservoir Operations & Engineering Workgroup
Assumptions and considerations related to the CAISO Interconnection Application	Henry Luu, JP Robinette	Reservoir Operations & Engineering Workgroup
Options related to reservoir storage size based on latest survey and mapping information	Henry Luu, JP Robinette	Reservoir Operations & Engineering Workgroup
Review Project Baseline Schedule and alternatives analyses including potential accelerated activities, schedule in the WIFIA application	Henry Luu, JP Robinette	Reservoir Operations & Engineering Workgroup
Final EIR/EIS Status Briefing - Part 1 of 3 in Preparation for Approval of Project - Where does Section 2.5 compliance fit into this plan?	aforsythe@sitesproject.org, Laurie Warner Herson	Environmental Planning & Permitting Workgroup
Payment of Claims	Joe Trapasso	Joint Budget & Finance Committee
4th Quarter Financial Report	Joe Trapasso	Joint Budget & Finance Committee
WIFIA Loan Application and Indicative Rating Update	Brian Thomas, Derek Gardels, JP Robinette	Joint WIFIA Ad Hoc Subcommittee
2023 State/Federal Leg Priorities	Kevin Spesert	Legislative & Outreach Committee
2023 Communications Planning	Kevin Spesert	Legislative & Outreach Committee
March 2023		
Consent Items		Joint Authority Board & Reservoir Committee
Minutes	Sandra Yarbrough	Joint Authority Board & Reservoir Committee
Treasurer's Report	Joe Trapasso	Joint Authority Board & Reservoir Committee
Payment of Claims	Joe Trapasso	Joint Authority Board & Reservoir Committee
Action Items		Joint Authority Board & Reservoir Committee
Chairs Assignments of Committees and Workgroups	Jerry Brown	Joint Authority Board & Reservoir Committee
Short-term Eagle Permit - Approve Executive Director Signing and Pay Mitigation Fees	John Spranza	Joint Authority Board & Reservoir Committee
Master Lake and Streambed Alteration Agreement Application - Approval to Submit (Consider to move to consent item)	Ali Forsythe, John Spranza	Joint Authority Board & Reservoir Committee
Authorize submittal of WIFIA Application	Cheyanne Harris, Derek Gardels, JP Robinette	Joint Authority Board & Reservoir Committee
Discussion and Informational Items		
Final EIR/EIS Status Briefing - Part 2 of 3 in Preparation for Approval of Project	aforsythe@sitesproject.org, Laurie Warner Herson	Joint Authority Board & Reservoir Committee
Clean Water Act 404 and 401 Permit Applications - Overview in Prep to Approve Submittal next Month - pls make sure Section 2.5 is met prior to board presentation	Ali Forsythe, Jelica Arsenijevic	Joint Authority Board & Reservoir Committee
Section 106 - Cultural Resources Status Update	Ali Forsythe	Joint Authority Board & Reservoir Committee
Placeholder - Water Rights - Protests Status Update Briefing (Want to have this after the protest period closes)	aforsythe@sitesproject.org	Joint Authority Board & Reservoir Committee
Governance Committee Update	Jerry Brown	Joint Authority Board & Reservoir Committee

Primary	Assigned To	Governing Body
Monthly Reporting (Monthly Status Report, Work Plan, Action Items)	All	Joint Authority Board & Reservoir Committee
Closed Session		
Section 106 - Cultural Resources Negotiations	Ali Forsythe	Authority Board & Reservoir Committee
Clean Water Act 404 and 401 Permit Applications	Ali Forsythe, Jelica Arsenijevic	Authority Board & Reservoir Committee
Committees/Workgroups		
No O&E Work Group This Month		
Governance Meeting	Jerry Brown	Joint Governance Committee
Final EIR/EIS Status Briefing - Part 2 of 3 in Preparation for Approval of Project	aforsythe@sitesproject.org, Laurie Warner Herson	Environmental Planning & Permitting Workgroup
Clean Water Act 404 and 401 Permit Applications - Overview in Prep to Approve Submittal next Month	Ali Forsythe, Jelica Arsenijevic	Environmental Planning & Permitting Workgroup
Section 106 - Cultural Resources Status Update	Ali Forsythe	Environmental Planning & Permitting Workgroup
Water Rights - Protests Status Update Briefing (Want to have this after the protest period closes)	Ali Forsythe, John Spranza	Environmental Planning & Permitting Workgroup
Payment of Claims	Joe Trapasso	Joint Budget & Finance Committee
Placeholder - Submittal of WIFIA Application	Cheyanne Harris, JP Robinette	Joint WIFIA Ad Hoc Subcommittee
Placeholder - report out on WIFIA Ad Hoc Subcommittee Meeting	Cheyanne Harris, JP Robinette	Joint Budget & Finance Committee
Placeholder - Proforma 2.0 Update to Support mid-2023 Participant 'Soft Call'	bgtmwd@gmail.com, JP Robinette	Joint Budget & Finance Committee
Procurement Strategy [Contract Strategy Workgroup]	Cheyanne Harris, JP Robinette, Pat Tangora	O&E Ad Hoc Sub-Workgroup
Tribal Working Group	Kevin Spesert	

Local Community Working Group Meeting Agenda

Sites

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 Information:			
Date:	January 19, 2023	**Location:**	122 Old Hwy 99W, Maxwell
Start Time:	2:30 p.m.	**Finish Time:**	4:30 p.m.
Purpose:	Local Community Working Group		

Meeting Participants:

Agenda:

Discussion Topic	**Topic Leader**
1. Welcome & Introductions	Kim Floyd
2. Project Update	Jerry Brown
3. Overview of Revised Environmental Impact Report/Environmental Impact Statement	Ali Forsythe
4. Current Engineering Design/Construction Considerations	JP Robinette
5. Future Meetings	Kim Floyd
6. Other Discussion/Public Comment	Kim Floyd
7. Adjourn	Jerry Brown

From: Marcia Kivett [MKivett@sitesproject.org]
Sent: 1/9/2023 10:08:11 AM
To: Kevin Spesert [kspesert@sitesproject.org]
Subject: My notes are in red.

1. Executive Director

1/23 Bd Mtg Closed Session Responsibilities - I will schedule a premeeting that you will be a part of on the Warrenxxxxxx

Consideration of Sites Committees and Workgroups

- General - rules for who can be on what. The only limitation will be on people. No name changes so not to confuse people. Adding an ad hoc committee will be related to Facility Use and will consist of the same individuals.

a.

- Charter Documents - Plan at the next committee meeting to go over your charter documents with you committee. Work with Jerry to go over any charter document documents adjustments.
- LT Water Transfer Framework - Have Jerry go over this item with you on the 1v1. There was a lot of discussion on this item.
- MWD Committee Restructuring – what does it mean to Sites? - Same with this item.

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2. Program Operation

1. Consultant 2023 billing rates -
2. 2022 Final Invoices/Expenses Due 1/20/23

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3. External Affairs

i.L&O moved to February 1st

i.LMC in late January

i.LCWG meeting January 19th

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4. Reservoir Operations

1. Initial results from Daily Ops Model expected at end of January
2. Jacobs is initiating analysis to see what could be stored this year
3. Continuing discussions about transition to storage-based investment and making room for Reclamation - Reclamation would like to be called a participant and not the word investor

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5. Engineering

1. FERC Qualifying Conduit update - working through quality assurance and get it back to FERC by the end of the month.
2. O&E Workgroup – Wednesday 1/11 - Baseline schedule.

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6. Plan of Finance

1. Follow up from Jan 4th Interested New Participants Meeting/forthcoming survey

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2. Indicative Rating/Project Overview Call with S&P on 1/18 – Presentation in development

3. Draft 2022 Annual Report with Agents for review (input requested by 1/16)

7. Geotech

- Geotech on hold due to weather/safety - TCCA has asked to hold off until we have 7 days of dry weather.

  - Conner to follow up with you today on flexibility on the delivery of water may not be as critical and might have some flexibility.

8. Environmental Planning & Permitting

1. Water Year Info
2. Water Right Application Status
3. Meetings with CDFW this week, WRLCM and Operations ITP Comments

9. Program Management -

1. No updates for Monday, 1/9/23

10. Project Controls -

1. No Update

11. Engineering & Construction

1. Reservoir Outlet optimization – a point of integration, rolling cost estimate consideration, impacts packaging

12. Administrative

- New RC alternates; Lillian Xie replaced Amparo Flores for Zone 7, Mike Urkov replaced Ken LaGrande for Lagrande WD and previously mentioned, Ali Elhassan for SCVWD
- Staff Reports and supporting documents due tomorrow, COB.

From: Micko, Steve [Steve.Micko@jacobs.com]
Sent: 1/9/2023 10:55:50 AM
To: Angela Bezzone [bezzone@mbkengineers.com]
CC: Alicia Forsythe [aforsythe@sitesproject.org]; Leaf, Rob [Rob.Leaf@jacobs.com]; Thayer, Reed [Reed.Thayer@jacobs.com]
Subject: NoD Activity Sensitivity Analyses
Attachments: SitesMetrics_rev34_5scn__ALT3B_041122_2035CT_SA_NOD.pdf

Hi Angela,

We've prepared two draft sensitivity analyses regarding NoD participant activity:

- Increase frequency and allowable volume of transfer to SoD participants
- Artificially increase demand of NoD participants

I attached a results summary pdf of Alt 3B and the two sensitivity analyses.

If my memory serves me correctly, these sensitivity analyses are to demonstrate the ability of Sites Reservoir to further "optimize" its activity.
With these runs, long-term average annual total release from NoD participants (release for NoD use AND transfers to SoD participants) increases (Table 1).
These changes to NoD operations have a negligible effect on the long-term average releases to SoD, Fed and State participants (Table 1).
As shown in Table 2, the activity of the North of Delta account increases, but has a small effect on total reservoir activity.

Please let me know if you have any questions.

Best,
Steve

Table 1. Long-term and Dry and Critically Dry Average Releases

Releases (TAF/year)
Releases for Authority PWA Deliveries - North of Delta
Assumed transfer from North of Delta to South of Delta
Releases for Authority PWA Deliveries - South of Delta
Releases for CVP Deliveries - Operational Flexibility

Releases for Refuge Water Supply
Releases for Yolo Bypass Habitat Water Supply
Total Releases

ALT 3B 041122 2035 CT	
Average	**Dry and Critical**
1.5 MAF Reservoir Dunnigan Pipeline (outlet to CBD) 2035 CT Climate	
27	42
7	4
119	240
58	54
21	32
40	13
271	**386**

ALT 3B 041122 2035 CT SA inc NOD dem[1]		**ALT 3B 041122 2035 CT SA SOD sale[2]**	
Average	**Dry and Critical**	**Average**	**Dry and Critical**
1.5 MAF Reservoir Dunnigan Pipeline (outlet to CBD) 2035 CT Climate		1.5 MAF Reservoir Dunnigan Pipeline (outlet to CBD) 2035 CT Climate	
32	48	26	40
7	4	11	6
118	238	117	243
57	53	58	54
21	32	22	33
40	12	40	13
275	**388**	**274**	**389**

Sensitivity analysis with increased demand for North of Delta participants

[2]Sensitivity analysis with increase in allowable transfers from North of Delta participants to South of Delta participants

Table 2. Ratio of Account Size to Long-term Average Annual Release

Account	Account Size (TAF)	Ratio of Account Size to Long-Term Average Release		
		Alt 3B 041122 2035CT	Alt 3B 041122 2035CT SA Inc NoD Demand[1]	Alt 3B 041122 2035CT SA SOD Sale[2]
NoD[3]	238	7.00	6.10	6.43
SoD	728	6.12	6.17	6.22
Federal	230	3.97	4.04	3.97
State	244	4.00	4.00	3.94
Total Active Storage	**1440**	**5.29**	**5.24**	**5.26**

[1]Sensitivity analysis with increased demand for North of Delta participants
[2]Sensitivity analysis with increase in allowable transfers from North of Delta participants to South of Delta participants
[3]Releases include transfers from NoD participants to SoD participants

Steve Micko, PE (he/him) | Jacobs | Project Manager and Water Group Leader
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CVP/SWP Deliveries Table

Deliveries (TAF/year) (change from No Project Alternative conditions) [a]	ALT 3B 041122 2035 CT		ALT 3B 041122 2035 CT SA inc NOD dem		ALT 3B 041122 2035 CT SA SOD sale	
	Average	**Dry and Critical**	**Average**	**Dry and Critical**	**Average**	**Dry and Critical**
	1.5 MAF Reservoir Dunnigan Pipeline (outlet to CBD) 2035 CT Climate		1.5 MAF Reservoir Dunnigan Pipeline (outlet to CBD) 2035 CT Climate		1.5 MAF Reservoir Dunnigan Pipeline (outlet to CBD) 2035 CT Climate	
CVP OpFlex Deliveries	**7**	**3**	**8**	**6**	**7**	**3**
NOD Ag	-1	3	-1	3	-1	3
NOD M&I	1	1	1	1	1	1
SOD Ag	7	-2	8	1	7	-2
SOD M&I	0	0	0	0	0	0
CVP Refuge Water Supply	**0**	**0**	**0**	**0**	**0**	**0**
NOD (Level 2)	0	0	0	0	0	0
SOD (Level 2)	0	-1	0	0	0	-1
SWP Deliveries	**14**	**-1**	**15**	**3**	**15**	**2**
SWP SOD Ag (Table A)	1	-1	2	1	2	0
SWP SOD M&I (Table A)	5	-2	6	1	5	1
SWP SOD Interruptible (Article 21)	8	1	7	1	9	1
Total change in CVP/SWP Deliveries	**22**	**2**	**22**	**9**	**22**	**5**

Notes:

[a] *Values shown are the net change between the Project Alternative and No Project Alternative*

Results are dependent on storage allocations (see storage allocation table)

Shasta Storage and Operations Table

Volumes (TAF/year) (change from No Project Alternative conditions) [a]	ALT 3B 041122 2035 CT		ALT 3B 041122 2035 CT SA inc NOD dem		ALT 3B 041122 2035 CT SA SOD sale	
	Average	Dry and Critical	Average	Dry and Critical	Average	Dry and Critical
	1.5 MAF Reservoir Dunnigan Pipeline (outlet to CBD) 2035 CT Climate		1.5 MAF Reservoir Dunnigan Pipeline (outlet to CBD) 2035 CT Climate		1.5 MAF Reservoir Dunnigan Pipeline (outlet to CBD) 2035 CT Climate	
Additional End of April Shasta Storage	**42**	**96**	**41**	**92**	**42**	**94**
CVP OpFlex Storage	43	93	41	90	42	92
Storage exchanged from Sites	0	2	0	2	0	2
Additional End of September Shasta Storage	**92**	**136**	**90**	**132**	**91**	**135**
CVP OpFlex Storage	85	131	82	127	84	129
Storage exchanged from Sites	7	5	8	5	7	5
Fall Flow Stability (Oct - Feb)	**20**	**7**	**19**	**8**	**20**	**7**
CVP OpFlex Fall Flow Stability	8	3	7	3	8	3
Exchange Fall Flow Stability	12	4	12	5	12	4
Spring Pulse Flow (Mar - May)	**26**	**5**	**26**	**5**	**26**	**5**
CVP OpFlex Spring Pulse Flow	-2	5	-2	5	-2	5
Exchange Spring Pulse Flow	28	0	28	0	28	0

Notes:

[a] Values shown are the net change between the Project Alternative and No Project Alternative

Results are dependent on storage allocations (see storage allocation table)

Authority Deliveries Table

Deliveries (TAF/year) (change from No Project Alternative conditions) [a]	ALT 3B 041122 2035 CT		ALT 3B 041122 2035 CT SA inc NOD dem		ALT 3B 041122 2035 CT SA SOD sale	
	Average	Dry and Critical	Average	Dry and Critical	Average	Dry and Critical
	1.5 MAF Reservoir Dunnigan Pipeline (outlet to CBD) 2035 CT Climate		1.5 MAF Reservoir Dunnigan Pipeline (outlet to CBD) 2035 CT Climate		1.5 MAF Reservoir Dunnigan Pipeline (outlet to CBD) 2035 CT Climate	
Authority PWA Deliveries	**115**	**240**	**120**	**246**	**116**	**242**
NOD	27	42	32	48	26	40
SOD	88	198	88	198	90	203
CVP Operational Flexibility	**7**	**3**	**8**	**6**	**7**	**3**
Sub-Total Supplemental Deliveries for Water Supply	**123**	**244**	**128**	**253**	**123**	**245**
Refuge Water Supply	**18**	**27**	**17**	**26**	**18**	**27**
NOD (Level 4)	4	5	4	5	4	5
SOD (Level 4)	13	21	13	21	14	22
Yolo Bypass Habitat Water Supply	**35**	**11**	**34**	**10**	**35**	**11**
Total Authority Deliveries	**175**	**282**	**180**	**289**	**176**	**283**
Percentage of Total Authority Deliveries						
Authority PWA Deliveries - North of Delta	15%	15%	18%	17%	15%	14%
Authority PWA Deliveries - South of Delta	50%	70%	49%	69%	51%	71%
CVP Deliveries - Operational Flexibility	4%	1%	4%	2%	4%	1%
Refuge Water Supply	10%	9%	10%	9%	10%	10%
Yolo Bypass Habitat Water Supply	20%	4%	19%	4%	20%	4%
Consideration of Incidental Change to CVP and SWP Deliveries						
Incidental Change to SWP Deliveries	14	-1	15	3	15	2
Total Authority, CVP OpFlex and SWP Deliveries	189	281	194	292	191	286
Incremental Change as a Percentage of Total Authority Deliveres	8%	0%	8%	1%	9%	1%
Incremental Change as a Percentage of Total Authority, CVP OpFlex and SWP Delivere	8%	0%	7%	1%	8%	1%

Notes:

[a] Values shown are the net change between the Project Alternative and No Project Alternative

Results are dependent on storage allocations (see storage allocation table)

Storage Table

Storage Increases (TAF) (above No Project Alternative conditions)[a]	ALT 3B 041122 2035 CT		ALT 3B 041122 2035 CT SA inc NOD dem		ALT 3B 041122 2035 CT SA SOD sale	
	Average	**Dry and Critical**	**Average**	**Dry and Critical**	**Average**	**Dry and Critical**
	1.5 MAF Reservoir Dunnigan Pipeline (outlet to CBD) 2035 CT Climate		1.5 MAF Reservoir Dunnigan Pipeline (outlet to CBD) 2035 CT Climate		1.5 MAF Reservoir Dunnigan Pipeline (outlet to CBD) 2035 CT Climate	
End-of-April						
Additional end-of-April storage	**38**	**89**	**37**	**84**	**37**	**86**
Trinity	0	0	0	0	0	0
Shasta	42	96	41	92	42	94
CVP OpFlex Storage	*43*	*93*	*41*	*90*	*42*	*92*
Storage exchanged from Sites	*0*	*2*	*0*	*2*	*0*	*2*
Oroville	-4	-9	-5	-10	-5	-10
SWP Storage	*-4*	*-9*	*-5*	*-10*	*-5*	*-10*
Sites Delta Participants Storage	*0*	*0*	*0*	*0*	*0*	*0*
Folsom (CVP OpFlex)	1	2	1	2	1	2
Percentage of Total Additional End-of-April Storage						
Portion of total additional end-of-April storage						
Trinity	0%	0%	0%	0%	0%	0%
Shasta	110%	108%	111%	109%	111%	110%
Oroville	-11%	-10%	-13%	-12%	-13%	-12%
Folsom	2%	2%	2%	2%	2%	2%
End-of-September						
Additional end-of-September storage	**104**	**152**	**101**	**148**	**103**	**148**
Trinity	0	0	0	0	0	0
Shasta	92	136	90	132	91	135
CVP OpFlex Storage	*85*	*131*	*82*	*127*	*84*	*129*
Storage exchanged from Sites	*7*	*5*	*8*	*5*	*7*	*5*
Oroville	10	14	9	13	10	11
SWP Storage	*-8*	*-10*	*-8*	*-11*	*-8*	*-13*
Sites Delta Participants Storage	*18*	*23*	*18*	*24*	*18*	*24*
Folsom (CVP OpFlex)	2	3	2	2	2	3
Percentage of Total Additional End-of-September Storage						
Portion of total additional end-of-September storage						
Trinity	0%	0%	0%	0%	0%	0%
Shasta	88%	89%	89%	89%	89%	91%
Oroville	10%	9%	9%	9%	10%	7%
Folsom	2%	2%	2%	2%	2%	2%

Notes:

[a] *Values shown are the net change between the Project Alternative and No Project Alternative*

Results are dependent on storage allocations (see storage allocation table)

Sites Releases Table

Releases (TAF/year)	ALT 3B 041122 2035 CT		ALT 3B 041122 2035 CT SA inc NOD dem		ALT 3B 041122 2035 CT SA SOD sale	
	Average	**Dry and Critical**	**Average**	**Dry and Critical**	**Average**	**Dry and Critical**
	1.5 MAF Reservoir Dunnigan Pipeline (outlet to CBD) 2035 CT Climate		1.5 MAF Reservoir Dunnigan Pipeline (outlet to CBD) 2035 CT Climate		1.5 MAF Reservoir Dunnigan Pipeline (outlet to CBD) 2035 CT Climate	
Releases for Authority PWA Deliveries - North of Delta	27	42	32	48	26	40
Assumed transfer from North of Delta to South of Delta	7	4	7	4	11	6
Releases for Authority PWA Deliveries - South of Delta	119	240	118	238	117	243
Releases for CVP Deliveries - Operational Flexibility	58	54	57	53	58	54
Releases for Refuge Water Supply	21	32	21	32	22	33
Releases for Yolo Bypass Habitat Water Supply	40	13	40	12	40	13
Total Releases	**271**	**386**	**275**	**388**	**274**	**389**
Percentage of Total Releases from Sites						
Releases for Authority PWA Deliveries - North of Delta	10%	11%	12%	12%	10%	10%
Assumed transfer from North of Delta to South of Delta	2%	1%	3%	1%	4%	2%
Releases for Authority PWA Deliveries - South of Delta	44%	62%	43%	61%	43%	63%
Releases for CVP Deliveries - Operational Flexibility	21%	14%	21%	14%	21%	14%
Releases for Refuge Water Supply	8%	8%	8%	8%	8%	9%
Releases for Yolo Bypass Habitat Water Supply	15%	3%	14%	3%	15%	3%

Notes:
Results are dependent on storage allocations (see storage allocation table)

Sites Fills Table

Fills (TAF/year)	ALT 3B 041122 2035 CT		ALT 3B 041122 2035 CT SA inc NOD dem		ALT 3B 041122 2035 CT SA SOD sale	
	Average	**Dry and Critical**	**Average**	**Dry and Critical**	**Average**	**Dry and Critical**
	1.5 MAF Reservoir Dunnigan Pipeline (outlet to CBD) 2035 CT Climate		1.5 MAF Reservoir Dunnigan Pipeline (outlet to CBD) 2035 CT Climate		1.5 MAF Reservoir Dunnigan Pipeline (outlet to CBD) 2035 CT Climate	
Fills for Authority PWA - North of Delta	39	16	44	17	42	18
Fills for Authority PWA - South of Delta	130	58	129	60	129	57
Fills for CVP Operational Flexibility	59	21	58	21	59	21
Fills for Refuge Water Supply	23	10	23	9	24	10
Fills for Yolo Bypass Habitat Water Supply	41	9	41	9	42	9
Total Fill	**292**	**115**	**295**	**116**	**295**	**115**
Percentage of Total Fills						
Fills for Authority PWA - North of Delta	13%	14%	15%	15%	14%	16%
Fills for Authority PWA - South of Delta	44%	51%	44%	52%	44%	49%
Fills for CVP Operational Flexibility	20%	19%	20%	18%	20%	18%
Fills for Refuge Water Supply	8%	8%	8%	8%	8%	8%
Fills for Yolo Bypass Habitat Water Supply	14%	8%	14%	8%	14%	8%

Notes:

Results are dependent on storage allocations (see storage allocation table)

Sites Storage Allocation Table

Storage Volumes (TAF)	ALT 3B 041122 2035 CT	ALT 3B 041122 2035 CT SA inc NOD dem	ALT 3B 041122 2035 CT SA SOD sale
	1.5 MAF Reservoir Dunnigan Pipeline (outlet to CBD) 2035 CT Climate	1.5 MAF Reservoir Dunnigan Pipeline (outlet to CBD) 2035 CT Climate	1.5 MAF Reservoir Dunnigan Pipeline (outlet to CBD) 2035 CT Climate
Authority PWA - North of Delta	238	238	238
TCCA	*126*	*126*	*126*
GCID	*29*	*29*	*29*
RD108	*25*	*25*	*25*
Other Sacramento Valley	*58*	*58*	*58*
Authority PWA - South of Delta	728	728	728
CVP Operational Flexibility	230	230	230
Refuge Water Supply	124	124	124
Yolo Bypass Habitat Water Supply	120	120	120
Dead Pool Storage	60	60	60
Total Storage	**1500**	**1500**	**1500**
Percentage of Total Storage Capacity			
Authority PWA - North of Delta	17%	17%	17%
Authority PWA - South of Delta	51%	51%	51%
CVP Operational Flexibility	16%	16%	16%
Refuge Water Supply	9%	9%	9%
Yolo Bypass Habitat Water Supply	8%	8%	8%

Notes:

Results are dependent on storage allocations

Ratios Table

Ratios	ALT 3B 041122 2035 CT			ALT 3B 041122 2035 CT SA inc NOD dem			ALT 3B 041122 2035 CT SA SOD sale		
	Releases/ Fills	**Deliveries/ Releases**	**Estimated Salinity Cost Factor**	**Releases/ Fills**	**Deliveries/ Releases**	**Estimated Salinity Cost Factor**	**Releases/ Fills**	**Deliveries/ Releases**	**Estimated Salinity Cost Factor**
Alternative Facilities	1.5 MAF Reservoir Dunnigan Pipeline (outlet to CBD)			1.5 MAF Reservoir Dunnigan Pipeline (outlet to CBD)			1.5 MAF Reservoir Dunnigan Pipeline (outlet to CBD)		
Ratios for Authority PWA Deliveries - North of Delta	69%	100%		73%	100%		62%	100%	
Ratios for Authority PWA Deliveries - South of Delta	96%	70%	30%	96%	71%	29%	99%	70%	30%
Ratios for CVP Deliveries - Operational Flexibility	99%	13%		99%	13%		99%	12%	
Ratios for Refuge Water Supply	91%	83%	17%	92%	83%	17%	92%	83%	17%
NOD		100%			100%			100%	
SOD		79%	21%		79%	21%		79%	21%
Ratios for Yolo Bypass Habitat Water Supply	97%	87%		97%	87%		97%	87%	
Overall	**93%**	**65%**		**93%**	**65%**		**93%**	**64%**	

Real Estate Team
Weekly Check-In – 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 Information:

Date:	January 9, 2023	**Location:**	Virtual – Microsoft Teams
Start Time:	2:00 p.m.	**Finish Time:**	3:00 p.m.
Purpose:	Real Estate Team – Weekly Check-In		

Meeting Participants:

Kevin Spesert	Jeff Mathews	Trishna Patel
Conner McDonald	Caitlin Nielsen	

Agenda:

Discussion Topic	Topic Leader
1. Overview and Opening Comments	Kevin
2. Field Work – Previous Weeks Recap a. Glenn County Roadways b. December 23 -- Funks Field Visit	Conner / All
3. Field Work – Current and Upcoming a. January -- Week of 1/16 or 1/23 -- Funks Pre-Investigation b. Below-Water-Line Work -- February 1 Cut-Off c. On-Land Work -- February	Conner / All
4. Landowner Engagement – Recap, Current Engagement, Look-Ahead a. Red Stick b. Wells Ranch c. Banyan -- Signed Agreement; County Permits; Conner working with John and Jelica for specific Environmental Scope, Schedule, Locations, Expectations; Eagle Permit still pending d. Owens	Conner / Jeff / All
5. Local Coordination – Recap, Current Engagement, Look-Ahead a. USBR / TCCA – Funks Coordinated with Don Babb – discussed weather, field conditions, schedule b. GCID Coordination – Geotech Work Package 2 c. County Permits – Borings – Environmental Health Department	Conner / Jeff / All

30 to 45 Days Colusa County – Banyan d. Local Community Working Group -- 1/19	
6. Right-of-Way Manual a. Conner and Jeff to be refining during Week of 1/9	Conner / Trishna
7. Project Team – Interdisciplinary Coordination a. Project Schedule Meeting – HC – In Planning b. Environmental Team – Tour – Water Board and USACE -- January 27; McDermott Road Turn-Out, Peterson Road, Funks c. Engineering Team -- HC -- Request to visit Funks while de-watered -- Mid to Late January -- during Geotech Field Work d. Geotech Reporting – JP Request from Participants – ACWA Jelica working with Marcus to create reporting e. Construction Traffic -- Truck Circulation e. Mitigation Team – Meeting – January 23 Brad scheduled to join Pre-Meeting – 11:00am – Tentative g. Land Survey - Field Work - Georeferenced Locations -- Sutton Road, Wadleigh Road, Maxwell-Sites, Old Highway 99, I-5 -- pending Controls approval -- Field Work in late Winter / early Spring?	Conner / All
8. Administrative a. Real Estate Policy - Compensation Protocol - Dozer Lines and Operational Impacts b. Discussion with Brad - Water Right; Roadways; Quarry / Borrow Areas	Conner
9. Open Discussion	All
10. Action-Item Recap	Caitlin
11. Next Steps	Kevin / Conner / All
12. Closing Thoughts	Kevin

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Number	Owner	County	Schedule Work Package 2-1/23 to 6/30/23
1	USA TCCA Government	Colusa	Work Package 2.01 - Start Timeframe of January 2023
2	GCID Canal APN, Owner Unknown	Colusa	Work Package 2.02 - Start Timeframe of February 2023
3	Owens, Glenn County	Glenn	Work Package 2.02 - Start Timeframe of February 2023
4	Banyan Transport Systems, Colusa County	Colusa	Work Package 2.03 - Start Timeframe of March 2023
5	Colusa County Road	Colusa	Work Package 2.03 - Start Timeframe of March 2023
6	Wells, Colusa County	Colusa	Work Package 2.06 - Start Timeframe of June 2023

Number	Owner	County	Schedule Work Package 3 - 7/1/23 to 12/31/23
1	Holthouse, Colusa County	Colusa	Work Package 3.07 - Start Timeframe of
3	Red Stick Farms, Colusa County	Colusa	Work Package 3.07 - Start Timeframe of
6	Cody Arnold, Colusa County	Colusa	Work Package 3.09 - Start Timeframe of
7	Jensen, Colusa County	Colusa	Work Package 3.09 - Start Timeframe of
8	GCID Canal APN, Owner Unknown	Colusa	Work Package 3.nov - Start Timeframe of
9	Mumma, Yolo County	Yolo	Work Package 3.x - Start Timeframe of
10	Tays Frank P & Marilyn E Family 15 Revoc Tr, Colusa County	Colusa	Work Package 3.x - Start Timeframe of
11	Todd M Hartill TBD, Red Stick, Colusa County 011-200-006 (011-200-013)	Colusa	Work Package 3.x - Start Timeframe of
12	USA TCCA Government	Yolo	Work Package 3.x - Start Timeframe of
13	Yolo County Bird Creek Drainage	Yolo	Work Package 3.x - Start Timeframe of

Number	Owner	County	Schedule Work Package 4-1/24 to 12/31/24
1	Aulman LLC, Yolo County	Yolo	Work Package 4 - Start Timeframe of
2	B&G Ranches, Colusa County	Colusa	Work Package 4 - Start Timeframe of
3	Brothers Doherty, Yolo County	Yolo	Work Package 4 - Start Timeframe of
4	Butler, Yolo County	Yolo	Work Package 4 - Start Timeframe of
5	C & H ORCHARDS III FARMING VENTURE LP, Yolo County	Yolo	Work Package 4 - Start Timeframe of
6	Christy Lee Snelgrove, Colusa County	Colusa	Work Package 4 - Start Timeframe of
7	Douglas Parker, Colusa County	Colusa	Work Package 4 - Start Timeframe of
8	Dunn Family Trust , Yolo County	Yolo	Work Package 4 - Start Timeframe of
9	Giutere Vineyard , Yolo County	Yolo	Work Package 4 - Start Timeframe of
10	Holthouse, Colusa County	Colusa	Work Package 4 - Start Timeframe of
11	Jensen, Colusa County	Colusa	Work Package 4 - Start Timeframe of
12	LaGrande, Brett, Glenn County	Glenn	Work Package 4 - Start Timeframe of
13	LaGrande, Colusa County	Colusa	Work Package 4 - Start Timeframe of
14	Mathis Family, Colusa County	Colusa	Work Package 4 - Start Timeframe of
15	Maureen Doherty, Colusa County	Colusa	Work Package 4 - Start Timeframe of
16	Morgan Twin Holdings LLC, Yolo County	Yolo	Work Package 4 - Start Timeframe of
17	MOUNTANOS TRUST / MICHAEL S MOUNTANOS TR & MORGAN TWIN HOLDINGS LLC ETAL / ATTN STEVE MORGAN, Yolo County	Yolo	Work Package 4 - Start Timeframe of
18	P Doherty, Yolo County	Yolo	Work Package 4 - Start Timeframe of
19	P Doherty, Yolo County	Yolo	Work Package 4 - Start Timeframe of
20	Richard Riolo, Yolo County	Yolo	Work Package 4 - Start Timeframe of
21	Ritchie Bros, Yolo County	Yolo	Work Package 4 - Start Timeframe of

Year Mitigation Required to be in Place

(KEY): 2025 2027 2028 2029 2031

New lines for Master Schedule (don't need colors for schedule – those are just to group construction activities into these 4 cycles):

Cycle 1 of Compensatory Mitigation	Dec 2025- June 2027
Cycle 2 of Compensatory Mitigation	Oct 2026 - March 2028
Cycle 3 of Compensatory Mitigation	Mar 2027 - March 2029
Cycle 4 of Compensatory Mitigation	Mar 2028 - Jun 2031

**All activities shown below are grouped by cycle#/year with corresponding color above and should show new Cycle task lines (above) as a predecessor.

Constr Schedule	Activity	Start Date
Line 265	Early Site Access and Staging Development	April 16, 2025
Line 298	Offsite Quarry Development	Aug 6, 2027
Line 271	North Constr Access Roads	June 11, 2027
Line 276	South Constr Access Roads	June 11, 2027
Line 286	Ancillary Roads	June 11, 2027
Line 291	Stone Corral Recreation Road to Sites Dam	June 11, 2027
Line 282	County Roads F, D, McDermott, Delevan	Sept 10, 2027
Line 296	Sites Ladoga Road Realign & Bridge	Jun 2, 2028
Line 300	Sites Dam - Filter material haul to stockpile	Jun 16, 2028
Line 303-305	Saddle Dam 3 (access, clearing, grubbing)	July 13, 2028
Line 323-325	Saddle Dam 5 (access, clearing, grubbing)	July 13, 2028
Line 344-346	Minor Saddle Dams (access, clearing, grubbing)	Apr 14, 2028
364-365	Saddle Dam 8B – Spillway (batch plant setup, foundation)	May 26, 2028
Line 377	Sites Dam Access/Staging	Jan 19, 2029
Line 383	Sites Diversion Outlet Facility (DOF) - Downstream Portal	Feb 9, 2029
Line 385	Sites DOF – Upstream Portal	Feb 9, 2029
Line 381	Sites Dam Foundation Excavation, Prep, Grouting	Mar 2, 2029
Line 371	SD 8B Bridge	Apr 10, 2029
Line 398-399	Sites Dam - Initial Borrow/Quarry Development	Jun 8, 2029

Line 384	Sites DOF - Tunnel Excavation & Lining	Jun 15, 2029
Line 400-403	Sites Dam - Place Material Zone 1-4	Dec 21, 2029
Line 386-387	Sites DOF – Inlet/Outlet Structures	Aug 9, 2030
Line 390	Sites DOF - Construct Cofferdam to El. 310	Mar 21, 2031
Line 408	Golden Gate Dam Access/Staging	Sept 16, 2031
Line 412	GG Dam Foundation Excavation	May 21, 2032
Line 413	GG Dam - Bypass Pipeline and U/S Cofferdam	Oct 8, 2032
Line 414	GG Dam - Foundation Preparation and Grouting	Oct 29, 2032
Line 420	GG Dam – Embankment	Jan 14, 2033
Line 430	Dams Startup and Commissioning	Jul 27, 2035

Mitigation Timing Assumptions (estimates do not have confirmation of market availability; will be assessed):

Years 2027 Due Dates (90-100% banking; all aquatic) – assume 18 months lead time – build 10% buffer [start contracting/RFP process in late-2023, assuming Authority support]

Years 2028 Due Dates (50-70% banking/turnkey) – assume 24-30 months lead time – keep 10% buffer [start identifying options late 2023, but begin contracting/agreement process by mid-2024]

Years 2029 and 2030 Due Dates (shift to large land purchase options) – assume 36 months lead time – progressively reducing buffer [start identifying options late 2023; RFPs/contracting/ permitting/ restoration design start by at least early 2027, as needed]

*this schedule assumes there will be incorporation of other compensatory mitigation requirements, as they relate to physical easements/acquisitions (i.e., Cultural, Tribal, AQ/GHG, Agriculture, etc); currently only links to compensatory mitigation for Sites reservoir biological (footprint) effects on species/habitat

Questions:

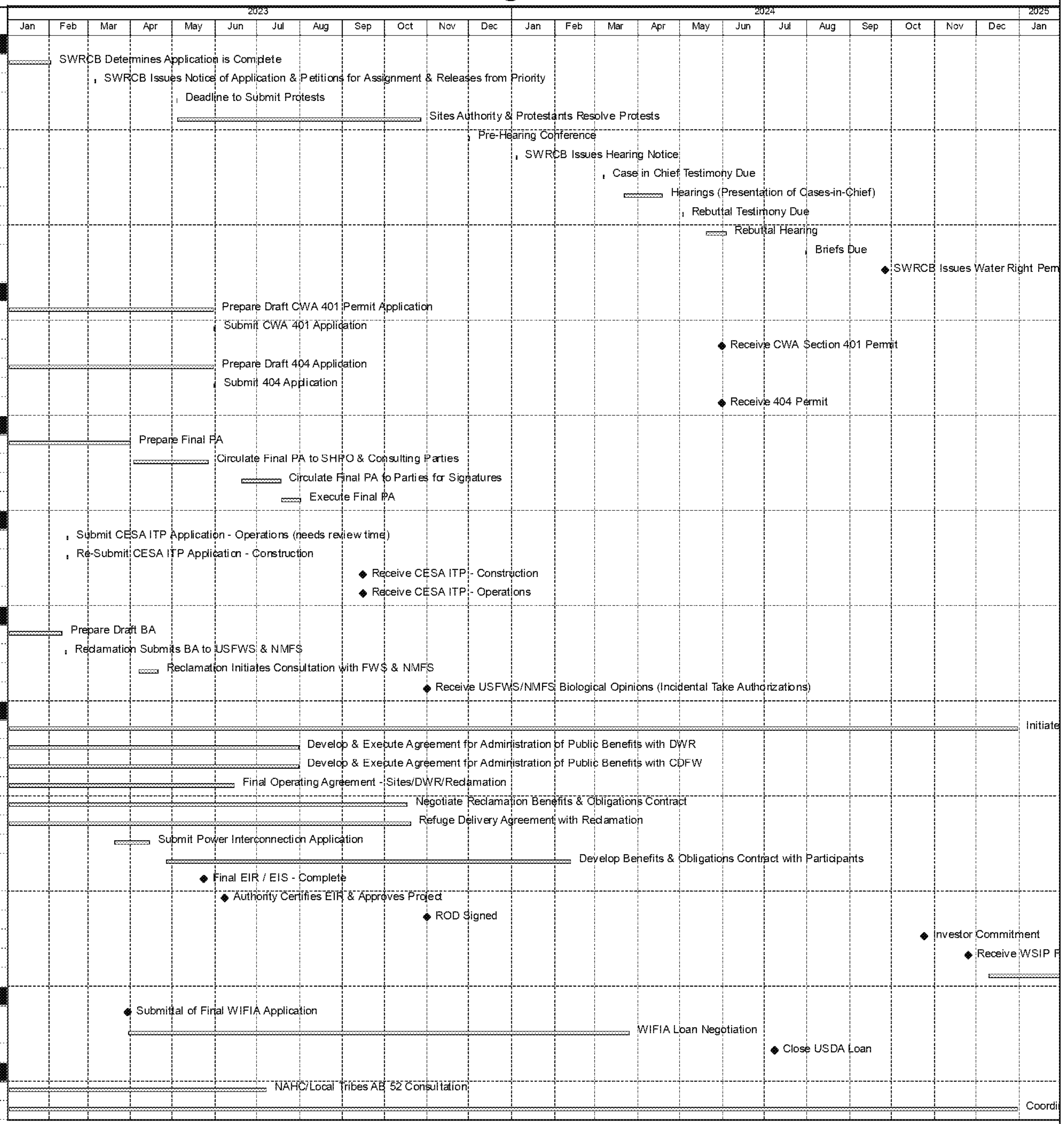
- Need to understand delineation of full area touched for each feature (including roads/utilities' install not separately scheduled that will have effects to be mitigated).
- Do all rows related to a single feature (i.e., Saddle Dam 5) touch exactly same footprint of disturbance, or what is biggest footprint activity to use for estimating acreage for task?
- Does Line 479 align with beginning of inundation of reservoir?
- Will need clarity on utility corridors construction or relocations – don't see on schedule (is on maps)
- Where is quarry development site (2026) and Sites Dam quarry development (2028) shown in annual maps or are they?
- Line 214 – will need to understand haul route and stockpile location referenced

Sites Reservoir Project

Coordination Activities with State and Federal Agencies

10-Jan-23

Activity Name	Start	Finish
Water Right Permit	**12-May-22**	**26-Sep-24**
SWRCB Determines Application is Complete	12-May-22	02-Feb-23
SWRCB Issues Notice of Application & Petitions for Assignment & Releases from Priority	06-Mar-23	06-Mar-23
Deadline to Submit Protests	04-May-23	04-May-23
Sites Authority & Protestants Resolve Protests	05-May-23	27-Oct-23
Pre-Hearing Conference	01-Dec-23	01-Dec-23
SWRCB Issues Hearing Notice	04-Jan-24	04-Jan-24
Case in Chief Testimony Due	07-Mar-24	07-Mar-24
Hearings (Presentation of Cases-in-Chief)	22-Mar-24	18-Apr-24
Rebuttal Testimony Due	03-May-24	03-May-24
Rebuttal Hearing	20-May-24	03-Jun-24
Briefs Due	31-Jul-24	31-Jul-24
SWRCB Issues Water Right Permit		26-Sep-24
Clean Water Act 401 & 404 Permits (SWRCB & USACE)	**04-Jan-21 A**	**31-May-24**
Prepare Draft CWA 401 Permit Application	04-Jan-21 A	30-May-23
Submit CWA 401 Application	31-May-23	31-May-23
Receive CWA Section 401 Permit		31-May-24
Prepare Draft 404 Application	04-Feb-21 A	30-May-23
Submit 404 Application	31-May-23	31-May-23
Receive 404 Permit		31-May-24
National Historic Preservation Act (NHPA)	**14-Mar-22 A**	**01-Aug-23**
Prepare Final PA	14-Mar-22 A	31-Mar-23
Circulate Final PA to SHPO & Consulting Parties	03-Apr-23	26-May-23
Circulate Final PA to Parties for Signatures	20-Jun-23	18-Jul-23
Execute Final PA	19-Jul-23	01-Aug-23
Incidental Take Permits (ITP's)	**14-Feb-23**	**15-Sep-23**
Submit CESA ITP Application - Operations (needs review time)	14-Feb-23	14-Feb-23
Re-Submit CESA ITP Application - Construction	14-Feb-23	14-Feb-23
Receive CESA ITP - Construction		15-Sep-23
Receive CESA ITP - Operations		15-Sep-23
Endangered Species Act Section 7	**11-Jan-21 A**	**31-Oct-23**
Prepare Draft BA	11-Jan-21 A	10-Feb-23
Reclamation Submits BA to USFWS & NMFS	13-Feb-23	13-Feb-23
Reclamation Initiates Consultation with FWS & NMFS	07-Apr-23	20-Apr-23
Receive USFWS/NMFS Biological Opinions (Incidental Take Authorizations)		31-Oct-23
Other Agreements & Benefits	**01-Feb-22 A**	**20-Feb-25**
Initiate Application for Permit to Construct from DSOD	01-Feb-22 A	30-Dec-24
Develop & Execute Agreement for Administration of Public Benefits with DWR	31-Mar-22 A	31-Jul-23
Develop & Execute Agreement for Administration of Public Benefits with CDFW	31-Mar-22 A	31-Jul-23
Final Operating Agreement - Sites/DWR/Reclamation	19-Apr-22 A	14-Jun-23
Negotiate Reclamation Benefits & Obligations Contract	16-Dec-22 A	17-Oct-23
Refuge Delivery Agreement with Reclamation	12-Dec-22 A	19-Oct-23
Submit Power Interconnection Application	20-Mar-23	14-Apr-23
Develop Benefits & Obligations Contract with Participants	27-Apr-23	12-Feb-24
Final EIR / EIS - Complete		23-May-23
Authority Certifies EIR & Approves Project		07-Jun-23
ROD Signed		31-Oct-23
Investor Commitment		24-Oct-24*
Receive WSIP Final Award from CWC		25-Nov-24
Participation Agreement: Home Board Execution & Final Rebalancing	10-Dec-24	20-Feb-25
Financing	**29-Mar-23**	**08-Jul-24**
Submittal of Final WIFIA Application		29-Mar-23
WIFIA Loan Negotiation	30-Mar-23	25-Mar-24
Close USDA Loan		08-Jul-24
Consultation, Coordination & Oversight	**01-Sep-20 A**	**30-Dec-24**
NAHC/Local Tribes AB 52 Consultation	01-Sep-20 A	07-Jul-23
Coordination & Oversight: DWR, WAPA, CAISO, UPRR, Caltrans	03-Jan-22 A	30-Dec-24



Stone Corral Creek and Funks Creek Aquatic Study Plan

December 19, 2022

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Contents

Tables

Figures

Acronyms and Abbreviations

°F	degrees Fahrenheit
ADCP	acoustic Doppler current profiler
AFDM	ash-free dry mass
Aquatic Study Plan	Stone Corral Creek and Funks Creeks Aquatic Study Plan
ASCI	Algae Stream Condition Index
Authority	Sites Project Authority
BMI	benthic macroinvertebrate
cfs	cubic feet per second
CDFW	California Department of Fish and Wildlife
CFGC	California Fish and Game Code
Chico ABL	Chico Aquatic Bioassessment Laboratory
CPUE	catch per unit effort
CSCI	California Stream Condition Index
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
GCID	Glenn-Colusa Irrigation District
GIS	geographic information system
GPS	global positioning system
LiDAR	light detection and ranging
MPSL-MLML	Marine Pollution Studies Laboratory at Moss Landing Marine Laboratories
Operations Plan	Stone Corral Creek and Funks Creek Operations Plan
PHAB	physical habitat
Project	Sites Reservoir Project
QA/QC	quality assurance/quality control
RBP	Rapid Bioassessment Protocol
REDEI/SDEIS	Revised Draft Environmental Impact Report/Supplemental Draft Environmental Impact Statement
SQL	Structured Query Language
SWAMP	Surface Water Ambient Monitoring Program
SWRCB	State Water Resources Control Board
TAF	thousand acre-feet
TC Canal	Tehama-Colusa Canal
TCCA	Tehama-Colusa Canal Authority
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

1.0 Introduction and Purpose

1.1 Introduction

This Stone Corral Creek and Funks Creek Aquatic Study Plan (Aquatic Study Plan) has been prepared for the Sites Project Authority (Authority) to guide fisheries technical studies to be conducted prior to and during operation of the Sites Reservoir Project (Project), as well as ongoing monitoring during Project operations, if necessary. The Project is a proposed offstream storage project located on the west side of the Sacramento Valley in Glenn and Colusa Counties, approximately 10 miles west of the community of Maxwell. It is designed to store unappropriated water from winter and spring storm events in the northern Sacramento River watershed. The Project would impound 1.5 million acre-feet of water in a reservoir. The reservoir would be created by building Sites Dam on Stone Corral Creek, Golden Gate Dam on Funks Creek, and a series of saddle dams on the northeastern rims of Antelope Valley. While a portion of naturally occurring seasonal flows in Stone Corral Creek and Funks Creek would be retained in the reservoir, the primary source of water for the reservoir would be diversions from the Sacramento River. These diversions would be up to 4,200 cubic feet per second (cfs) via two existing facilities: the Red Bluff fish screen and pumping plant (operated by the Tehama-Colusa Canal Authority [TCCA]) and the Glenn-Colusa Irrigation District's (GCID) fish screen and pumping plant near Hamilton City.

1.2 Purpose of Aquatic Study Plan

As part of the Project alternatives development, the Authority has committed in the Project's Revised Draft Environmental Impact Report/Supplemental Draft Environmental Impact Statement (RDEIR/SDEIS), as well as in the Project's application to appropriate water, to prepare this Aquatic Study Plan and conduct technical studies on Stone Corral Creek and Funks Creek in the reaches of interest (i.e., the stream reaches below the dams), as well as the downstream reaches. The Authority is proposing the following special water right term to be included in its water right permit.

Within 1 year of issuance of this permit and prior to impoundments to storage of flows from Stone Corral Creek and Funks Creek under this permit, Permittee shall finalize this draft Aquatic Study Plan in accordance with Section 2.5.2.1. and Appendix D, Section 2D.4 of the Project's RDEIR/SDEIS to guide studies in Stone Corral Creek and Funks Creek that shall be implemented prior to and during construction activities to collect information necessary to address California Fish and Game Code Section (CFGC) 5937. This Aquatic Study Plan includes an assessment of fish assemblage and available habitat, flow characteristics, water temperatures, bioassessment monitoring, and method for reporting data. This Aquatic Study Plan shall be finalized in consultation with the California Department of Fish and Wildlife (CDFW), the U.S. Fish and Wildlife Service (USFWS), and Colusa County. Permittee shall implement the Technical Studies Plan.

Using the results of the technical studies, within 5 years of issuance of this permit and prior to impoundments to storage of flows from Stone Corral Creek and Funks Creek under this permit, the Permittee shall develop a Stone Corral Creek and Funks Creek Operations Plan (Operations Plan) in accordance with Section 2.5.2.1. and Appendix D, Section 2D.4 of the RDEIR/SDEIS. The Authority is proposing the following special water right term to be included in its water right permit.

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[1] See Section 2.5.2.1. and Appendix D, Section 2D.4 of the RDEIR/SDEIS.

The Operations Plan shall describe Permittee's approach to address CFGC Section 5937 requirements, if any, resulting from impoundments to storage of flows from those creeks under this permit, while also ensuring that the Project's flood protection benefits are realized. The Operations Plan shall include, but may not be limited to, the approach for reservoir releases into Stone Corral Creek and Funks Creek, including release schedules and volumes and a monitoring plan. The Operations Plan shall be developed in consultation with CDFW, USFWS, and Colusa County, and approved by the Deputy Director for Water Rights.

Together, these studies would document the two creeks' existing hydrology, assess flow levels needed to maintain fluvial geomorphic processes, and update information on aquatic species presence and habitat use in the reaches downstream of the dams to establish aquatic baseline information that would be used to determine and subsequently manage environmental releases from the Project into the creeks. As part of the Aquatic Study Plan, studies would be initiated once access permission to the creeks through private property is obtained. The studies would also be used to inform final design for the proposed Sites Dam and Golden Gate Dam release facilities and operational requirements. The Aquatic Study Plan includes fish monitoring, a Surface Water Ambient Monitoring Program (SWAMP) bioassessment study, a hydrogeomorphic study, and a temperature study. Specific details for the field studies would be designed and conducted in collaboration with CDFW, USFWS and Colusa County.

The objectives of these studies are as follows.

- Determine existing fish assemblages in these creeks, including locations of fish species presence and habitat use.
- Characterize currently available habitats (e.g., spawning, rearing, foraging, and sheltering habitats) at varying flow levels, including the presence or absence of pools that persist through summer.
- Characterize flows, including assessing the baseflow during summer and conducting a fluvial geomorphologic study to characterize habitat conditions, substrate compositions, and flow levels.
- Conduct a SWAMP technical study (i.e., a stream bioassessment) that focuses on relationships between physical habitat (PHAB), water quality, and benthic macroinvertebrates.
- Implement hydrological studies to define flow temperature relationships.

This Aquatic Study Plan summarizes the methods and reporting strategies for the reaches downstream of the proposed impoundments on Stone Corral Creek and Funks Creek. Using information obtained from these field studies, along with currently available information, the Authority would develop a schedule of releases for Stone Corral Creek and Funks Creek to be incorporated into the Operations Plan. Flow releases into these creeks would be made to maintain flood control benefits of the Project and would not overtop streambanks or flood downstream areas. The release schedule would also account for meeting demands of senior water right holders on Stone Corral Creek and Funks Creek consistent with the timing of the existing water right that are downstream from the proposed dams. Appendix 2D, *Best Management Practices, Management Plans, and Technical Studies* of the *Sites Reservoir Project Revised Draft Environmental Impact Report/Supplemental Draft Environmental Impact Statement* (Sites Project Authority and Bureau of Reclamation 2021) describes the purpose, objectives, content, and timing of the field studies identified above.

Furthermore, if flows in Stone Corral Creek and Funks Creek are needed to maintain fish in good condition in compliance with CFGC Section 5937, then the Authority would adapt this study program into an operations monitoring program with a duration of 5 to 10 years to document and adaptively manage the timing and magnitude of flow releases to maintain fish in good condition below the dams along with the habitats upon which they depend. Performance standards would be developed in conjunction with the Authority and the relevant agencies (CDFW, USFWS, and Colusa County) prior to the start of operations monitoring.

1.2.1 Integration of Fish Monitoring with Aquatic Habitat Survey Methods

Aquatic habitat survey methods for sampling are described below. Note that the field observations and results from other studies (i.e., the stream bioassessment study and hydrogeomorphic study) would aid in the assessment of aquatic habitat and are referenced where applicable.

An initial reconnaissance survey would provide information on existing habitat and inform the selection of sampling stations within the Stone Corral Creek and Funks Creek drainages. Stations would initially be set at fixed distances apart to accommodate between 10 and 15 sampling stations within each drainage. Stations would be mapped prior to going into the field and then field-verified during the reconnaissance survey. Some leeway would be given to adjust locations to prioritize reaches containing optimal fish habitat and final locations would be discussed with CDFW and Colusa County to ensure appropriate placement. Stations that fell within dry or sub-optimal aquatic habitat for fish survival would be de-prioritized or curtailed.

As part of the pre-operation sampling for fish community and aquatic habitat, the following data would be collected and/or integrated into the fish study.

- **Fish community.** Surveys would characterize local fish communities using methods described below. As feasible and appropriate, methods would be consistent with those used in previous and ongoing fish community survey efforts (e.g., methods accepted as standard practice for sampling aquatic systems; Meador et al. 1993). (Fish Study)
- **Substrate composition.** Surveys would document stream bed substrate particle size using Wolman pebble counts (Wolman 1954; Kondolf and Li 1992), gravelometer, substrate facies mapping, or similar methods. (Hydrogeomorphic Study)
- **Riparian vegetation cover.** Surveys would measure the relative amount (e.g., percent cover) of riparian vegetation cover over aquatic habitat to document conditions. Riparian vegetation cover would be monitored using the California Rapid Assessment Method (Brown 2013), or similar method. (Hydrogeomorphic Study)
- **Benthic macroinvertebrate presence.** To better understand the entire aquatic community currently present in these creeks, an SWAMP bioassessment that focuses on the relationships between PHAB, water quality, benthic macroinvertebrates, and algal communities would be conducted on the reaches downstream of the proposed impoundments on Stone Corral Creek and Funks Creek. The bioassessment study would be conducted using the methods described in the SWRCB's SWAMP protocols (Ode et al. 2016a, 2016b). (SWAMP Bioassessment Study)
- **Water quality.** Monitoring for general water quality parameters (e.g., temperature, turbidity, pH, conductivity, salinity, and dissolved oxygen would be conducted to assess surface water quality. Water quality monitoring would be conducted using methods described in the State Water Board's SWAMP protocols (Ode et al. 2016a, 2016b). (SWAMP Bioassessment Study and Fish Study)
- **Water temperature.** Water temperature profiles for Stone Corral Creek and Funks Creek would be developed. These water temperature profiles would be used to inform decisions about which tiers of the inlet/outlet (I/O) tower to use when conducting releases into Funks Creek and intake levels for the release to Stone Corral Creek. The goal would be to mimic existing temperature profiles in Funks Creek.

1.3 Applicable Methods for Determining Operational Streamflows

After baseline hydrogeomorphic conditions are obtained and evaluated in context with the studies from other disciplines (i.e., Fish Assemblage Study and SWAMP Bioassessment Study), various approaches for estimation of minimum streamflows to maintain ecosystem and geomorphic function would be reviewed, such as “the functional flow” approach suggested by Yarnell et al. (2015), the Instream Flow Incremental Methodology (National Biological Service, U.S. Department of the Interior 1995), the CDFW Instream Flow Program,[2] the California Environmental Flows Framework,[3] and the Richter et al. (2011) approach. These methods would be investigated for their applicability to determine appropriate streamflows on Stone Corral Creek and Funks Creek to maintain fish in good condition. Coordination with CDFW, USFWS, and Colusa County would be required before a method is selected.

[2] https://wildlife.ca.gov/Conservation/Watersheds/Instream-Flow

[3] https://ceff.ucdavis.edu/

2.0 Environmental Setting

2.1 Environmental Setting of Stone Corral Creek and Funks Creek

Stone Corral Creek and Funks Creek are both small watersheds originating below the snowline on the eastern foothills of the California Coast Range at elevations of 700 to 850 feet. Consequently, they do not receive cold snowmelt water. Rather, they respond rapidly to significant rainfall events and flow intermittently, mostly during winter and early spring. From their origins, they flow through low foothills, across Antelope Valley (the proposed location of Sites Reservoir), through a series of shallow canyons and eventually spill onto the Sacramento Valley floor (Figure 1). For much of their course on the valley floor, they are confined to narrow channels between berms along the edge of agricultural fields and road prisms. While the stream channels of these creeks are not actively managed, their straight alignment and angular turns around agricultural fields and along roads indicate that they were modified from their natural historic channels. In the upper parts of the watersheds just above the dam locations, these streams are largely devoid of riparian cover resulting from livestock use (Bureau of Reclamation and California Department of Water Resources 2008:3-20). In the lower reaches where the streams run through and around agricultural fields, shaded riparian habitat is sparse and consists mostly of low shrubs, grasses, occasional oaks[4] (*Quercus* sp.), willows (*Salix* sp.), and cottonwood (*Populus* sp.) trees.

2.1.1 Stone Corral Creek

Stone Corral Creek has a drainage area of 38 square miles upstream of the proposed Sites Dam. From the proposed location of the Sites Dam, Stone Corral Creek meanders through a shallow canyon onto the valley floor, where it flows through an incised channel across grazing lands. At 4.6 miles from the Sites Dam location, Stone Corral Creek crosses over a siphon in the Tehama-Colusa Canal (TC Canal) and begins to travel through agricultural lands. About 3 miles below the TC Canal siphon, Stone Corral Creek crosses the GCID Main Canal. Although most of the water in the canal passes under Stone Corral Creek in a siphon, GCID releases water from the canal into Stone Corral Creek for delivery to agricultural fields downstream. About 5.5 miles below the GCID Main Canal, Funks Creek flows into Stone Corral Creek, and then Stone Corral Creek flows an additional 5 miles to the Colusa Basin Drain. Figure 2 shows these various elements.

The U.S. Geological Survey (USGS) collected 27 years of discharge measurements at USGS Gage No. 11390672, in Stone Corral Creek near the community of Sites, California, from 1958 through 1985 (Figure 3). The data demonstrate a high variability of flow over the period of record, and there were 3 years of zero flow: 1972, 1976, and 1977 (Figure 4). Yates (1989) estimated the recurrence interval of a winter without flow at 12 to 14 years. The maximum annual discharge during the period of record was 39.9 thousand acre-feet (TAF) in 1983. Based on the USGS period of record, mean annual daily discharge for the period of record was calculated as 9.02 cfs (SD of 67.5, median is 0) and annual average discharge was 6.5 TAF per year.

[4] According to Colusa County, there are no oaks east of Mills Orchard Road east of Stone Corral Creek nor approximately east of Funks Reservoir.

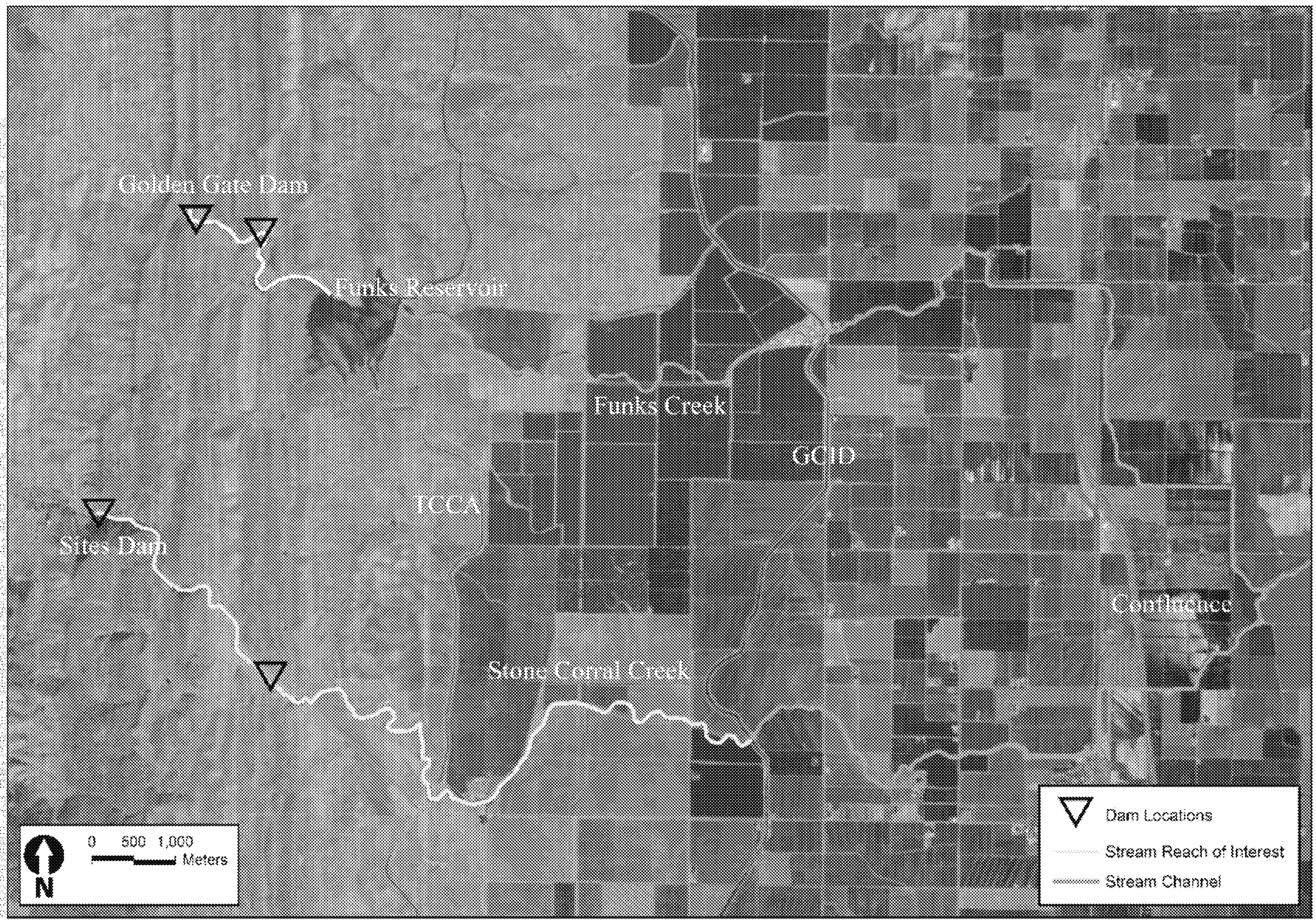

Figure 1. Stone Corral Creek and Funks Creek Reaches of Interest and Downstream Reaches

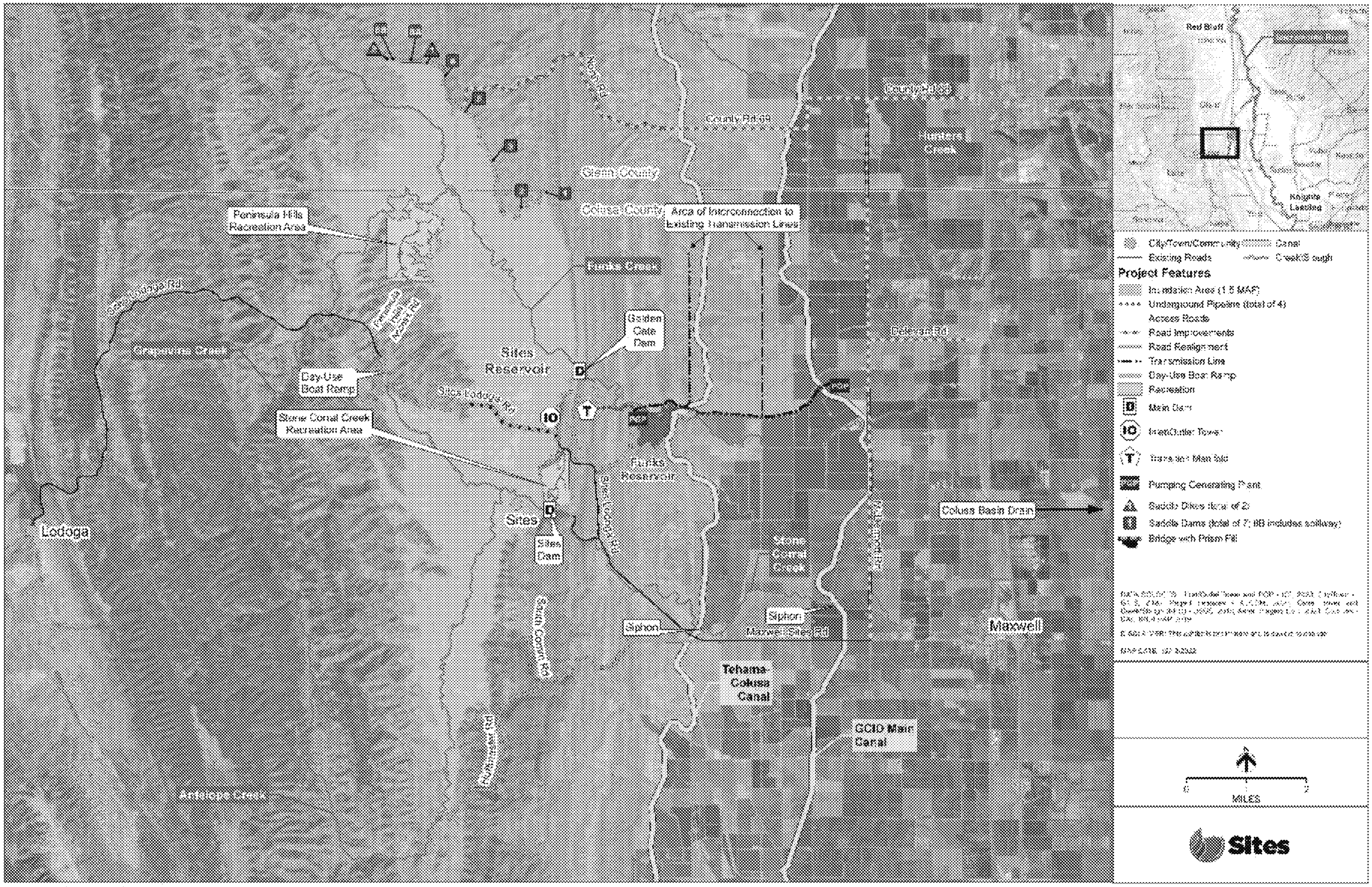

Figure 2. Project Area Overview

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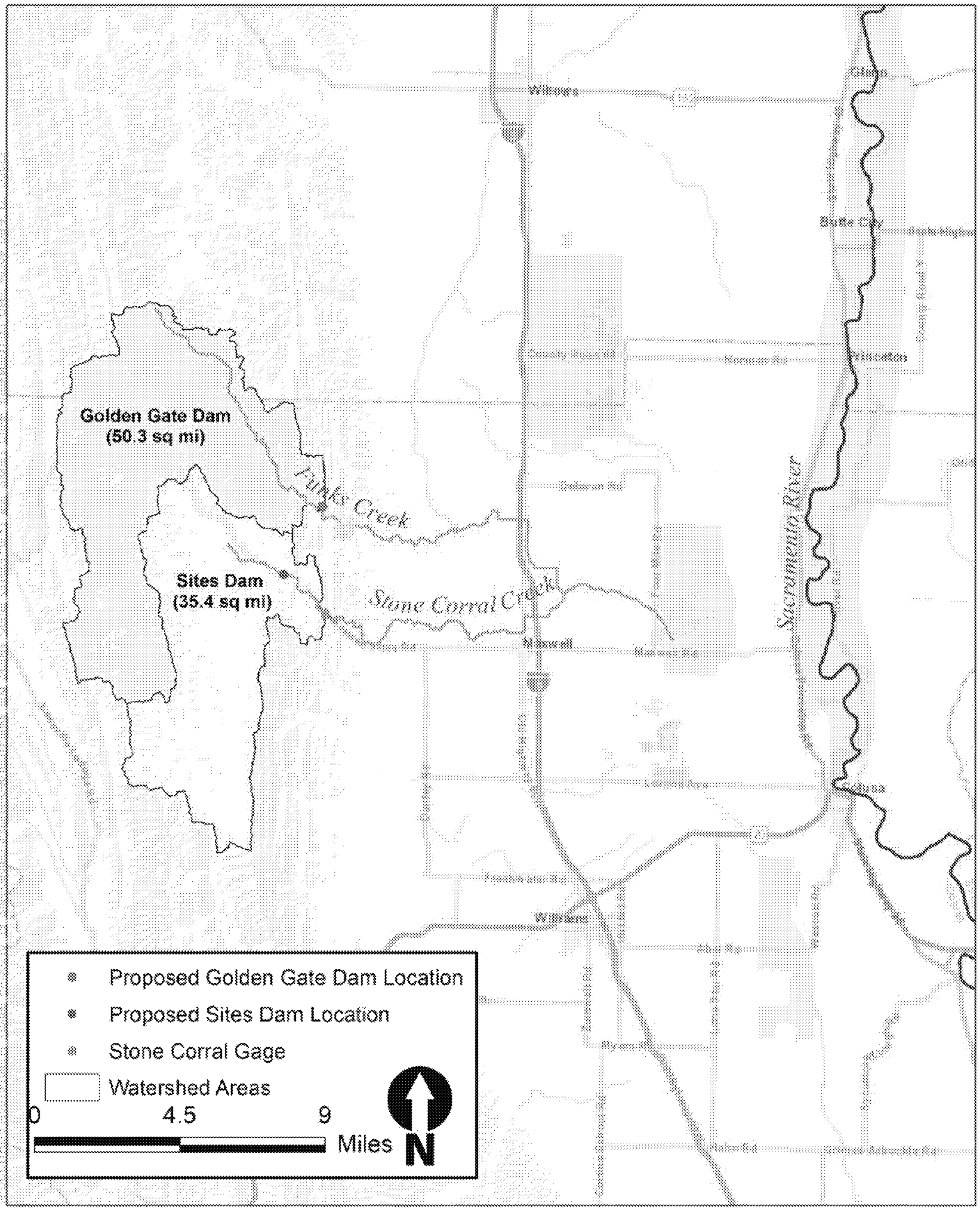
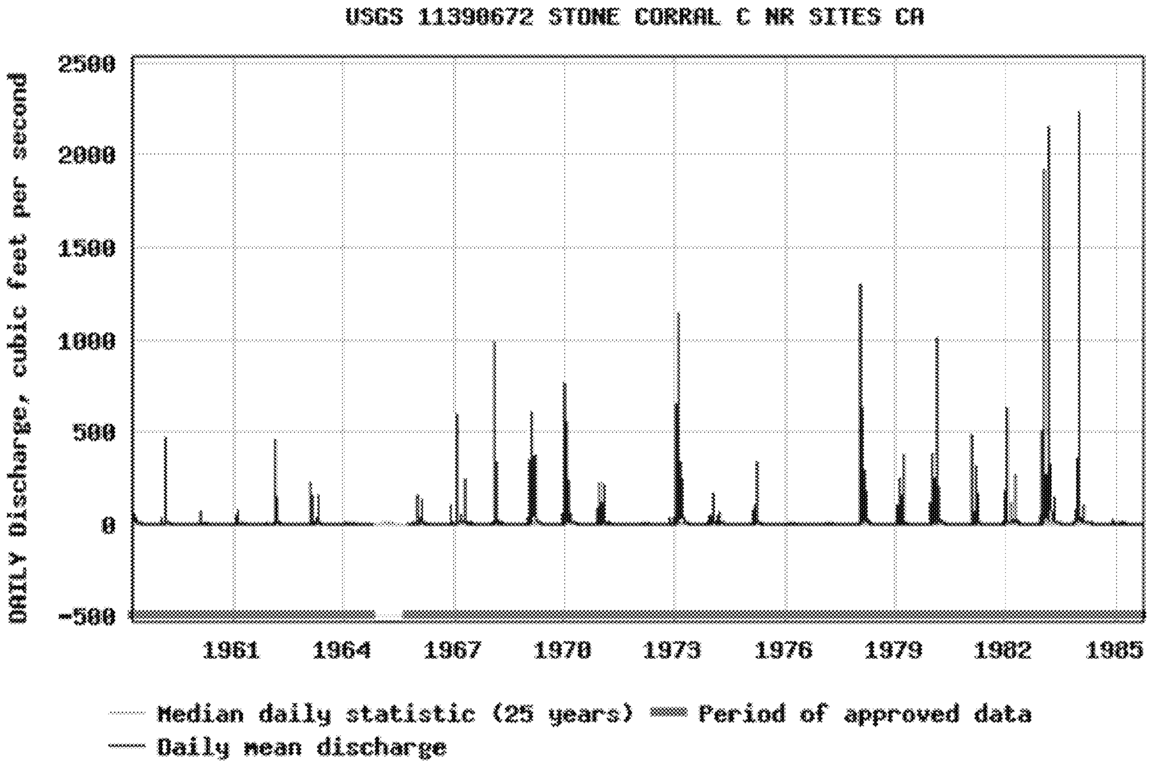


Figure 3. Stone Corral Creek and Funks Creek Watersheds Upstream of Proposed Sites Dam and Golden Gate Dam Locations. The Stone Corral Creek Gage Location captures the entire Sites Dam watershed (35.4 sq mi) upstream.



Source: U.S. Geological Survey stream gage 11390672

Figure 4. Mean Daily Flow in Stone Corral Creek near Sites (cfs)

Because the historical gage record for Stone Corral Creek is limited and Funks Creek is not gaged, historical stream gage data from Elder Creek was used to produce a longer-term estimate of streamflow on Stone Corral Creek and Funks Creek. The Elder Creek gage was chosen because it was the nearest gage on the valley floor with a long record of data available. It was assumed that Elder Creek has relatively similar precipitation and runoff patterns to Stone Corral Creek and Funks Creek. The streamflow of Elder Creek, located in Tehama County, has been measured since 1948 (USGS Gage No. 11379500). The gage site is approximately 49 miles northwest of the proposed Sites Reservoir, and has a drainage area upstream of the gage of 92.4 square miles (Attachment 1- MBK Engineers 2022). The overlapping period of gage records for Stone Corral Creek and Elder Creek (1958–1985) was used to determine a logarithmic correlation between the two gages for each month of the year. The developed streamflow timeseries was then further adjusted to account for the difference in watershed areas upstream of the old USGS Stone Corral Creek gage and the proposed location of Sites Dam. Tables 1a and 1b provide the results of this analysis, which shows the average monthly flow volume in acre-feet per year and cubic feet per second for each water year type (MBK Engineers 2022). The average monthly volumes are calculated using the gage record for October 1958 through August 1985 with logarithmic monthly correlations for September 1985 through September 2021. Results are summarized by Sacramento Valley Water Year Type: wet, above normal, below normal, dry, and critical.

Table 1a. Stone Corral Creek at Proposed Sites Dam Average Monthly Flow Volume (ac-ft) by Water Year Type (1958–2021)

Month	Wet	Above Normal	Below Normal	Dry	Critical	Average of All Years
Oct	0	0	0	0	0	0
Nov	42	11	2	5	0	17
Dec	872	242	29	47	54	336
Jan	3,365	2,825	711	345	171	1,663
Feb	4,487	4,667	1,283	135	307	2,317
Mar	2,135	1,522	407	264	179	1,039
Apr	901	319	114	25	35	375
May	136	119	15	7	9	65
Jun	20	8	2	1	1	8
Jul	1	0	0	0	0	0
Aug	0	0	0	0	0	0
Sep	0	0	0	0	0	0
WY Total	11,959	9,713	2,562	828	757	5,827

Table 1b. Stone Corral Creek at Proposed Sites Dam Average Monthly Flow Volume (cfs) by Water Year Type (1958–2021)

Month	Wet	Above Normal	Below Normal	Dry	Critical	Average of All Years
Oct	0	0	0	0	0	0
Nov	21	6	1	3	0	9
Dec	436	121	15	24	27	168
Jan	1,683	1,413	356	173	86	832
Feb	2,244	2,334	642	68	154	1,159
Mar	1,068	761	204	132	90	520
Apr	451	160	57	13	18	188
May	68	60	8	4	5	33
Jun	10	4	1	1	1	4
Jul	1	0	0	0	0	0
Aug	0	0	0	0	0	0
Sep	0	0	0	0	0	0
WY Total	5,980	4,857	1,282	415	378	2,910

2.1.2 Funks Creek

Funks Creek, a tributary to Stone Corral Creek, has a drainage area of 50.3 square miles upstream of the proposed Golden Gate Dam. From the proposed location of Golden Gate Dam, Funks Creek meanders through a series of low ridges and grazing lands for about 1.8 miles to Funks Reservoir. Funks Reservoir is a re-regulating reservoir on the TC Canal and is created by a low dam on Funks Creek. Funks Dam is operated by TCCA to manage water levels within the TC Canal. The Funks Dam gates are opened during large storm events to pass flood waters through Funks Reservoir and down Funks Creek to avoid compromising the TC Canal and its operations. With the exception of passing flood waters, the Funks Dam gates are operated in the closed position, but seepage through the dam gates maintains perennial flow for a short distance below the dam in Funks Creek.

Below Funks Dam, Funks Creek travels 3.9 miles through agricultural fields in a combination of natural and straightened channels to where it crosses the GCID Main Canal. While the GCID Main Canal passes under Funks Creek in a siphon, GCID releases water from the canal to Funks Creek. Similar to Stone Corral Creek, GCID uses the downstream portions of Funks Creek as part of its conveyance system to deliver water to agricultural fields. Approximately 2 miles northeast of Maxwell and 1 mile east of Interstate 5, Funks Creek flows into Stone Corral Creek.

There is no flow record for Funks Creek, but given the comparable size, geology, and topography of the two watersheds and their proximity to each other, Funks Creek seasonal flow patterns and flow magnitudes are likely similar to Stone Corral Creek.

The same correlation approach used to estimate streamflow in Stone Corral Creek cannot be followed to estimate streamflow in Funks Creek because there are no streamflow data available for Funks Creek. Therefore, flow in Funks Creek was estimated by prorating monthly Stone Corral Creek streamflow data by the ratio of Stone Corral Creek's and Funks Creek's watershed areas upstream of the proposed dam locations (MBK Engineers 2022). Tables 2a and 2b provide the results of this analysis and identify the average monthly flow volume in acre feet per year and cubic feet per second for each water year type.

Table 2a. Funks Creek Average Monthly Flow Volume (ac-ft) by Water Year Type (1958–2021)

Month	Wet	Above Normal	Below Normal	Dry	Critical	Average of All Years
Oct	0	0	0	0	0	0
Nov	60	16	3	7	1	24
Dec	1,239	343	41	66	77	485
Jan	4,778	4,011	1,010	489	243	2,362
Feb	6,372	6,628	1,822	192	436	3,290
Mar	3,031	2,161	578	375	255	1,475
Apr	1,280	453	162	36	49	553
May	193	169	21	9	13	93
Jun	28	11	2	1	2	12
Jul	2	0	0	0	0	1
Aug	0	0	0	0	0	0
Sep	0	0	0	0	0	0
WY Total	16,984	13,793	3,638	1,176	1,075	8,275

Table 2b. Funks Creek Average Monthly Flow Volume (cfs) by Water Year Type (1958–2021)

Month	Wet	Above Normal	Below Normal	Dry	Critical	Average of All Years
Oct	0	0	0	0	0	0
Nov	30	8	2	4	1	12
Dec	620	172	21	33	39	243
Jan	2,389	2,006	505	245	122	1,181
Feb	3,186	3,314	911	96	218	1,645
Mar	1,516	1,081	289	188	128	738
Apr	640	227	81	18	25	277
May	97	85	11	5	7	47
Jun	14	6	1	1	1	6
Jul	1	0	0	0	0	1
Aug	0	0	0	0	0	0
Sep	0	0	0	0	0	0
WY Total	8,492	6,896	1,820	588	538	4,148

2.1.3 Physical Characteristics

The only drainages that exit Antelope Valley are Stone Corral Creek and Funks Creek. Each creek continues through the steeper, foothill environments and then transitions to the Sacramento Valley floor, where each is generally shallow and highly altered, primarily for water conveyance and agricultural purposes. Straight channels and angular turns associated with agricultural fields and roads indicate that natural channels have been at least partially modified. Along their reaches on the valley floor, these creeks are mostly confined to narrow channels between berms adjacent to agricultural fields and road prisms.

Stone Corral Creek and Funks Creek are largely devoid of riparian habitat in their upper reaches (foothill environments) due to heavy livestock use. In the lower reaches where the creeks run through and around agricultural fields, riparian habitat is variable and consists mostly of low shrubs, grasses, occasional oak, willows and cottonwood trees; however, some segments of Stone Corral Creek possess dense stands of mature riparian vegetation.

Although the reaches of interest have been modified by livestock grazing, channelization, irrigation conveyance systems and minor diversions, they are still expected to have available aquatic habitat (i.e., benthic macroinvertebrate [BMI]). They also both experience much of their natural hydrograph (albeit altered due to local conveyance) and fluvial geomorphic processes and provide water and sediment that ultimately flows into the Colusa Basin Drain during rain events.

3.0 Fish Monitoring

3.1 Purpose of Fish Monitoring Program

The purpose of a fish monitoring program in Stone Corral Creek and Funks Creek downstream of Sites Reservoir is to establish a pre-project baseline and post-operation assessment of the fish species present to determine the existing state of the fish population and whether it is maintained in good condition consistent with CFGC Section 5937 after project construction and operation.

3.2 Overview of Proposed Methods

Assessment of the goal to maintain fish in good condition in these ephemeral creeks consistent with CFGC Section 5937 would be made using a Before-After-Control-Impact experimental study design, using the reach with perennial flow below Funks Reservoir as a control. Sampling would be conducted to assess fish community and habitat present in the study area for up to 5 years prior to operation of the Project. Following completion of the pre-operation survey, fish communities and aquatic habitats in the study area would be monitored in a similar fashion for a 5-to-10-year period after the Project is operational. Fish community and habitat data that showed statistically significant negative departures from baseline data would trigger reassessment of downstream flow management under a proposed adaptive management plan.

3.2.1 Pre-operation Baseline Monitoring

Pre-operation baseline monitoring would be conducted within the study area to identify, quantify, and map habitats (Chapter 4, *SWAMP Bioassessment Study Designs and Methodology*), document aquatic species distribution and population characteristics (e.g., relative abundance, diversity), and identify triggers (e.g., decrease in relative abundance) for adaptive management actions. This monitoring establishes a baseline condition from which success criteria are measured and includes initial reconnaissance and pre-operation sampling.

The pre-operation surveys would first involve a reconnaissance survey to observe and record variables that may affect sampling efforts and establish monitoring stations. Data collection would include information about the site, habitat, and fauna that are observed during site visits. Aquatic habitat and fish species sampling would be conducted once the reconnaissance is complete and sampling stations have been established. Data would be collected via standardized electronic or paper forms by experienced biologists during assessments and sampling. Data collected as part of pre-operation efforts would be summarized into yearly reports and a final pre-operation baseline report to the Authority at the end of the pre-operation survey period. Surveys would provide the information required to characterize baseline conditions of the fisheries resources, as well as threats and stressors to fish species and habitat in the pre-operation conditions.

3.2.2 Operations Monitoring

Operations monitoring would occur periodically at the intervals specified herein. Operations sampling would document fish abundance, condition, and distribution and compare the results with data collected on habitat area, location, and climate-driven changes in habitat characteristics over time. Data from the fish study would be used in documenting compliance with CFGC Section 5937 with data from the SWAMP assessments providing additional details on overall stream status.

Operations sampling methods would be identical to the pre-operation sampling, including returning to established stations and tracking fish abundance, diversity, and distribution through time. Threats and stressors identified in the pre-operation survey would be assessed during operations surveys to differentiate changes in habitat or fish communities not related to the operation of the Project. Data collected as part of the operations sampling effort would be compared against the baseline data, as well as previous years' data and summarized into interim and final reports.

3.2.3 Fish Sampling Methods

Beach Seining

Seining is a low cost, low impact method for capturing aquatic organisms. The size of the seines used for sampling would depend on the size of the habitat being sampled. Larger seines may be up to 30 feet long, 6 feet high, with a mesh size of 0.25 inch and a pocket size of 5 feet by 5 feet. Smaller seines used for small pools and ponds may be 12 feet long, 4 feet high, with a mesh size of 3/16 inch and a pocket that is 5 feet by 5 feet. Seines would be used or deployed in conjunction with block nets to prevent fish from moving out of the area prior to being sampled. Captured specimens would be held in floating net pens or large aerated containers, based on site conditions, prior to being processed. Specimens would be identified to species, and the first 20 of each species would be measured for fork length to the nearest millimeter before being released at the capture site. Additional specimens would be tallied and released. Representative specimens would be photographed for positive identification.

Circumstances that may affect efficacy include the amount or type of benthic structure, presence/absence of aquatic vegetation, water clarity, flow rate, and water depth. Seining is most effective in smooth bottom habitats free of aquatic debris or vegetation, with elevated turbidity, and are shallow enough for biologists to wade in. When benthic structure is complex, water clarity is high, and habitats contain extremely deep, shallow, or rapidly moving water that may exclude biologists from deploying nets, efficacy is dramatically decreased.

Seines with a "bag" to minimize aquatic organism handling stress are preferred. Seines with a bag are also preferred where obstructions make access to the water (or deployment/retrieval of the seine) difficult (U.S. Fish and Wildlife Service 2012). Blocking nets typically improve efficacy by reducing opportunities for target species to move out of the area being seined. Where the area to be isolated for sampling includes culverts, deep pools, undercut banks, or other cover attractive to fish (e.g., thick overhanging vegetation, root wads, logjams) it may be appropriate to isolate a portion or portions of the study area in phases, rather than attempting to herd fish from the entirety of the work area in a single downstream pass.

Electrofishing with Block Nets

Previous work in Stone Corral Creek and Funks Creek indicates that total dissolved solids are high enough to prevent the use of electrofishing as a means of sampling (California Department of Fish and Game and California Department of Water Resources 2000). During reconnaissance surveys, basic water quality measurements would be taken to confirm this observation. If total dissolved solids values are above levels known to interfere with electrofishing, the method would be curtailed in favor of seining. If employed, electrofishing would be done with a Smith-Root type backpack electrofisher. Sections of creeks would be isolated using blocking nets before biologists wade into them, starting from the upstream net and moving downstream. Captured specimens would be held in buckets, floating net pens, or large aerated containers prior to being identified and measured as above for seine sampling. Effort would be calculated using shock time. If fish exhibit signs of stress, including symptoms of tetany or bruising, electrofisher settings would be adjusted accordingly to reduce impacts.

Visual Surveys

Any visual observations by biologists during reconnaissance and sampling of stream fauna would be systematically recorded based on pre-determined reach locations. This would include documenting amphibians and reptiles that may be observed incidentally during fish sampling efforts.

General Water Quality

Water quality data would be measured at every fish sampling location using a YSI Pro DSS unit (or similar collection device), following Chapter 3 of the 2016 version of the SWAMP *Standard Operating Procedures for the Collection of Field Data for Bioassessments of California Wadeable Streams: Benthic Macroinvertebrates, Algae, and Physical Habitat* (SWAMP 2016 SOP) (Ode et al. 2016a) and recorded on standard SWAMP data forms. Water quality data obtained would include temperature, specific conductivity, salinity, dissolved oxygen, turbidity, and pH.

3.2.4 Fish Response

Abundance and Diversity

All sampling efforts would be quantified using catch per unit effort (CPUE). The CPUE would be computed for each sample method and assessed once multiple data sets are available for comparison. Numbers of individuals, weight, and area sampled would be recorded. A decline in CPUE, in comparison to baseline values and accounting for threats and stressors, would reflect a potential adaptive management trigger.

Condition

Condition factor (K) would be calculated for all fish specimens for which length and weight have been recorded. The condition factor of fish reflects environmental and biological circumstances and fluctuations in feeding conditions and physiological factors (Le Cren 1951). The condition factor also indicates changes in food reserves and can be used as an indicator of the general condition of aquatic organisms. Therefore, information on condition factor can be used to assess biological health of monitored organisms because the measure provides information about the specific condition under which organisms are developing (Araneda et al. 2008).

A decline in condition factor, in comparison to baseline values and accounting for threats and stressors, would reflect a potential adaptive management trigger.

Distribution

Fish presence would be recorded and tracked through the study area. Fish distribution would be determined through reconnaissance and pre-operation surveys, known distributions, and incidental observations made during other sampling efforts. Records may be kept as count data and volumetric data but would ultimately be provided as presence or absence of fish species within sampling reaches.

3.3 Timing and Frequency

The schedule and effort for the pre-operation and operation portions of the proposed study are detailed below. The pre-operation surveys would be five consecutive annual visits staged at any point prior to start of operation and within the seasonal restrictions indicated below. Monitoring efforts would be one-per-year visits each year following initiation of operation up to a 5- or 10-year timeline as determined by the Authority. For the purposes of this Aquatic Study Plan, it is assumed that sufficient access to the study area would be available in 2023.

Pre-Project implementation:

- Desktop scoping effort: lay out sampling reaches using geographic information system (GIS) data overlaid on aerial imagery, organize data sheets, and coordinate with water quality and SWAMP efforts. Spring 2022
- Initial reconnaissance: 2 days with 2-person crew; ideal timing would be when water levels are most restricted, which is typically in autumn.
- Pre-operation effort 1: 14 days with 4-person crew. 2023
- Pre-operation effort 2: 14 days with 4-person crew. 2024
- Pre-operation effort 3: 14 days with 4-person crew. 2025
- Pre-operation effort 4: 14 days with 4-person crew. 2026
- Pre-operation effort 5: 14 days with 4-person crew. 2027

Post-Project implementation:

- Operation effort 1: 14 days with 4-person crew. 2030
- Operation effort 2: 14 days with 4-person crew. 2031
- Operation effort 3: 14 days with 4-person crew. 2032
- Operation effort 4: 14 days with 4-person crew. 2033
- Operation effort 5: 14 days with 4-person crew. 2034
- Additional efforts up to 10 years after initial operation would be determined by the Authority.

The post-Project implementation schedule may be adjusted based on the Project construction schedule and construction completion.

Permitting Requirements

A CDFW Scientific Collecting Permit (Specific Use) or Memorandum of Understanding permit would be required to complete the study design as proposed. BMI samples would be the only collected species.

4.0 SWAMP Bioassessment Study Designs and Methods

4.1 Purpose of Bioassessment Monitoring Program

Stream bioassessment monitoring is a method of evaluating and monitoring the environmental health and integrity of freshwater wadeable streams by using BMI, water quality parameters, and PHAB conditions indicators of stream condition. Bioassessments are especially useful in tracking the aquatic conditions before and after a project is implemented to determine the project effects on aquatic communities. A SWAMP bioassessment that focuses on the relationships between PHAB, water quality, BMI, and algal communities would be conducted on the reaches downstream of the proposed impoundments on Stone Corral Creek and Funks Creek.

This information, along with the other studies (i.e., Fish Monitoring and Hydrogeomorphic Study), would help to inform the type of flow releases that should be made to the creeks under various operating conditions.

4.2 Overview of Proposed Methods

The bioassessment effort would be conducted using the methods described in the SWAMP 2016 SOP (Ode et al. 2016a, 2016b), or any updated version thereof. The reach-wide benthos method, which requires collection from each of 11 designated major transects across the sampling reach regardless of stream habitat type (e.g., riffle, run, pool), would be employed.

The ultimate number of individual sites, herein referred to as sampling reaches, on each creek would be based on access and safety; however, it is anticipated that five sampling reaches would be located on Funks Creek and that six sampling reaches would be located on Stone Corral Creek (Figure 5). Since there is no stringent guidance on establishing the number of bioassessment sampling reaches for a project such as this (Rehn pers. comm.), the number of sampling reaches was chosen to both best capture and quantify the two different elevational gradients within the study area (i.e., foothill and valley floor environments), and to have adequate spacing/distance between the sampling reaches (approximately 500 meters apart on Funks Creek above Funks Reservoir and approximately 2 kilometers apart elsewhere). Field and laboratory methods would be fully described in an associated Quality Assurance Project Plan.

4.3 Field Methods

This section summarizes the methods that would be used to collect all bioassessment data. All surveys would be performed by a qualified team of a biologist or biologists and a geomorphologist with expertise in benthic macroinvertebrate and algae collection, water quality monitoring, and PHAB data collection.

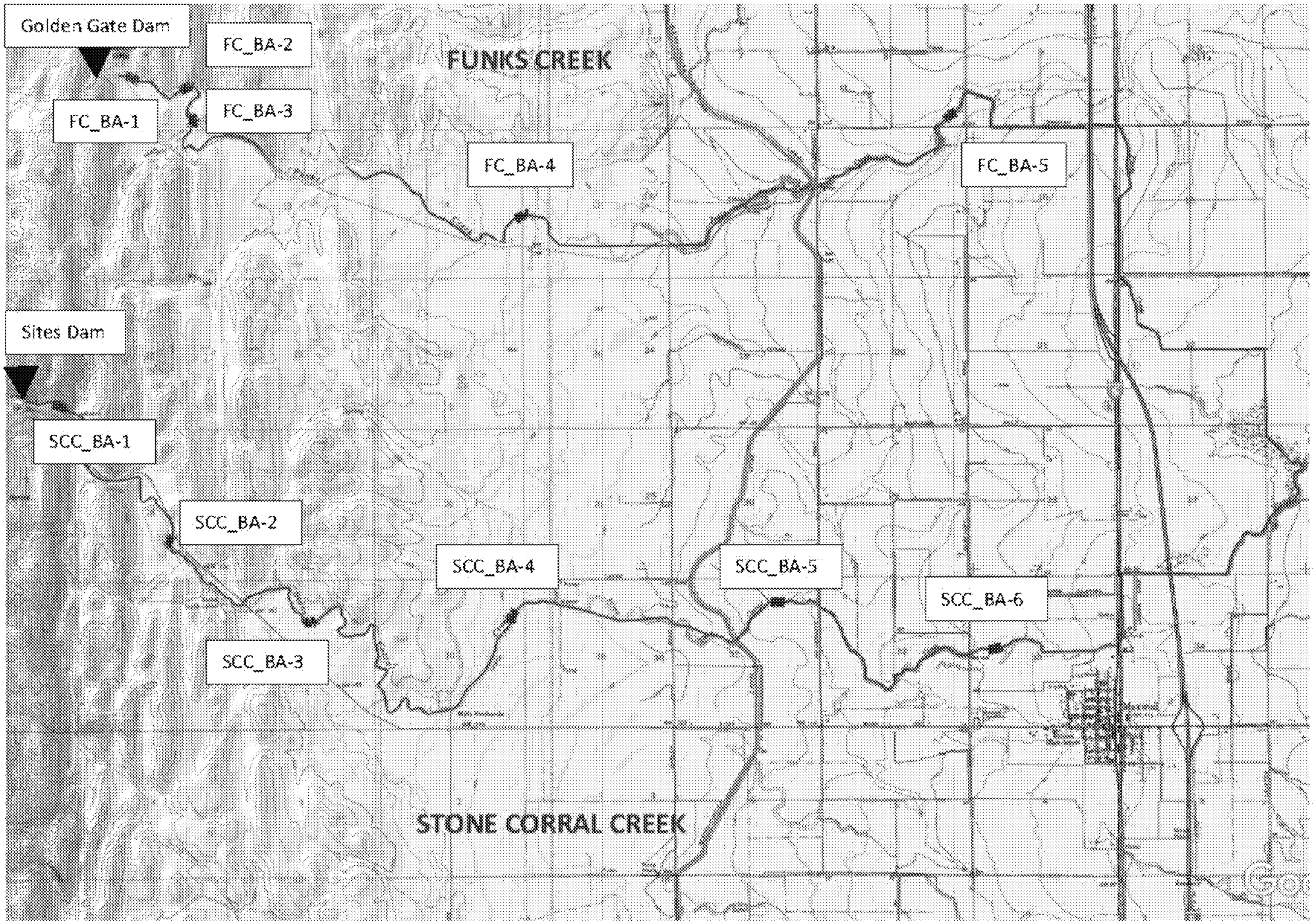


Figure 5. Potential Bioassessment Sampling Reaches, Stone Corral Creek and Funks Creek

4.3.1 Sampling Reach Delineation

As described in Chapter 2 of the SWAMP 2016 SOP, the average wetted width of each sampling reach would be used to determine the sampling reach length (Ode et al. 2016a). The SWAMP 2016 SOP specifies standard sampling reach lengths that are based on wetted width (150 meters for sampling reaches with average wetted widths less than or equal to 10 meters, and 250 meters for sampling reaches with average wetted widths greater than 10 meters).

After the sampling reach length is determined, it would be laid out using marked surveyor's flags for transect identification and transects would be labeled according to the SWAMP 2016 SOP (main transects A–K and inter-transects AB, BC, etc.) for a total of 11 main transects and 10 inter-transects.

4.3.2 Basic Data Collection

Basic information collected at each sampling site would include project name, sampling reach name, time and date of survey, stream/watershed name, global positioning system (GPS) coordinates, and the names of the survey crew members. GPS coordinates would be recorded with an appropriate collection device (e.g., hand-held GPS receiver or iPad). Data collected at the sampling reaches would include water quality and stream discharge measurements, PHAB, and BMI and algae sample collections. The most recent version of the SWAMP *Stream Habitat Characterization Form Full Version* field forms would be used to enter data in the field.

4.3.3 Water Quality and Discharge Measurements

Water quality data would be measured using a YSI Pro DSS unit (or similar collection device), following Chapter 3 of the SWAMP 2016 SOP (Ode et al. 2016a) and recorded on standard SWAMP data forms. Water quality data obtained would include temperature, specific conductivity, salinity, dissolved oxygen, alkalinity, turbidity, and pH.

To determine alkalinity (which is a standard YSI is not capable of doing), a water sample would be collected at each sampling reach. The sample would be taken at approximately 10 to 15 centimeters below the water surface. Using gloves, collectors would fill the water sample bottles to the brim to ensure that air bubbles would not get trapped in the sample bottle. The bottle would then be placed on ice in a cooler until all field data collections were completed. In the evening following each day's sample collection, the water samples would be removed from the coolers and allowed to warm to room temperature. Alkalinity would then be determined by the double endpoint titration method using a Hach Digital Titrator.

Stream discharge would be measured using a Marsh-McBirney Flo-Mate Model 2000 flow meter and following the Velocity Area Method (Module O in Chapter 8 of the SWAMP 2016 SOP (Ode et al. 2016a, 2016b). Efforts would be made to select a stream transect with a relatively uniform cross section and laminar flow, and at least 20 equally spaced data points would be used to estimate streamflow.

4.3.4 Physical Habitat Assessment and Photo-Documentation

As required by the SWAMP 2016 SOP, PHAB information would be collected at the sampling reaches at each transect and inter-transect location. At the 11 main transects, the full measurements listed in Chapter 6 of the SWAMP 2016 SOP would be taken (Ode et al. 2016a, 2016b). At the 10 inter-transects, fewer measurements would be taken per the SWAMP *Stream Habitat Characterization Form Full Version* field forms.

Digital photo documentation for each sampling reach would consist of upstream and downstream views at transects A, F, and K (i.e., the downstream, middle, and upstream portions of the sampling reach). Incidental observations such as recent rainfall, fire effects, flooding, and other disturbances would also be recorded.

At each sampling reach, reach-wide PHAB conditions relative to three Rapid Bioassessment Protocol (RBP) habitat parameters would be evaluated based on visual observations. These observations would include epifaunal substrate/cover, sediment deposition, and channel alteration. Each of these parameters would be scored using the following numeric value and ranked using the following 20-point scale, per the SWAMP 2016 SOP.

- 1–5 rank as poor
- 6–10 rank as marginal
- 11–15 rank as suboptimal
- 16–20 rank as optimal

4.3.5 Benthic Macroinvertebrate Sample Collection

BMI collection would be conducted according to the SWAMP 2016 SOP, using the reach-wide benthos method, which requires collection from each of the 11 major transects across the sampling reach regardless of stream habitat type (e.g., riffle, run, and pool). The BMI samples would be collected 1 meter downstream of each major transect by sampling a 1-foot-square area using a D-frame net. The sampling would begin at transect A (the downstream end) and continue upstream to transect K, with the sample location alternating from left (25% of width), to center (50% of width), to right (75% of width) on each subsequent transect.

All collections from the 11 major transects would be composited into a single sample and transferred into a 1-liter, wide-mouth plastic jar and preserved with 95% ethanol, following the SWAMP 2016 SOP. Samples would be labeled with collection site, time, and collector's name; and a chain-of-custody form would be filled out to accompany the samples on their way to the laboratory for identification. Replicate samples would be collected according to the SWAMP 2016 SOP at one sampling reach for quality assurance/quality control (QA/QC) purposes.

4.3.6 Algae Sample Collection

Algae would be collected in the same manner as the BMI samples, except that the algae would be collected 25 centimeters above the location where the BMI sample would be located. Algae samples would be collected using the sampling tools identified in the SWAMP 2016 SOP, which vary according to the substrate being sampled. A rubber delimiter would be used for large gravel and cobble; a PVC delimiter would be used for fines and gravels; and a syringe scrubber would be used for bedrock and large boulders (if present).

Similar to the BMI sampling, each algae sample collected at the 11 major transects would be composited into a single sample for processing. The processing of the algae would follow the SWAMP 2016 SOP, which would involve removal of algae from the substrates collected and processing the sample for the four algae analyses: quantitative soft-bodied algae, quantitative diatoms, ash-free dry mass (AFDM), and chlorophyll a. A soft-bodied algae qualitative sample would also be collected from each sampling reach by collecting a composite of all types of soft-bodied algae observed within the sampling reach into a single sample. This sample would aid in the identification of soft-bodied algae in the quantitative sample and would be used in the calculation of some of the algae metrics. Replicate algae samples would be collected at the same sampling reaches where replicate BMI samples would be collected.

4.4 Laboratory Processing

This section summarizes the methods that would be used to process all bioassessment data.

4.4.1 Water Quality

Water samples would be collected at each sampling reach to determine total nitrogen and total phosphorus, constituents necessary for helping to determine algal results. Samples would be sent to a local water quality processing laboratory in northern California. The water quality analyses would be consistent with SWAMP protocols for water chemistry. Total nitrogen would be analyzed according to U.S. Environmental Protection Agency Method 351.2, and total phosphorous would be analyzed according to Standard Methods 4500-P B and 4500-P E.

4.4.2 Benthic Macroinvertebrate Sample Processing

BMI sample taxa identification would be conducted by an outside laboratory (most likely by the Chico Aquatic Bioassessment Laboratory [Chico ABL] in Chico, California). BMI samples would be picked, sorted, and identified completely or until a 600 count (SAFIT Level 2) is reached. Chico ABL follows QA/QC procedures developed under the SWAMP program.

4.4.3 Algae Sample Processing

Five types of algae would be collected and processed: qualitative grab, soft-bodied algae, diatoms, AFDM, and chlorophyll a. The qualitative grab, soft algae, and diatom samples would be sent to the CDFW Group at the Marine Pollution Studies Laboratory at Moss Landing Marine Laboratories (MPSL-MLML). MPSL-MLML would report the data in SWAMP template formats. MPSL-MLML would calculate the Algae Stream Condition Index (ASCI) from the data. The samples of AFDM and chlorophyll a would also be sent to MPSL-MLML, who would report the data in California Environmental Data Exchange Network template formats. PSL-MLML follows the QA/QC procedures developed under the SWAMP.

4.5 Data Analysis

PHAB information would be entered using the SWAMP Version 2.5 bioassessment data entry forms (Marine Pollution Studies Laboratory 2022) and then loaded into the Microsoft Structured Query Language (SQL) Server database of the MPSL-MLML. BMI and algae taxonomy data, as well as water chemistry data would be loaded from Microsoft Excel templates into the same Microsoft SQL Server database. The data entry forms and templates would be obtained from the MPSL-MLML Data Center website. All data would be verified and checked for completeness after input into the database.

4.5.1 Physical Habitat Information

PHAB data would be entered by the MPSL-MLML using the SWAMP Bioassessment Field Form Microsoft Access database, and then loaded into the MPSL-MLML's Microsoft SQL Server database. After loading, additional error and completeness checks would be run following SWAMP business rules. The data would be sent to the California Environmental Data Exchange Network, where it would be available to the public for viewing and download.

PHAB metrics would be calculated using the SWAMP Bioassessment Reporting Module. The SWAMP protocol contains a subset of parameters measured within the U.S. Environmental Protection Agency's Environmental Monitoring and Assessment Program for freshwater wadeable streams; therefore, many of their metrics described in Kaufmann et al. (1999) form the basis of the SWAMP Bioassessment Reporting Module output.

SWAMP has developed a PHAB Index similar to the California Stream Condition Index (CSCI) (Section 4.5.3, *Benthic Macroinvertebrates*) for BMI data. The PHAB Index (called the *IPI*) combines eight GIS-calculated metrics with 12 PHAB metrics to produce one IPI value (Rehn et al. 2018). For the purposes of statewide assessments, the IPI has thresholds of physical condition: greater than or equal to 0.94 indicates likely intact condition; 0.93 to 0.84 indicates possibly altered condition; 0.83 to 0.71 indicates likely altered condition; and less than or equal to 0.70 indicates very likely altered condition.

In addition, the results would be compared to key stressor thresholds that best highlight the conditions at the sampling reaches identified in *Ecological Condition Assessment of California's Perennial Wadeable Streams: Highlights from the Surface Water Ambient Monitoring Program's Perennial Stream Assessment (PSA) (2000–2007)* (Ode et al. 2011). These select stressor thresholds are not regulatory limits set by SWRCB; rather, they are biology-based stressor thresholds developed by researchers as an objective means to set meaningful, regionally appropriate water quality standards. Two statewide and regional PHAB biological stressor thresholds, the Percent Fines and Sand and Mean Embeddedness thresholds, are examples of biological stressor thresholds that would be appropriate to analyze for this Project.

4.5.2 Water Quality

Similar to the PHAB analysis described above, water quality results would be compared to key stressor thresholds that best highlight the conditions at the sampling reaches identified in *Ecological Condition Assessment of California's Perennial Wadeable Streams: Highlights from the Surface Water Ambient Monitoring Program's Perennial Stream Assessment (PSA) (2000–2007)* (Ode et al. 2011).

4.5.3 Benthic Macroinvertebrates

MPSL-MLML would be contracted to assist in the analysis of the BMI data. MPSL-MLML would use the BMI taxonomic data obtained from Chico ABL to calculate CSCI scores for each sampling reach. The CSCI is a statewide biological scoring tool that translates complex data about individual BMIs found living in a stream into an overall measure of stream health (Rehn et al. 2015).

CSCI scores and output would be calculated using R scripts defined in Mazor et al. (2017). CSCI score categories would be applied as defined in Rehn et al. (2015).

- Less than or equal to 0.62: very likely altered
- 0.63–0.79: likely altered
- 0.80–0.91: possibly altered
- Greater than or equal to 0.92: likely intact

MPSL-MLML would also calculate several BMI metrics from the taxonomic data for each sampling reach. These individual metrics would be reviewed to discuss the individual results for each sampling reach and event. Representative metrics may include measures of taxa richness, composition, tolerance, functional feeding groups, and habit measures. These other metrics may be more insightful for determining the biological integrity of the BMI communities than the CSCI scores alone (at least in the valley floor sampling reaches), as valley floor reference sites (the sites used in the CSCI calculations) are relatively limited in abundance (Rehn pers. Comm.).

4.5.4 Algae

Diatoms and Soft Algae

MPSL-MLML would be contracted to calculate the statewide diatom, soft algae, and hybrid ASCI and associated metrics. These predictive biological indices replace past regional indices with a statewide index allowing for improved comparisons across diverse landscapes in a consistent and comparable manner. While ASCI can be calculated for soft algae and diatoms separately, the hybrid ASCI produces stronger species distribution models for more accurate and integrative assessments of biological condition.

Chlorophyll a and Ash-Free Dry Mass

Ode et al. (2011) in their analysis of the results from the statewide Perennial Stream Assessment between 2000 and 2007, have included stressor thresholds for chlorophyll a and AFDM. These thresholds are more protective than levels proposed by previous authors, which were 100 milligrams per square meter for chlorophyll a and 50 grams per square meter for AFDM (Barbour et al. 1999, Welch et al. 1988, Dodds et al. 1998, Sosiak 2002, Dodds and Welch 2000, U.S. Environmental Protection Agency 2000, Biggs 2000). The thresholds proposed by Ode et al. (2011) are not regulatory limits or requirements but rather recommendations. The chlorophyll a and AFDM stressor thresholds (statewide and regional) would be evaluated for each sampling reach by MPSL-MLML.

4.6 Timing and Frequency

The bioassessment surveys would be conducted during the appropriate index period for Central Valley streams (June through August), which is typically 4 to 6 weeks following the last winter storm event. Depending on stream conditions, however, bioassessment surveys may need to be performed prior to the appropriate index period to ensure adequate flow for benthic and algal sampling is present. Baseline (pre-operation monitoring) would occur in the spring for (possibly) 5 years prior to project operation. Follow-up (baseline) surveys would be conducted on an annual basis during the same period for up to 10 years after operation activities are initiated. The Authority and the relevant agencies (CDFW, USFWS, and Colusa County) would be consulted if the frequency of monitoring would be shortened after 5 years.

4.6.1 Permitting Requirements

A CDFW Scientific Collecting Permit (Specific Use) or Memorandum Of Understanding permit would be required to complete the study design as proposed. BMI samples would be the only collected species.

4.7 Additional Water Quality Measurements

In addition to the standard water quality measurements included in the SWAMP bioassessment as described above, samples would be collected for additional laboratory measurements. The objectives for taking these additional measurements would be to compare pre-Project and Project values, determine any effect of operational adjustments on sampled water quality constituents, and compare measurement values to key stressor thresholds. These additional measurements include:

- **A suite of total and dissolved metals and metalloids**. The suite includes aluminum, arsenic, cadmium, chromium (total), chromium, copper, iron, lead, manganese, mercury, methylmercury, nickel, selenium, silver, and zinc.
- **Cyanobacteria and cyanotoxins**. The cyanobacteria water samples would be collected for the purpose of laboratory analysis for cyanobacteria presence and density and the presence of cyanotoxins (specifically microcystins, anatoxin-a, and cylindrospermopsin).
- **Methymercury in fish tissue**. Level I trophic level fish would likely be more abundant than higher trophic level fish, so the measurements of methylmercury concentrations in fish tissue would focus on these fish. Higher trophic level fish would be sampled intermittently as available. To assess methylmercury in fish tissue, sampling would be conducted using the SWAMP protocol for California rivers and streams (California Water Boards 2011 or most current).

When these additional water quality samples and fish are collected, the following basic survey information and data described above would be collected: project name, sampling reach name, time and date of survey, stream/watershed name, and the names of the survey crew members. Incidental observations such as recent rainfall, fire effects, flooding, and other disturbances would also be recorded. Basic data collected at the sampling sites would include stream discharge measurements, temperature, specific conductivity, dissolved oxygen, turbidity, pH, and water samples for total nitrogen and total phosphorus laboratory measurements. In addition, water samples would be collected for laboratory measurements of dissolved organic carbon and hardness as these parameters influence water quality standards for aquatic life protection for some metals.

These measurements would be taken twice a year, once during a high flow period and once during a low flow period, at the upstream and downstream bioassessment sampling locations on each creek. Sampling would occur during the same years as the rest of the bioassessment studies.

5.0 Hydrogeomorphic Study

5.1 Purpose of Study

The overall purpose of the Hydrogeomorphic Study would be to characterize historical and present-day streamflows, including baseflow during the spring and summer months, on Stone Corral Creek and Funks Creek; the relevant geomorphic characteristics of each creek (herein called *geomorphic indicators*); and flow levels necessary for channel maintenance of geomorphic processes required to maintain the channels in their current condition.

A Hydrogeomorphic Study with quantitative and qualitative monitoring data to fully characterize the existing hydrologic regime of Stone Corral Creek and Funks Creek, as well as the overall type and abundance of sediment available for aquatic organisms, would be developed. To inform the appropriate streamflows for the creeks under inquiry, a geomorphic assessment would constitute the first step in the analysis. The channel segments upstream of the dams would also be rapidly assessed to provide a greater understanding of the local watershed geomorphic characteristics. The focus of the geomorphic assessment would be to determine the dominant geomorphic processes, document the surrounding landforms and channel bed topography, and to determine how the observed morphology of each creek is influenced by the hydrologic regime and the surrounding land uses. Likewise, collection of geomorphic information would aid in the determination of overall channel stability for each creek, which has important implications for the proposed releases.

The Hydrogeomorphic Study to examine the hydrologic regime of Stone Corral Creek and Funks Creek would include a desktop modeling exercise, as well as installation of stilling wells, staff gages, and real-time water surface level collection devices. The goal of the Hydrogeomorphic Study would be to evaluate the physical and hydrologic condition of the reaches of interest within both Stone Corral Creek and Funks Creek. This information, along with the other required studies as discussed in previous chapters (i.e., Fish Assemblage Study and SWAMP bioassessment study), would help to inform the type of flow releases that should be made to the creeks under various Project operating conditions.

After completion of the baseline studies, consideration would be given to when and how flows would be released and whether a portion of these flows are needed to maintain fluvial geomorphic processes (based on the findings from the geomorphic assessment).

5.2 Study Design

The (baseline) Hydrogeomorphic Study components are discussed below. *Field site locations* are applicable to the geomorphic component of the Hydrogeomorphic Study; *hydrologic monitoring locations* represent the potential locations where stilling wells, staff gages, and real-time water surface level collection devices would be installed (i.e., the hydrologic component of the Hydrogeomorphic Study). The ultimate number of field site locations on each creek would be based on access and safety; however, it is anticipated that five sites would be located on Funks Creek and that six would be located on Stone Corral Creek. The locations for the geomorphic component of the Hydrogeomorphic Study would presumably be the same as the bioassessment sampling reaches as part of the SWAMP bioassessment study as described in Chapter 4 (Figure 5). The ultimate number of hydrologic monitoring locations on each creek would primarily be based on access, due to the need for monitoring during and after precipitation events. It is anticipated that two sites would be located on each creek: one in the foothills and one on the valley floor as shown on Figure 6.

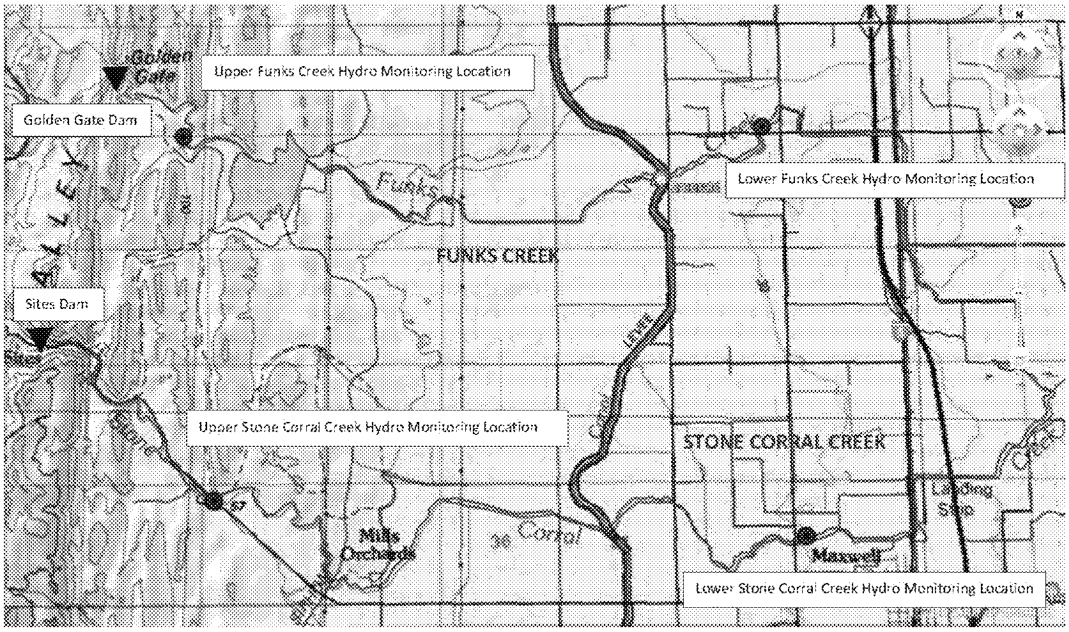


Figure 6. Potential Hydrologic Monitoring Locations, Stone Corral Creek and Funks Creek

5.2.1 Geomorphic Conditions

Data collected during the geomorphic component of the Hydrogeomorphic Study (geomorphic assessment) would include a host of geomorphic attributes, or indicators, as described below. Topographic data (longitudinal profile and cross sections) needed for the hydrologic model (further described below) would also be collected during the geomorphic assessment. The geomorphic assessment would be conducted by a geomorphologist with expertise in channel and floodplain dynamics, channel stability analyses, and topographic surveying techniques.

The geomorphic assessment would include evaluation of the following indicators.

- Channel classification
- Local watershed inputs
- Hydrologic and flow patterns
- Riparian vegetation condition
- Bankfull width and depth and wetted width
- Bank instability and bank characteristics
- Channel bed substrate composition and embeddedness
- Channel complexity
- Degree of channel incision
- Stage of channel evolution
- Cross section and longitudinal profile surveys

These indicators would be assessed for each field site location (Figure 5). In addition, at least three permanent cross sections would be established within each field site location and within each hydrologic monitoring location (Figure 6) for collection of quantitative channel morphology information and required modeling input. Evaluation methods for these indicators are described below.

Channel Classification

Stream and river segments can be grouped into three generalized classifications based on their position in the watershed and the relative balance of transport capacity to sediment supply (Montgomery and Buffington 1998). Headwater source areas are typically transport-limited (often due to limited channel runoff) but do offer sediment storage that is intermittently initiated under large flow events, debris flows, or other gravitational events. Transport segments are composed of morphologically resilient, supply-limited reaches (e.g., bedrock, cascade, and step-pool) that rapidly convey increased sediment inputs. Response segments consist of lower-gradient, more transport-limited depositional reaches (e.g., plane-bed, pool-riffle) where channel adjustments occur in response to changes in sediment supply delivered from upstream.

Based on field observations and the stream classification methodology of Montgomery and Buffington (1998), each field site location would be classified accordingly. The classification would aid in the determination of the sediment regime and bedform morphology, which would help characterize the stream habitat and function of each field site location on the reaches of interest.

Local Watershed Inputs

Any major inputs of sediment and runoff into the field site locations (e.g., landslides or other mass wasting features, recent burn scars) would be summarized. The objective would be to identify any land use changes that could alter the balance of sediment supply and runoff that could lead to future instability (e.g., channel aggradation of degradation) within the reaches of interest. This would aid in the determination of channel stability and the potential for available habitat to be disrupted or altered in the vicinity of the field site locations.

Hydrologic and Flow Patterns

The hydrologic pattern would be determined throughout the length of the field site locations and would include identification of whether streamflow is perennial, intermittent, or ephemeral. Perennial streams are those which flow year-round; intermittent streams are those which flow for only certain times of the year and receive water from both surface water and groundwater; and ephemeral streams are those which have their channels above the water table year-round and only receive water from surface runoff. This geomorphic indicator would rely on the field-based hydrologic component of the overall Hydrogeomorphic Study, as described below.

Riparian Vegetation Condition

Riparian vegetation is an important indicator for overall stream habitat and function as it serves to stabilize streambanks and allows for canopy cover to create suitable water temperatures for aquatic species. Riparian condition refers to a description of the general health of the riparian area, focusing on the amount and type of vegetative cover.

Within each field site location, riparian condition would be described as low (0–25 % vegetative cover), moderate (25–50 % vegetative cover), high (50–75 % vegetative cover), or very high (75–100 % vegetative cover). The size and approximate age of any riparian vegetation growing in the channel bed would be documented because this is evidence of channel adjustment and possible re-stabilization from a prior disturbance.

Bankfull Width and Depth and Wetted Width

Bankfull width and depth measurements would be recorded to assess the hydraulic capacity of the channel in the field site locations. Specifically, a geomorphic or effective bankfull surface would be identified in the field. The geomorphic bankfull or effective surface is the surface that gets inundated by the discharge that performs the most geomorphic work on a system, typically a flow that occurs every 1.5 to 2 years (Knighton 1999). This discharge, known as the geomorphic bankfull discharge, is defined as that water discharged when stream water just begins to overflow into the active floodplain. The geomorphic bankfull or effective surface would be identified based on the methodology of Harrelson et al. (1994) and Hauer and Lamberti (1996). Once this surface is recognized, width and depth measurements would be recorded.

Like bankfull width and depth measurements, wetted width and depth measurements would be recorded. Specifically, the wetted surface would be identified in the field and width and depth measurements would be recorded.

Bankfull and wetted width and depth data collection would help to determine the size of the channel, which would help in assessing overall available habitat conditions in the field site locations and reaches of interest.

In addition, the “active channel” width would be identified, which typically represents a typical low to moderate flow regime and is usually bounded by the width of the in-channel vegetation.

Bank Instability and Bank Characteristics

The term *bank instability* refers to streambanks that are either actively retreating or have the potential to retreat soon. In brief, weakening processes are any bank or near-bank processes that act to erode or prepare streambanks for further erosion (Lawler 1992). The purpose of assessing this indicator would be to identify fluvial erosion (erosion associated with flowing water) and bank failure (erosion associated with gravitational forces and weakening processes). Fluvial erosion is closely related to boundary shear stress, which can be loosely approximated by unit stream power variations, and bank failure is collapse of all or part of the streambank in situ (Lawler 1995).

Bank stability would be defined as the natural streambank that has stable groundcover. Stable ground cover includes rooted trees, shrubs, herbaceous plants, and naturally occurring rocky substrates. Bank composition and bank height/angle would also be determined. The results, in conjunction with the other indicators, can be used to detect where the channel may be downcutting as suggested by over-steepened banks, and can also be used to describe the potential for the channel to potentially laterally migrate and increase the risk of bank instability.

Bank stability analyses would aid in determination of the sediment regime and bedform morphology, which would help characterize the stream habitat and function of the field site locations, as well as the determination of channel stability and the potential for available habitat to be disrupted or altered in the field site locations.

Channel Bed Substrate Composition and Embeddedness

Substrate composition and embeddedness refer to the size of the substrate materials on the channel bed, and the degree to which these materials are embedded. These conditions indicate how frequently the channel substrate is mobilized. Substrate composition and embeddedness would be measured using the methods described by Bunte and Abt (2001). Substrate composition would identify the available substrate (overall type and abundance) for aquatic species in the vicinity of each field site location.

Channel Complexity

The presence or absence of gravel bar development and evidence of scour and/or deposition would be determined throughout the length of each field site location. Pool and riffle habitats containing in-channel structures (e.g., instream woody material) that create complexity and habitat niches for aquatic organisms would also be documented. Basic channel or habitat units (e.g., pool, riffle, and flatwater) would be delineated according to standard habitat mapping descriptions in each field site location. A rough proportion of unit types would be calculated.

Channel or habitat units would be defined as follows.

- **Pool.** Slow water, length, and width at least one-half the bankfull channel width, and a 10-inch minimum residual pool depth. Subcategories define the general type of pool and include scour (lateral, channel, channel confluence, plunge), dam, and backwater, as defined by Overton et al. (1997).
- **Riffle.** Swiftly flowing, turbulent water, some partially exposed substrate, substrate cobble, and/or boulder dominated (McCain et al. 1990).
- **Flatwater.** Wide, uniform channel bottom, low to moderate water velocity, and little surface agitation. Encompasses any areas that do not qualify as pool or riffle (McCain et al. 1990).

If appropriate (i.e., if the habitat diversity merits such a method), the field site locations would be habitat typed to provide a more detailed stream habitat inventory. Stream habitats would be delineated into one of the six Level-III habitat classification types (Flosi et al. 2010) based on morphological characteristics. These include overall channel gradient, water velocity and depth, substrate, and, where applicable, the channel features (e.g., boulder, bedrock, woody material, converging flow) causing the formation of the habitat unit through scour and sediment deposition (Flosi et al. 2010). Channel/habitat type determination would allow for identification of available habitat types for aquatic species.

Degree of Channel Incision

The degree to which the channel is incised would be recorded as negligible, low, moderate, high, or very high. The degree of incision would be qualitatively analyzed using the following criteria.

- **Identification of any Quaternary landforms on the floodplain (e.g., terraces, low floodplain, fan, etc.).** Terraces typically have steep streambanks, and the channel may not necessarily be incised. Steep, unstable streambanks adjacent to a low floodplain surface, however, typically indicate incision.
- **Identification of bedforms downstream of the site where and if the channel is less incised.** Bed and streambank material from incised channels would typically be deposited downstream in somewhat uncharacteristically large deposits on the channel bed (downstream aggradation).
- **Recognition of base level changes downstream.** Dams and other barriers can create upstream changes in channel bed elevation (i.e., headward migration of incision).
- **Visual survey of channel bed at the field site location.** Channel or habitat sequences, such as pool-riffle sequences, are rare in incised channels, and those that do exist do so for only limited time

intervals. Additionally, the increased depth of flow associated with incision, coupled with an increased flashy regime, results in bed armoring and a decreased frequency of bed mobilization.

- **Determination of the health of the riparian and floodplain plant species.** Plants that are found in similar, un-incised reaches are usually not present in incised reaches. No vegetation at all is an indicator of no hydrologic interaction between the floodplain and the channel and, therefore, incision.
- **Identification of recent evidence of overbank deposition of fine sediment, plant debris, or other organic matter.** A channel that floods its streambanks frequently would typically have splay (i.e., sand) deposits and vegetation with a smoothed, flooded appearance in the downstream direction. Natural levee development is also an indication of frequent flooding.

Stage of Channel Evolution

A stream evolution model (Cluer and Thorne 2013) would be applied to the entirety of the reaches of interest on Stone Corral Creek and Funks Creek to provide a template for understanding geomorphic responses and processes within the immediate watershed. The stream evolution model of Cluer and Thorne (2013) revisits and updates two well-established channel evolution models (Schumm et al. 1984, Simon and Hupp 1987) in light of recent research and the authors' practical experiences.

In addition, a channel stability analysis would be conducted at each field site location. The chosen methodology would be dictated by site conditions but could include the methods as presented in the modified Pfankuch procedure (Pfankuch 1975) as described by Rosgen (2001), Simon and Down (1995), Bledsoe et al. (2010), or other applicable method. The stream evolution model and the channel stability analyses would aid in the determination of how on Stone Corral Creek and Funks Creek may evolve (e.g., deepen/widen) or remain in a state of equilibrium in the future, thus, having implications for the available habitat within the channels.

Cross Section and Longitudinal Profile Surveys

As mentioned above, at least three permanent cross sections would be established within each field site location (Figure 5) and within each hydrologic monitoring location (Figure 6) for collection of quantitative channel morphology information and required modeling input. Permanent cross sections would be established perpendicular to the primary channel following the methodology of Harrelson et al. (1994). Each transect would be surveyed using ground-based surveying equipment to capture and track channel morphology. Elevations along the cross sections would be collected at intervals close enough to capture slope breaks and distinct morphological features within the floodplain (if present), and along the channel sides and bottom.

The location of each cross section would be permanently marked in the field using 4-foot-tall metal t-posts or wooden lathes (to easily find the general transect location) and with rebar driven vertically into the ground surface, capped with an appropriate cover (to establish known permanent elevations [permanent monuments or benchmarks] on each side of the transect). The permanent benchmarks for each transect would be placed in a stable location above the active channel on the left and right (as viewed facing downstream) banks or terraces of the channel. Transect endpoints (i.e., the permanent monuments) would be documented using a GPS receiver. Representative photographs would be taken at each cross section.

In addition to the cross sections, a longitudinal profile would be surveyed throughout the length of the channel within a field site location. The spacing between channel bed data points would vary depending on the complexity of the channel bed characteristics. Digital photographs would be taken in the upstream and downstream directions at various locations throughout the longitudinal profile. The location(s) of each cross section would be surveyed on the longitudinal profile for graphical plotting purposes.

Channel Geometry Metrics

As mentioned previously, bankfull width and depth measurements would be recorded to assess the hydraulic capacity of the channels. This would be completed at the cross sections measured in the field. In addition to bankfull, wetted, and active channel width and depth measurements, the bankfull and entire channel width-to-depth ratio would be calculated for each cross section, and sinuosity and gradient of the longitudinal profile would be determined.

5.2.2 Hydrologic Conditions

The hydrologic component of the Hydrogeomorphic Study would consist of both desktop (modeling and historical conditions review) and field-based efforts (generation of stage-discharge relationships), both of which are summarized below. The desktop effort would provide detailed information on various (modeled) flows of interest (i.e., the 2-year, 5-year, 10-year, 50-year, and 100-year flow events), while the field-based efforts would validate/calibrate the modeling results via collection of real-time streamflow data, especially for smaller streamflow events (the flows that are expected to occur most of the time on each creek).

Summary of Modeling Approach

A HEC-HMS rainfall-runoff-routing watershed hydrology model would be created to generate hydrographs for both Stone Corral Creek and Funks Creek. Inputs into the hydrology model would include watershed land use, percent impervious inputs, soil types, precipitation and evapotranspiration, drainage network characteristics, and topography (which would be generated from available light detection and ranging [LiDAR] technology).

The topographic surveys as described above would also serve to augment the existing LiDAR data with on-the-ground data to better capture topography in areas requiring additional detail (such as densely vegetated areas). The topographic surveys would be tied into the State Plane Coordinate System and would be sufficient to generate contours at a 1-foot interval. The data collected via the topographic surveys would also be required for generation of stage discharge relationships, as described below.

It should be noted that HEC-HMS rainfall-runoff-routing watershed hydrology model constitutes the first (somewhat exploratory) step in the hydrologic analysis. As discussed in the RDEIR/SDEIS, any releases into Funks Creek would be made through the transition manifold at the base of Golden Gate Dam and a new pipeline that terminates at Funks Creek below the dam. These facilities would carry up to 100 cfs with a release range of 0 to 100 cfs into Funks Creek. Any releases into Stone Corral Creek would be made through the permanent outlet at Sites Dam. This outlet would have a release range of 0 to 100 cfs, with an emergency release capacity of up to 2,500 cfs. The modeling effort would be the first step in determining if a range in flows, as described in the RDEIR/SDEIS, would be needed to meet the purpose of CFGC Section 5937 given the modeled hydrology.

Summary of Field-Based Analysis

The primary objective of the field investigation would be to provide an accurate description of the existing watershed hydrology and variations in streamflow and water surface elevations (i.e., stage) on both Stone Corral Creek and Funks Creek. Periodic streamflow measurements (depth and velocity measurements) would be taken to develop stage-discharge relationships (rating curves) to translate the continuous water depth measurements measured with continuous stage recorders (i.e., HOBO water level loggers [Onset Computer Corporation]) into continuous estimates of flow. These measurements would occur at the hydrologic monitoring locations as shown on Figure 6.

To determine continuous estimates for streamflow, the stage recorders, which measure water temperature and pressure, and vertical stilling wells would be installed in relatively deep portions of the creeks at the locations as shown on Figure 6. The HOBO water level loggers would be set to monitor water depth every 15 or 30 minutes. Additional HOBO water level loggers would also be installed to monitor barometric pressure every 15 or 30 minutes for the purpose of calibrating the depth (water pressure) measurements, which are also affected by barometric pressure. These additional data loggers would be secured to upland surfaces (e.g., trees). Streamflow measurements would be collected to develop equations to convert the continuous stage recorder data into estimated streamflows (discharge). During variable discharge conditions, streamflows would be estimated using a Marsh-McBirney Flo-Mate Model 2000 flow meter and top-setting rod following the procedures described in Module O in Chapter 8 of the SWAMP 2016 SOP (Ode et al. 2016a, 2016b).

Daily precipitation data obtained from the California Data Exchange Center or the PRISM Climate Group would be used to characterize the rainfall patterns during the study period. Rainfall patterns would be displayed concurrently with the measured streamflow data.

If necessary, acoustic Doppler current profiler (ADCP) technology could be used to capture high flow events. ADCP equipment is particularly useful for collecting accurate and precise water depth and 2-D/3-D velocity data, especially at high flows when other standard surveying techniques as described above are impractical or unsafe. ADCP technology also offers the advantage of detecting bed elevation change resulting from high flow events that would be useful for evaluating sediment mobility in the reaches of interest. The applicability of ADCP would be investigated during the first season of hydrologic monitoring (once field conditions at the field site locations are ascertained).

5.3 Timing, Frequency, and Operation Monitoring

5.3.1 Pre-Operations Monitoring

The baseline geomorphic component of the Hydrogeomorphic Study would first be conducted during the winter/spring of 2023. It is anticipated that all relevant geomorphic indicators could be collected during one field trip. Additional baseline geomorphic data collection during subsequent years would be conducted if high precipitation patterns/high flow events occur during the pre-operation period.

The desktop hydrologic component of the Hydrogeomorphic Study would occur during 2023. The field-based hydrologic component of the Hydrogeomorphic Study would occur at the locations as shown on Figure 6 until the dams are constructed.

5.3.2 Operations Monitoring

Follow-up geomorphic and hydrologic surveys would be conducted on a regular (pre-approved) basis for up to 10 years after operations begin. The Authority would consult with the relevant agencies (CDFW, USFWS, and Colusa County) if the frequency of monitoring would be shortened after 5 years. Additional information on each component of is provided below.

Geomorphic Stability Monitoring Plan

Operations geomorphic monitoring would generally be like the pre-operation efforts, including returning to established field site locations and collecting information on geomorphic indicators by performing a geomorphic assessment as described above. Data collected as part of the operations geomorphic monitoring effort would be compared against the baseline data and summarized into interim and final reports to the Authority.

The focus of the operations geomorphic monitoring effort, however, would be geomorphic stability monitoring. As such, the primary survey components of monitoring would include cross section and longitudinal profile surveys, channel bed substrate composition determination, and channel stability evaluations. All methods for these efforts would be identical to those described above. The objectives of these monitoring elements and their relevance to geomorphic stability are summarized below.

Cross Section and Longitudinal Profile Surveys

The objectives of collecting data at the cross sections would be to collect primarily lateral stability information to determine the rate of lateral migration through bank erosion and overall cross-sectional area change. The rate, magnitude, and direction of lateral change and area change would be determined over time using repeat longitudinal profile surveys.

The objective of collecting data at the longitudinal profiles would be to collect primarily vertical stability information to determine rates of aggradation or degradation (whether the stream is downcutting [degrading], filling [aggrading], or remaining static). The rate, magnitude, and direction of vertical change would be determined over time using repeat longitudinal profile surveys.

Channel Bed Substrate Composition and Embeddedness

The objectives of collecting channel bed substrate composition and embeddedness information would be to observe potential shifts in bed material size-frequency distribution, which can be determined over time. Collected grain size information would aid in interpretation in specific geomorphic changes if they occur (such as any changes identified via the cross-sectional and longitudinal profile analyses above).

Channel Stability Evaluations

The chosen methodology for channel stability evaluations would be dictated by site conditions but could include the methods as presented in the modified Pfankuch procedure (Pfankuch 1975) as described by Rosgen (2001), Simon and Down (1995), Bledsoe et al. (2011), or other applicable method. Together with the stream evolution model (Cluer and Thorne 2013), the channel stability analyses would aid in the determination of how Stone Corral Creek and Funks Creek may continue to evolve (e.g., deepen/widen) or remain in a state of equilibrium in the future, thus having implications for the available habitat within the channels.

Hydrologic Monitoring Plan

Operations hydrologic monitoring would be like the pre-operation field-based efforts, including returning to established hydrologic monitoring locations, monitoring stage and stream discharge over time. Data collected as part of the operation hydrologic monitoring effort would be compared against the baseline data and summarized into interim and final reports.

The level of effort of the operations Hydrologic Monitoring Plan, however, would be considerably less than for the pre-operation effort because, depending on the streamflow and precipitation patterns during the pre-operation time-period, there would presumably already be numerous years of pre-operations hydrologic monitoring data at the hydrologic monitoring locations (in other words, a robust data set with multiple discharge measurements and associated stages would be available). The operation hydrologic monitoring effort would, therefore, primarily consist of measuring streamflow values that were not obtained during the pre-operation monitoring effort (presumably higher flow events) and conducting routine field maintenance activities such as periodic downloads of the HOBO water level loggers and upkeep of field equipment.

6.0 Temperature Study Design and Methods

6.1 Overview of Proposed Methods

A temperature study would be conducted to characterize temperatures under existing conditions and determine flow and storage effects on temperature in Stone Corral Creek and Funks Creek under operating conditions. The study would involve evaluating temperatures in the creeks before and after initiation of Project operation and would include consideration of the effects of creek flow and reservoir storage on temperature.

The study would assess the following.

- The temperatures that support the aquatic community under existing conditions.
- Reservoir discharge needed to maintain appropriate temperatures to maintain fish in good condition in Stone Corral Creek and Funks Creek downstream of Sites Reservoir after the start of operation.
- Documentation of hydrologic and flow patterns (as described in Section 5.2.1, *Geomorphic Conditions*)

6.2 Study Design

Once access to Stone Corral Creek is obtained, a temperature probe would be installed in Stone Corral Creek at the location of Sites Dam release, and four additional probes would be installed downstream by approximately 0.5 mile, 1 mile, 2.4 miles (near where Stone Corral Creek goes under Maxwell Sites Road), and 4.4 miles (near where TC Canal goes under Stone Corral Creek).

Once access to Funks Creek is obtained, a temperature probe would be installed in Funks Creek at the location of the I/O tower release to Funks Creek, and two additional probes would be installed downstream by approximately 0.5 mile and 1 mile (far enough upstream of Funks Reservoir to be unaffected by it). In addition, probes would be installed at the TC Canal inlet to Funks Reservoir, at the TC Canal outlet from Funks Reservoir, and at the Funks Creek outlet from Funks Reservoir.

As described in the draft Reservoir Management Plan included in Appendix 2D of the RDEIR/SDEIS, once operation has commenced, water temperature profiles would be measured near Golden Gate Dam once every 2 weeks at 5-feet depth intervals to inform decisions about which ports of the I/O tower to use during March through October. The temperature probes in the creeks would continuously record hourly temperatures. These temperatures would be used along with specific fish requirements to develop target temperature ranges for operation conditions.

Temperatures recorded after Sites Reservoir is operational would be used in conjunction with flow and storage data to determine flow and storage effects on creek temperatures. If creek temperatures cannot be accurately estimated with flow, storage, meteorology, and the reservoir temperature profiles, water temperature modeling could be performed for Sites Reservoir, Stone Corral Creek, and Funks Creek. If modeling is necessary, models would be calibrated with the measured flow, storage, and temperature data.

Water released into Stone Corral Creek would originate from the lower half of Sites Reservoir and would likely be cooler than equilibrium values during months when the reservoir is stratified. The biggest differential between release temperatures and equilibrium values would occur when the reservoir is full and ambient air temperature conditions are high. If it is determined that flow should be maintained in Stone Corral Creek at times when releases would be relatively cool compared to temperatures under existing conditions, lower flows would allow the water to warm farther upstream than higher flows.

Water released to Funks Creek would originate from the I/O tower and, when the reservoir is stratified, would be warmer than the water released to Stone Corral Creek. The temperatures would be warmer because the withdrawals would come from higher in the reservoir and, as described in the Reservoir Management Plan, the I/O tower port openings would be chosen to provide 65 degrees Fahrenheit (°F) or higher water temperatures during the rice growing season (May through September).

6.3 Timing and Frequency

Water temperature measurements would occur before and during operation. Measurements during the initial fill period would be useful for evaluating water temperature under low-storage conditions. Reservoir profile measurements and measurements at the Stone Corral Creek and Funks Creek releases may need to continue in the long term.

Measurements downstream of the release locations could be discontinued if the following conditions are met.

- Sites Reservoir has made releases for at least 2 years when the reservoir was at least 75% full.
- If native fish are found and temperature effects are determined to have little effect on the population(s) (e.g., if only short sections of the creeks below the dams experience temperature effects) or if flow and storage effects on creek temperatures are understood well enough that average daily creek temperatures can be estimated within 3°F based on meteorological conditions, flow, reservoir storage, and reservoir temperature profiles.

7.0 Reporting and Permit Requirements

7.1 Annual Reporting Requirements

Reporting requirements would be met through the preparation and submittal of annual and final reports as part of the Aquatic Study Plan that would be implemented as a part of the Authority's commitments and responsibilities to maintain fish in good condition consistent with CFGC Section 5937.

The first five annual reports would summarize the first 5 years of baseline conditions. All future (operation) reporting efforts would compare the conditions at that time to those collected during the baseline conditions.

The following information would be addressed in comprehensive annual reports with multiple chapters covering fish, bioassessment, hydrogeomorphic, and temperature study results.

- **Fish Study Results.** The annual report would include descriptions and locations of fish communities in Stone Corral Creek and Funks Creek, summarizing monitoring results in the study area. The report would document monitoring results and link results to objectives. The report would identify new or ongoing management issues, threats and stressors, and provide recommendations for future monitoring and management.
- **Bioassessment Results.** The annual reports would include BMI, algae, water quality, and PHAB output and results and a summary of each of these indicators. The most recent version of the SWAMP *Stream Habitat Characterization Form, Full Version* field forms would be provided in appendix format, along with representative photography of the sampling reaches.
- **Hydrogeomorphic Results.** The annual reports would include a summary of the monitoring methods; a summary and analysis of the hydrogeomorphic monitoring results, including an evaluation of site conditions in the context of the performance standards; a discussion of the monitoring results; a discussion of any modifications made to the monitoring methods; a discussion of the previous year's monitoring efforts; and photographs taken from the cross sections and longitudinal profiles.
- **Temperature Results.** The annual reports would include a summary of temperatures that support the aquatic community under existing conditions, and a recommendation of reservoir discharge needed to establish suitable temperatures in Stone Corral Creek downstream of Sites Dam and Funks Creek downstream of Golden Gate Dam after operation has commenced.
- **Monitoring Program Evaluation.** The annual reports would evaluate the Aquatic Study Plan to ensure that data (1) are collected efficiently, (2) address information needs, and (3) adequately assess resource responses to management actions. Changes in monitoring methods, protocols, or frequency would be summarized in the annual reports.
- **Objective Criteria Evaluation.** Annual reports during operations would evaluate whether management actions are meeting project objectives or performance standards (described below). An assessment would be made as to causal factors of observed declines, including the potential role of external stressors outside the parameters of Project effects.
- **Adaptive Management Thresholds.** The link between the technical and decision-making steps requires regular interaction and exchange of information between technical staff and decision-makers. This would be accomplished by annual meetings involving the Authority and the agencies where if necessary, both regulatory and technical expertise can be integrated into revising goals and

objectives, adjusting management and/or monitoring activities, or allocating funding. Meetings should be timed such that any new information discussed assists with the planning of upcoming seasonal work.

7.2 Performance Standards

Performance standards for the Aquatic Study Plan would be based on quantitative metrics. These performance standards would be designed specifically as a means of monitoring the progress and performance of the physical and biological conditions of the study reaches.

Fish community performance standards would include measures of community diversity and percent area occupied for both available and total reach distance within the study areas. BMI performance standards would likely include three main indicators—PHAB IPI scores, BMI CSCI scores, and algae ASCI scores. Geomorphic performance standards would focus on channel stability evaluations such as:(1) evidence of significant and detrimental morphologic changes at any of the cross sections; (2) evidence of channel headcutting; (3) significant loss of gravels via dam impoundment; and (4) significant decrease in the channel stability score during the duration of monitoring activities.

Performance standards would be developed in conjunction with the Authority and the relevant agencies (CDFW, USFWS, and Colusa County) prior to the start of operation monitoring.

7.3 Operations Plan

The Authority would use information from the results of implementation of this Aquatic Study Plan, including field studies described herein, to prepare the Operations Plan. The Operations Plan would describe the approach to address CFGC Section 5937 requirements, if any, resulting from impoundments to storage of flows from Stone Corral Creek and Funks Creek, while also ensuring that the Project's flood protection benefits are realized. Further, the Operations Plan would include, but would not be limited to, the approach for reservoir releases into Stone Corral Creek and Funks Creek, including release schedules and volumes. As stated in the Authority's application to appropriate water, the Operations Plan would be developed in consultation with CDFW, USFWS, and Colusa County, and approved by the Deputy Director for Water Rights.

7.4 Anticipated Schedule

The following schedule is anticipated to result in a reduced workload once a range of flows is encountered with representative variability of environmental conditions (Table 3). For example, the field-based Hydrologic Study could possibly occur over the course of the 5 years leading up to dam construction and could terminate once a suitable range of flows has been measured and analyzed. This could occur within 1 year if flow conditions are variable enough, but more than likely it will occur over a series of years.

Table 3. Anticipated years that each study will be needed to acquire a representative range of environmental conditions for baseline and post operation periods.

Year	Fish Community	Bioassessment Study	Water Quality	Water Temp.	Geomorphic Study	Hydrologic Study (desktop)	Hydrologic Study (field)
Baseline							
2023	√	√	√	√	√	√	√
2024	√		√	√			√
2025	√	√	√	√			√
2026	√		√	√			√
2027	√	√	√	√			√
Post Operation							
2030	√	√	√	√	√		√
2031	√		√	√			
2032	√	√	√	√	√		√
2033	√		√	√			
2034	√	√	√	√	√		√

8.0 References

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8.2 Personal Communications

Rehn, Andrew. Biologist, California Department of Fish and Wildlife. April 6, 2022—Phone conversation with Jeff Peters of ICF and Marco Sigala at Moss Landing Marine Laboratories regarding a suitable number of bioassessment sampling reaches on Funks Creek and Stone Corral Creek for the Sites Reservoir Project.

From: Laurie Warner Herson [laurie.warner.herson@phenixenv.com]
Sent: 1/11/2023 1:28:58 PM
To: David Hubbard [Dhubbard@BrwnCald.com]; Alicia Forsythe [aforsythe@sitesproject.org]
CC: mmaltby@brwncald.com
Subject: RE: Sites Strike Team Schedule - Justifications for Slips

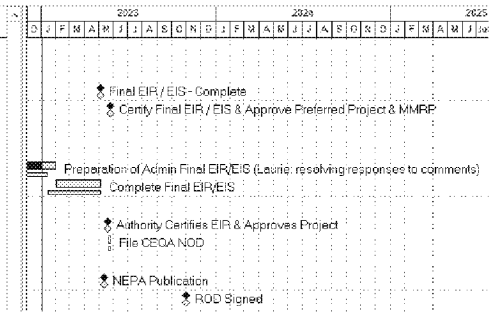
Thanks Dave

From: David Hubbard <Dhubbard@BrwnCald.com>
Sent: Wednesday, January 11, 2023 1:20 PM
To: Laurie Warner Herson <laurie.warner.herson@phenixenv.com>; Alicia Forsythe <aforsythe@sitesproject.org>
Cc: Marcus Maltby <mmaltby@BrwnCald.com>
Subject: RE: Sites Strike Team Schedule - Justifications for Slips

Thanks Laurie – reducing it by the 12 days (80 to 68) takes care of that and gets the Approval back to May 19.
See below. I'll go with this unless someone objects.

Layout: Sites Comp vs Prior Month — Filter: All: Less than 100%

#	Activity ID	Activity Name	Start	Finish	Remaining Duration	Last Month Finish	Variance LM Finish
223	**Environmental**						
224	**Key Deliverables**						
225	KD-1470	Final EIR / EIS - Complete		05-May-23	0	05-May-23	0
226	KD-1480	Certify Final EIR / EIS & Approve Preferred Project & MMRP		26-May-23	0	26-May-23	0
227	**EIR/EIS**						
228	**Final EIR/Final EIS**						
229	EIR-210	Preparation of Admin Final EIR/EIS (Laurie: resolving responses to comments)	03-Jan-22 A	31-Jan-23	21	13-Jan-23	-12
230	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
231	**Authority Certifies EIR & Approves Project & File NOD**						
232	EIR-370	Authority Certifies EIR & Approves Project		19-May-23	0	19-May-23	0
233	EIR-380	File CEQA NOD	22-May-23	26-May-23	5	26-May-23	0
234	**ROD**						
235	EIR-440	NEPA Publication		12-May-23	0	12-May-23	0
236	EIR-450	ROD Signed		31-Oct-23	0	31-Oct-23	0



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From: Laurie Warner Herson <laurie.warner.herson@phenixenv.com>
Sent: Wednesday, January 11, 2023 3:17 PM
To: Alicia Forsythe <aforsythe@sitesproject.org>; David Hubbard <Dhubbard@BrwnCald.com>
Cc: Marcus Maltby <mmaltby@BrwnCald.com>
Subject: RE: Sites Strike Team Schedule - Justifications for Slips

The May RC/AB meeting is May 19th so that is the date we need to meet in EIR-370 for certification of the EIR and project approval. EIR-250 would need to be complete on May 5th.

From: Alicia Forsythe <aforsythe@sitesproject.org>
Sent: Wednesday, January 11, 2023 1:09 PM
To: Laurie Warner Herson <laurie.warner.herson@phenixenv.com>; David Hubbard <Dhubbard@BrwnCald.com>
Cc: mmaltby@brwncald.com
Subject: RE: Sites Strike Team Schedule - Justifications for Slips

Yes. Lets reduce the 80 day duration on EIR-250.

Ali

Alicia Forsythe | Environmental Planning and Permitting Manager | Sites Project Authority | 916.880.0676 | aforsythe@sitesproject.org | www.SitesProject.org

From: Laurie Warner Herson <laurie.warner.herson@phenixenv.com>
Sent: Wednesday, January 11, 2023 1:00 PM
To: David Hubbard <Dhubbard@BrwnCald.com>; Alicia Forsythe <aforsythe@sitesproject.org>
Cc: mmaltby@brwncald.com
Subject: RE: Sites Strike Team Schedule - Justifications for Slips

Ali (and others) – I think EIR-250 is the better place to reduce durations. ICF is still struggling to get us an admin Final EIR/EIS by 1/31.

From: David Hubbard <Dhubbard@BrwnCald.com>
Sent: Wednesday, January 11, 2023 12:56 PM
To: Alicia Forsythe <aforsythe@sitesproject.org>; Laurie Warner Herson <laurie.warner.herson@phenixenv.com>
Cc: Marcus Maltby <mmaltby@BrwnCald.com>
Subject: RE: Sites Strike Team Schedule - Justifications for Slips

We could also reduce the 80 day duration for EIR-250 to move back to the left.

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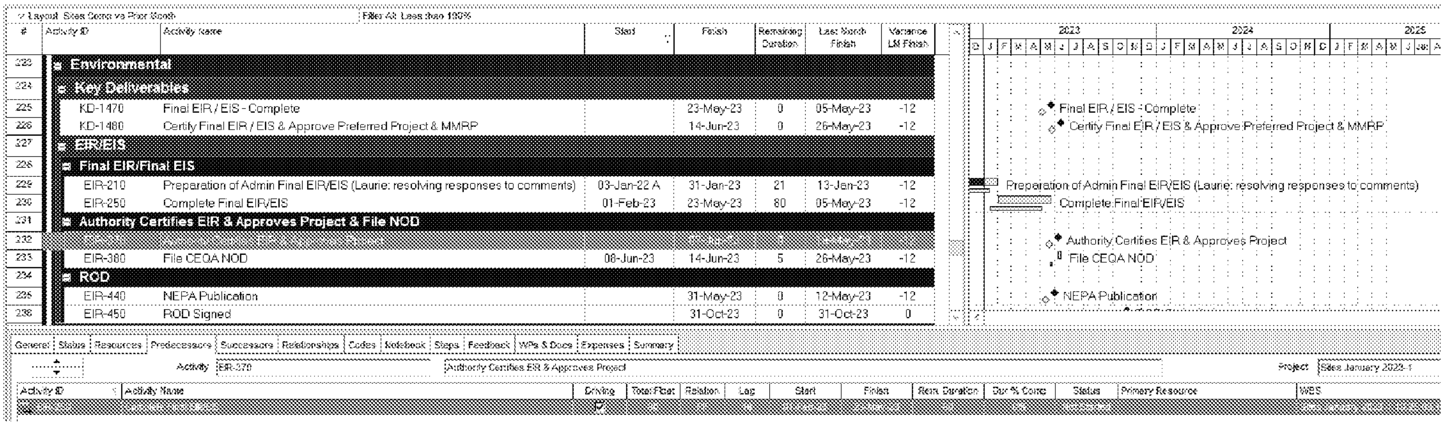
From: David Hubbard
Sent: Wednesday, January 11, 2023 2:52 PM
To: Jerry Brown <jbrown@sitesproject.org>; Alicia Forsythe <aforsythe@sitesproject.org>; Laurie Warner Herson <laurie.warner.herson@phenixenv.com>
Cc: Marcia Kivett <MKivett@sitesproject.org>; Marcus Maltby <mmaltby@BrwnCald.com>
Subject: RE: Sites Strike Team Schedule - Justifications for Slips

Well, the Authority Approval has slipped to 07-June as a result.
We have a 2 week (10 day lag) after the Final IR/EIS Complete. See below. We can reduce the lag to bring forward.
Is there any way to complete activity EIR-210 sooner? We went from 13-Jan to 31-Jan and everything moved the same 12 days as a result. Reducing the remaining duration for EIR-210 will also bring everything forward.



Layout: Sites Comp vs Prior Month | Filter: All: Less than 100%

#	Activity ID	Activity Name	Start	Finish	Remaining Duration	Last Month Finish	Variance LM Finish
223	Environmental						
224	Key Deliverables						
225	KD-1470	Final EIR / EIS - Complete		23-May-23	0	05-May-23	-12
226	KD-1480	Certify Final EIR / EIS & Approve Preferred Project & MMRP		14-Jun-23	0	26-May-23	-12
227	EIR/EIS						
228	Final EIR/Final EIS						
229	EIR-210	Preparation of Admin Final EIR/EIS (Laurie: resolving responses to comments)	03-Jan-22 A	31-Jan-23	21	13-Jan-23	-12
230	EIR-250	Complete Final EIR/EIS	01-Feb-23	23-May-23	80	05-May-23	-12
231	Authority Certifies EIR & Approves Project & File NOD						
232	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]
233	EIR-380	File CEQA NOD	08-Jun-23	14-Jun-23	5	26-May-23	-12
234	ROD						
235	EIR-440	NEPA Publication		31-May-23	0	12-May-23	-12
236	EIR-450	ROD Signed		31-Oct-23	0	31-Oct-23	0

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From: Jerry Brown <jbrown@sitesproject.org>
Sent: Wednesday, January 11, 2023 2:39 PM
To: Alicia Forsythe <aforsythe@sitesproject.org>
Cc: Marcia Kivett <MKivett@sitesproject.org>; David Hubbard <Dhubbard@BrwnCald.com>; Marcus Maltby <mmaltby@BrwnCald.com>
Subject: Re: Sites Strike Team Schedule - Justifications for Slips

Please confirm that slippage on the Final EIR/EIS does not mean the Authority approval pushes into June. We need to hold the May date firm. This was the ICF commitment last month. Please let me know and adjust this schedule update accordingly. thanks

---

From: David Hubbard <Dhubbard@BrwnCald.com>
Date: Tuesday, January 10, 2023 at 1:52 PM
To: "mmaltby@brwncald.com" <mmaltby@brwncald.com>
Cc: Jerry Brown <jbrown@sitesproject.org>, Marcia Kivett <MKivett@sitesproject.org>
Subject: Sites Strike Team Schedule - Justifications for Slips

See below for why things moved. We can discuss or alter logic if there is a need to do that.

Receive CESA ITP – Operations: Slipped 10 days as we have added 2 weeks review time after Preparation of the Permit Application.

Receive CESA ITP – Construction: Slipped 10 days as we have added 2 weeks review time after Preparation of the Permit Application.

Final Operating Agreement – Sites/DWR/Reclamation: Slipped 12 days due to Final EIR/EIS slipping by 12 days due to additional time to resolve responses to comments during Preparation of the Admin Final EIR/EIS.

Develop Benefits & Obligations Contract with Participants: Slipped 59 days (12 weeks) as it's predecessor is Formalize AB/RC Governance & Delegation of Authority for Phase 3 with Finish to Finish of 6 weeks; completion of this activity was extended from end of 2022 to end of 2023.

Final EIR/EIS – Complete: Slipped 12 days due to additional time to resolve responses to comments during Preparation of the Admin Final EIR/EIS.

Authority Certifies EIR & Approves Project: Slipped 12 days due to additional time to resolve responses to comments during Preparation of the Admin Final EIR/EIS. Predecessor is Final EIR/EIS Complete with 2 weeks lag allowed for.

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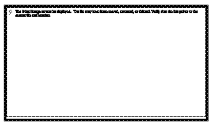

From: Sara M. Katz [skatz@katzandassociates.com]
Sent: 1/16/2023 7:12:25 AM
To: Jerry Brown [jbrown@sitesproject.org]; Kevin Spesert [kspesert@sitesproject.org]
Subject: Fwd: From Today's LA Times - Sites mention

From today's LA Times.

Sent from my iPhone

Begin forwarded

capitol journal
Playing catch-up on flood management
GEORGE SKELTON in sacramento
When Leland Stanford became California's governor in 1862, he needed a rowboat to carry him to the Capitol to be sworn in.
Sacramento's streets were flooded. In fact, much of California was. A 300-mile-long lake was created in the Central Valley from near Bakersfield to Red Bluff. At least 4,000 people were killed.
It was the largest flood in the recorded history of California, Nevada and Oregon, dumping 10 feet of water on this state over a 43-day period.
The Great Flood of 1862 followed a 20-year drought.
And it occurred half a century before gasoline-burning automobiles began spewing greenhouse gases into the atmosphere, exacerbating human-caused global warming.
Gov. Gavin Newsom seems, in every other sentence, to blame the intensity of our current storms — or any drought or wildfire — on climate change. We're getting drier and wetter and the cycles are becoming more frequent, he and experts warn.
OK, I'm no climatologist. But I do read history. And you can acknowledge history without being a climate denier. Burning fossil fuel has warmed the planet and appears to have mucked up our climate. But we'd still suffer terrible droughts and disastrous storms even if all the energy we used was carbon free.
Cycles of drought and flooding have been the California way — nature's way — for eons. There were many droughts and megafloods in California before the Industrial Revolution — before we packed nearly 40 million people into the state, making these events even more disastrous to humans.
And, of course, there were several catastrophic floods in the last century before global warming became acute.
Times columnist Gustavo Arellano wrote about the Great Flood of 1938 on Saturday.
"What Southern California has weathered so far this January has been bad but nowhere near as destructive as 1938," he reminded. All the basin's major rivers overflowed their banks. At least 87 people were killed.
At Christmastime in 1955, floods inundated much of Northern California, killing more than 60 people. At least 42 died around Yuba City and Marysville when the Feather River burst its banks.
"California has lots of extremes. We've always had more wet years and drier years than any part of the country," Jay Lund, vice director of the UC Davis Center for Watershed Sciences, once told me. "Every year we're managing for drought and for floods, and we always will."
Yes, and we've got lots of catching up to do on flood management, with or without climate change.
The 1955 flooding motivated just enough Northern California legislators and voters eager for flood control to approve new Gov. Pat Brown's then-controversial California Water Project in 1960. It included the huge Oroville Dam on the Feather River.
But the state has added little to its once-prized water system since then. Meanwhile, the population has more than doubled.
One failure is we're not capturing and storing nearly as much floodwater as we should. The primary example is in the Sacramento-San Joaquin River Delta, the source of drinking water for 27 million Californians and irrigation for 3 million acres.

Ideally, we'd be grabbing big pools of nature's gift and storing it for use in dry years. Instead, it escapes through San Francisco Bay and flows into the ocean.
One immediate reason we're capturing less water than we could is a regulation agreed to by the former Trump administration.
Under it, the "first flush" of each season's major storm is reserved for the bay. For two weeks, state and federal pumps at the southern end of the delta have been permitted to pump at only about half capacity.
The main reason is to protect endangered fish. Aggressive pumping reverses San Joaquin River flow, sucking endangered tiny smelt and little salmon into the pumps or mouths of large predator fish.
But fish aside, the reverse flows draw in salt water from the bay. And that gets pumped south into Southern California reservoirs.
"That's why we're so focused on the delta tunnel. It's going to allow us to pump large amounts of water during big winter storms without an environmental impact," says Wade Crowfoot, secretary of the state Natural Resources Agency.
Fresher Sacramento River water from the north delta would be siphoned into a 45-mile-long, 39-foot-wide tunnel ending near the southbound aqueducts. If it had been in place, Crowfoot estimates that an additional 131,000 acre-feet of floodwater could have been captured during the current storm as of late last week.
But small delta communities, local farmers and environmentalists worry that if the tunnel existed, water grabbers — meaning San Joaquin agriculture and L.A. — wouldn't just be taking stormwater. They'd also be seizing water during dry summers and droughts, leaving the delta saltier.
All that must be negotiated and litigated. If it's ever built, the $16-billion project probably couldn't be operational until at least 2040.
There also needs to be more storage room for floodwater. There's a perpetual cry for additional costly dams. But we're already dammed to the brim. There are nearly 1,500 dams in California. Practically every good site has been used.
But one sensible dam project is noncontroversial and headed for construction. It's Sites in Colusa County, an off-stream reservoir that would hold 1.5 million acre-feet of water siphoned off the nearby Sacramento River. Construction on the $4.5-billion project could begin in 2025.
Some existing dams, including San Luis in Merced County and Los Vaqueros in Contra Costa County, probably will be expanded.
But the future of storage is underground in depleted aquifers. That's a major focus of state and local governments.
Meanwhile, even with climate change, Newsom didn't need to row a skiff to his recent second inauguration at the Capitol. He was driven to the outdoor ceremony in a big SUV as storm clouds briefly parted.

K&A
KATZ & ASSOCIATES

Karen Snyder
Vice President
c: 615.604.2568
San Diego · Los Angeles · San Francisco

From: Jerry Brown [jbrown@sitesproject.org]
Sent: 1/16/2023 8:24:57 AM
To: Sara M. Katz [skatz@katzandassociates.com]; Kevin Spesert [kspesert@sitesproject.org]
Subject: Re: From Today's LA Times - Sites mention

He makes good points.

From: "Sara M. Katz" <skatz@katzandassociates.com>
Date: Monday, January 16, 2023 at 7:12 AM
To: Jerry Brown <jbrown@sitesproject.org>, Kevin Spesert <kspesert@sitesproject.org>
Subject: Fwd: From Today's LA Times - Sites mention

From today's LA Times.

Sent from my iPhone

Begin forwarded

capitol journal
Playing catch-up on flood management
GEORGE SKELTON in sacramento
When Leland Stanford became California's governor in 1862, he needed a rowboat to carry him to the Capitol to be sworn in.
Sacramento's streets were flooded. In fact, much of California was. A 300-mile-long lake was created in the Central Valley from near Bakersfield to Red Bluff. At least 4,000 people were killed.
It was the largest flood in the recorded history of California, Nevada and Oregon, dumping 10 feet of water on this state over a 43-day period.
The Great Flood of 1862 followed a 20-year drought.
And it occurred half a century before gasoline-burning automobiles began spewing greenhouse gases into the atmosphere, exacerbating human-caused global warming.
Gov. Gavin Newsom seems, in every other sentence, to blame the intensity of our current storms — or any drought or wildfire — on climate change. We're getting drier and wetter and the cycles are becoming more frequent, he and experts warn.
OK, I'm no climatologist. But I do read history. And you can acknowledge history without being a climate denier. Burning fossil fuel has warmed the planet and appears to have mucked up our climate. But we'd still suffer terrible droughts and disastrous storms even if all the energy we used was carbon free.
Cycles of drought and flooding have been the California way — nature's way — for eons. There were many droughts and megafloods in California before the Industrial Revolution — before we packed nearly 40 million people into the state, making these events even more disastrous to humans.
And, of course, there were several catastrophic floods in the last century before global warming became acute.
Times columnist Gustavo Arellano wrote about the Great Flood of 1938 on Saturday.
"What Southern California has weathered so far this January has been bad but nowhere near as destructive as 1938," he reminded. All the basin's major rivers overflowed their banks. At least 87 people were killed.
At Christmastime in 1955, floods inundated much of Northern California, killing more than 60 people. At least 42 died around Yuba City and Marysville when the Feather River burst its banks.
"California has lots of extremes. We've always had more wet years and drier years than any part of the country," Jay Lund, vice director of the UC Davis Center for Watershed Sciences, once told me. "Every year we're managing for drought and for floods, and we always will."
Yes, and we've got lots of catching up to do on flood management, with or without climate change.

The 1955 flooding motivated just enough Northern California legislators and voters eager for flood control to approve new Gov. Pat Brown's then-controversial California Water Project in 1960. It included the huge Oroville Dam on the Feather River.
But the state has added little to its once-prized water system since then. Meanwhile, the population has more than doubled.
One failure is we're not capturing and storing nearly as much floodwater as we should. The primary example is in the Sacramento-San Joaquin River Delta, the source of drinking water for 27 million Californians and irrigation for 3 million acres.
Ideally, we'd be grabbing big pools of nature's gift and storing it for use in dry years. Instead, it escapes through San Francisco Bay and flows into the ocean.
One immediate reason we're capturing less water than we could is a regulation agreed to by the former Trump administration.
Under it, the "first flush" of each season's major storm is reserved for the bay. For two weeks, state and federal pumps at the southern end of the delta have been permitted to pump at only about half capacity.
The main reason is to protect endangered fish. Aggressive pumping reverses San Joaquin River flow, sucking endangered tiny smelt and little salmon into the pumps or mouths of large predator fish.
But fish aside, the reverse flows draw in salt water from the bay. And that gets pumped south into Southern California reservoirs.
"That's why we're so focused on the delta tunnel. It's going to allow us to pump large amounts of water during big winter storms without an environmental impact," says Wade Crowfoot, secretary of the state Natural Resources Agency.
Fresher Sacramento River water from the north delta would be siphoned into a 45-mile-long, 39-foot-wide tunnel ending near the southbound aqueducts. If it had been in place, Crowfoot estimates that an additional 131,000 acre-feet of floodwater could have been captured during the current storm as of late last week.
But small delta communities, local farmers and environmentalists worry that if the tunnel existed, water grabbers — meaning San Joaquin agriculture and L.A. — wouldn't just be taking stormwater. They'd also be seizing water during dry summers and droughts, leaving the delta saltier.
All that must be negotiated and litigated. If it's ever built, the $16-billion project probably couldn't be operational until at least 2040.
There also needs to be more storage room for floodwater. There's a perpetual cry for additional costly dams. But we're already dammed to the brim. There are nearly 1,500 dams in California. Practically every good site has been used.
But one sensible dam project is noncontroversial and headed for construction. It's Sites in Colusa County, an off-stream reservoir that would hold 1.5 million acre-feet of water siphoned off the nearby Sacramento River. Construction on the $4.5-billion project could begin in 2025.
Some existing dams, including San Luis in Merced County and Los Vaqueros in Contra Costa County, probably will be expanded.
But the future of storage is underground in depleted aquifers. That's a major focus of state and local governments.
Meanwhile, even with climate change, Newsom didn't need to row a skiff to his recent second inauguration at the Capitol. He was driven to the outdoor ceremony in a big SUV as storm clouds briefly parted.

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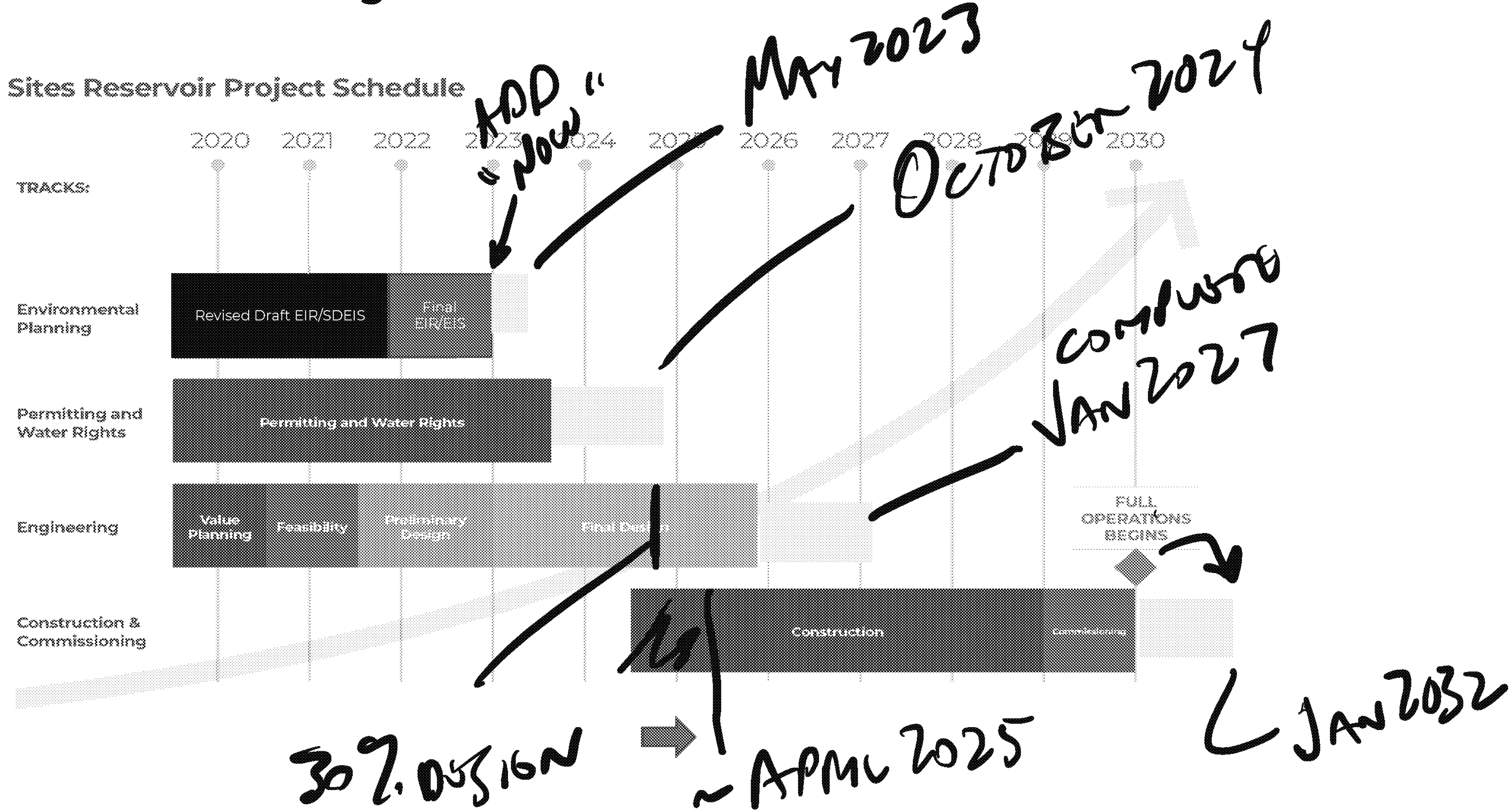
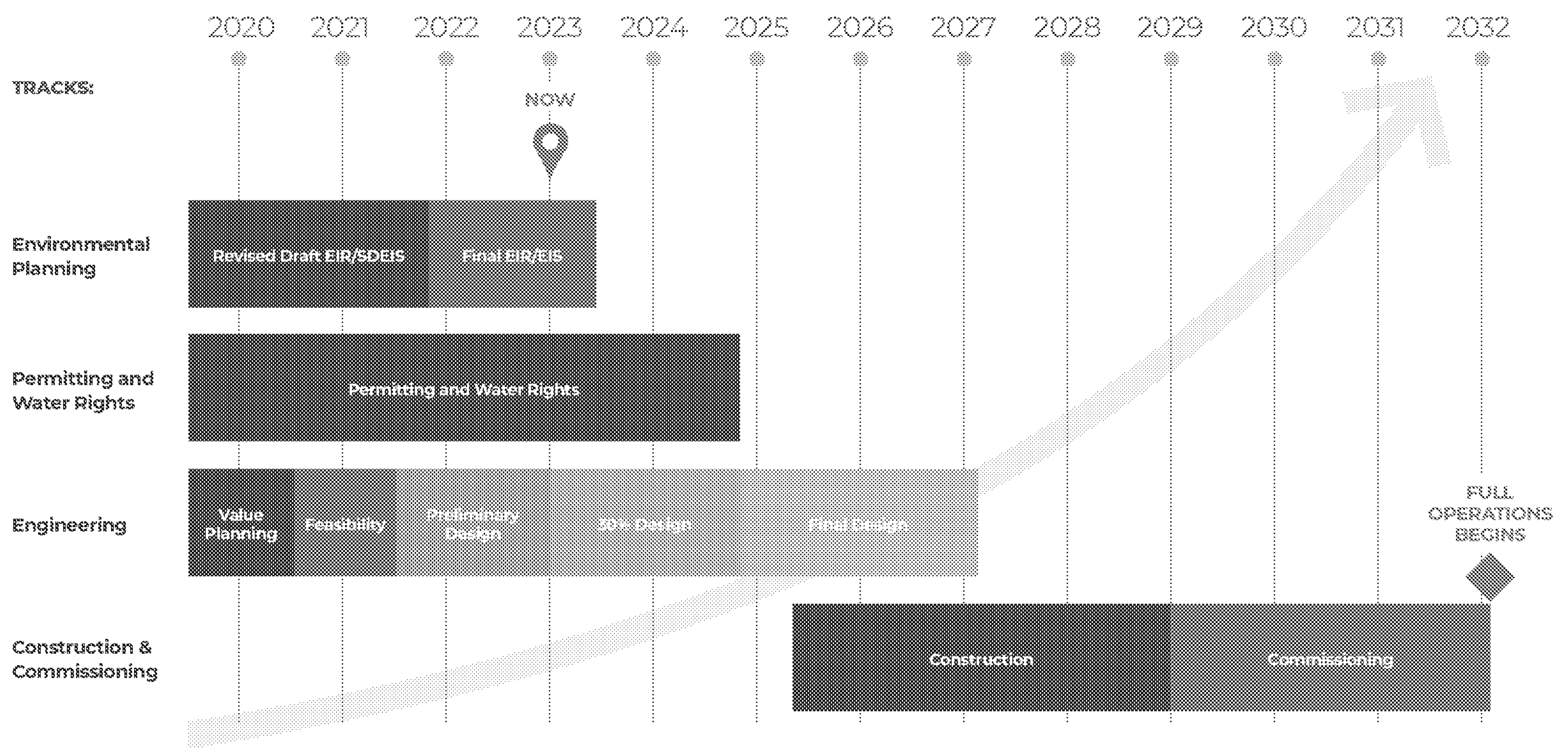
Project Schedule



Draft - Predecisional Working Document - For Discussion Purposes Only

Sites Reservoir Project Schedule



From: Ann Newton [anewton@katzandassociates.com]
Sent: 1/18/2023 12:02:47 PM
To: Jerry Brown [jbrown@sitesproject.org]; Alicia Forsythe [aforsythe@sitesproject.org]; Kevin Spesert [kspesert@sitesproject.org]
CC: Sara M. Katz [skatz@katzandassociates.com]; Quin La Capra [qlacapra@katzandassociates.com]; Sarah Rossetto [srossetto@katzandassociates.com]
Subject: RE: Sites Storm Diversion Materials for Approval

Thanks, Jerry. I was just working up a separate email to suggest a more conservative estimate as well. I had been thinking 4 people per household, but that's not accurate. We will say 2 million. Of course in reality, the water would also go to farms, the environment and businesses, but we just wanted to illustrate an example of how much water this could mean for California.

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Ann Newton
Director, Los Angeles
d: 310.774.7639
San Diego · Los Angeles · San Francisco

From: Jerry Brown <jbrown@sitesproject.org>
Sent: Wednesday, January 18, 2023 11:59 AM
To: Ann Newton <anewton@katzandassociates.com>; Alicia Forsythe <aforsythe@sitesproject.org>; Kevin Spesert <kspesert@sitesproject.org>
Cc: Sara M. Katz <skatz@katzandassociates.com>; Quin La Capra <qlacapra@katzandassociates.com>; Sarah Rossetto <srossetto@katzandassociates.com>
Subject: Re: Sites Storm Diversion Materials for Approval
Importance: Low

All looks good. On the amount of water question and % of outflow:

General rules of thumb is 2 houses use 1 acre foot over the course of a year. So 382,000 AF * 2 = 764,000 homes served for one year. Also general rule of thumb is 2.5 people per home. So 764,000 homes * 2.5 people per home = 1,910,000. So say 2 million people, not 3.

Ali doing one final check on % of outflow calc with MBK.

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Jerry, Ali and Kevin,

Attached please find three documents for your final review and approval:

- Press Release
- Social Media Posts
- Blog (to be signed by either Jerry or Ali, whoever is preferred)

Couple of quick notes.

- The press release and social media reflect Ali's edits and the final Tweets she sent us this morning.
- We would like you to confirm that you are comfortable with how we've quantified the amount of water in the headline. See comment embedded in the release.
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Ok thanks. And Ali has now confirmed the % outflow calc so all good to release ASAP. Thanks for good work!

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From: Alicia Forsythe [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=A6CDF06A7E904B65BAA21702A82AD329-AFORSYTHE]
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Subject: RE: Sites Storm Diversion Materials for Approval

Hi all – I think the press release and tweets are ready. I think there might be a little work on the blog. I can work on some mark-ups now.

Ali

Alicia Forsythe | Environmental Planning and Permitting Manager | Sites Project Authority | 916.880.0676 | aforsythe@sitesproject.org | www.SitesProject.org

From: Ann Newton <anewton@katzandassociates.com>
Sent: Wednesday, January 18, 2023 12:03 PM
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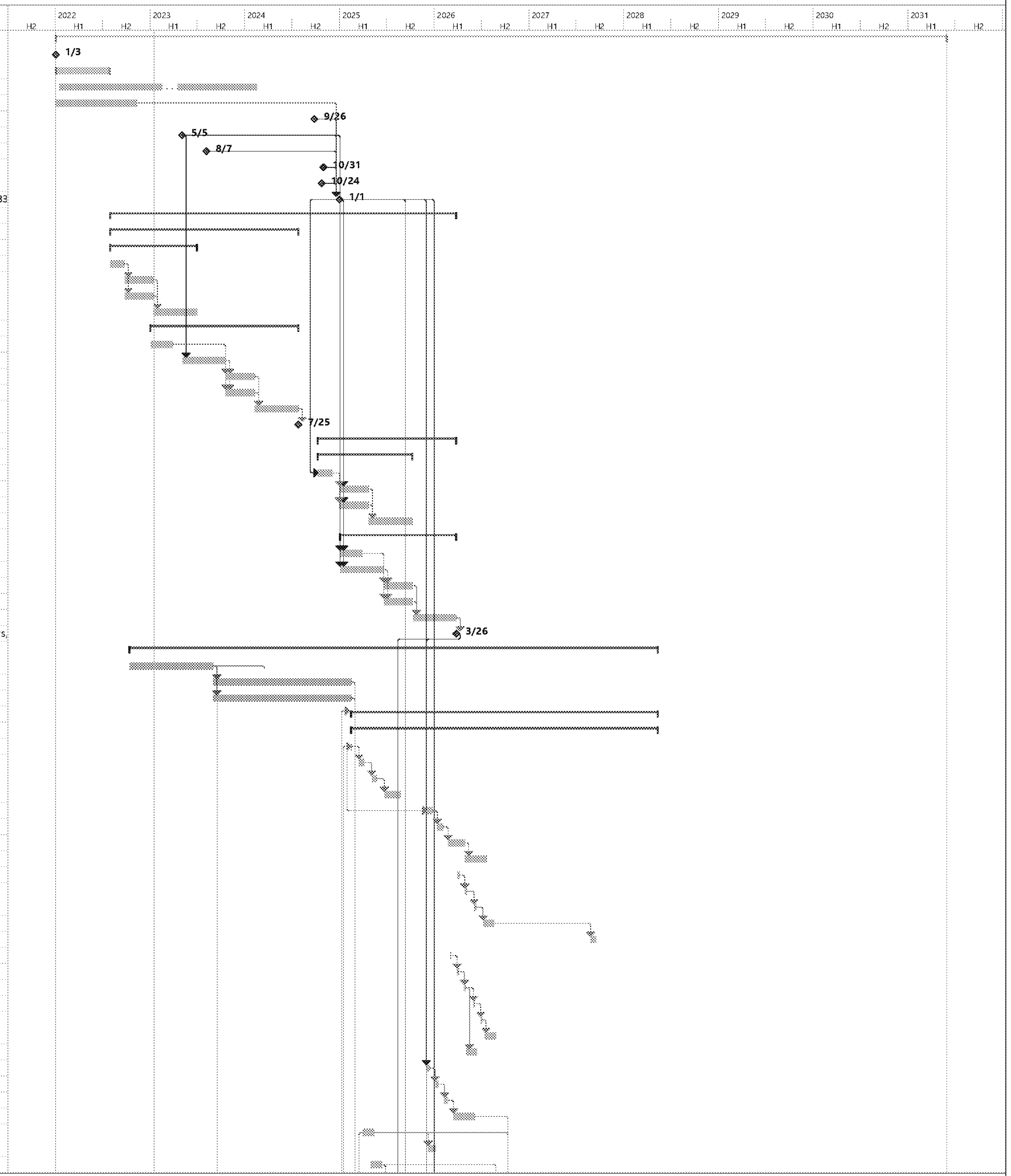
Sites Reservoir
Preliminary Construction Schedule
Maxwell - Sites Pumping and Generating (MSPG) Facilities
January 2023

ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	Successors
0		**Maxwell Sites Pumping and Generating Facilities CP2**	**2455 days?**	**Mon 1/3/22**	**Fri 5/30/31**		
1		Start Task Order 3 - Preliminary Engineering	0 days	Mon 1/3/22	Mon 1/3/22		
2		Determine Construction Packaging & Delivery Methods	149 days	Mon 1/3/22	Thu 7/28/22		
3		Real Estate Team Gain Access for Surveying & Geotech Investiga	500 days	Mon 1/17/22	Fri 2/16/24		
4		Topographic Survey and Mapping	225 days	Mon 1/3/22	Fri 11/11/22		10
5		Water Rights Permit Issued	0 days	Thu 9/26/24	Thu 9/26/24		10
6		Final EIR / EIS	0 days	Fri 5/5/23	Fri 5/5/23		10,20,33,32
7		ROD Signed	0 days	Mon 8/7/23	Mon 8/7/23		10
8		WIFEA EPA Loan Closed	0 days	Thu 10/31/24	Thu 10/31/24		10
9		Investor Commitment	0 days	Thu 10/24/24	Thu 10/24/24		10
10		NTP for 60% Design Activities	0 days	Wed 1/1/25	Wed 1/1/25	4,5,6,7,8,9	188,220,256,270,305,204,237,286,318,27SS-60 days,64,28,29,33
11		**Geotech Investigations MSPG Investigations**	**954 days**	**Mon 8/1/22**	**Thu 3/26/26**		
12		**Phase 1 Geotech investigation for Preliminary (30%) Design**	**519 days**	**Mon 8/1/22**	**Thu 7/25/24**		
13		**Federal Access (USBR)**	**240 days**	**Mon 8/1/22**	**Fri 6/30/23**		
14		Right of Entry, Negotiated	2 mons	Mon 8/1/22	Fri 9/23/22		15,16
15		Environmental Survey, Report Prep & Clearance	4 mons	Mon 9/26/22	Fri 1/13/23	14	17
16		Cultural Survey Report Prep and Clearance	4 mons	Mon 9/26/22	Fri 1/13/23	14	17
17		Geotechnical Field Investigation and Report	6 mons	Mon 1/16/23	Fri 6/30/23	15,16	
18		**Private Access**	**408 days**	**Tue 1/3/23**	**Thu 7/25/24**		
19		Right of Entry Negotiated	3 mons	Tue 1/3/23	Mon 3/27/23		21,22
20		Right of Entry Court Ordered	6 mons	Fri 5/5/23	Thu 10/19/23	6	21,22
21		Environmental Survey, Report Prep & Clearance	4 mons	Fri 10/20/23	Thu 2/8/24	19,20	23
22		Cultural Survey Report Prep and Clearance	4 mons	Fri 10/20/23	Thu 2/8/24	19,20	23
23		Geotechnical Field Investigation and Report	6 mons	Fri 2/9/24	Thu 7/25/24	21,22	24
24		P1 Geotechnical Investigation Complete	0 days	Thu 7/25/24	Thu 7/25/24	23	
25		**Phase 2 Geotech Investigation for All MSPG Design**	**382 days**	**Wed 10/9/24**	**Thu 3/26/26**		
26		**Federal Access (USBR)**	**260 days**	**Wed 10/9/24**	**Tue 10/7/25**		
27		Right of Entry, Negotiated	2 mons	Wed 10/9/24	Tue 12/3/24	10SS-60 days	28,29
28		Environmental Survey, Report Prep & Clearance	4 mons	Wed 1/1/25	Tue 4/22/25	27,10	30
29		Cultural Survey Report Prep and Clearance	4 mons	Wed 1/1/25	Tue 4/22/25	27,10	30
30		Geotechnical Field Investigation and Report	6 mons	Wed 4/23/25	Tue 10/7/25	28,29	
31		**Private Access**	**320 days**	**Fri 1/3/25**	**Thu 3/26/26**		
32		Right of Entry Negotiated	3 mons	Fri 1/3/25	Thu 3/27/25	6,10	34,35
33		Right of Entry Court Ordered	6 mons	Fri 1/3/25	Thu 6/19/25	6,10	34,35
34		Environmental Survey, Report Prep & Clearance	4 mons	Fri 6/20/25	Thu 10/9/25	32,33	36
35		Cultural Survey Report Prep and Clearance	4 mons	Fri 6/20/25	Thu 10/9/25	32,33	36
36		Geotechnical Field Investigation and Report	6 mons	Fri 10/10/25	Thu 3/26/26	34,35	37
37		P2 Geotechnical Investigation Complete	0 days	Thu 3/26/26	Thu 3/26/26	36	188FS-140 days,220FS-140 days,204FS-140 days,237FS-140 days,
38		**IO Tunnel and Tower Geotechnical Investigations**	**1455 days?**	**Fri 10/14/22**	**Thu 5/11/28**		
39		P1 Geotech Investigation (30% Cutoff)	230 days	Fri 10/14/22	Thu 8/31/23		40,41,96,97
40		P2a Geotech Investigation (Dam Foundations & Grouting)(an	76 wks	Fri 9/1/23	Thu 2/13/25	39	99
41		P2a Geotech Investigation (Roads)	76 wks	Fri 9/1/23	Thu 2/13/25	39	115,120
42		**Permitting**	**845 days?**	**Fri 2/14/25**	**Thu 5/11/28**	**100SS**	
43		**Baseline Surveys and Revised ESA Consultation**	**845 days?**	**Fri 2/14/25**	**Thu 5/11/28**		
44		Access Granted for Biological Surveys	1 day	Fri 2/14/25	Fri 2/14/25	100SS	45FS+7 days,48SS
45		Plant Survey 1	15 days	Mon 3/17/25	Fri 4/4/25	44FS+7 days	46FS+20 days
46		Plant Survey 2	15 days	Mon 5/5/25	Fri 5/23/25	45FS+20 days	47FS+20 days
47		Plant Survey 3 and Report	45 days	Mon 6/23/25	Fri 8/22/25	46FS+20 days	
48		Land Cover Verification/Aquatic Delineation #1	15 days	Tue 12/2/25	Mon 12/22/25	44SS	49FS+15 days
49		Land Cover Verification/Aquatic Delineation #2	15 days	Tue 1/13/26	Mon 2/2/26	48FS+15 days	50FS+15 days
50		Land Cover Verification/Aquatic Delineation and Report	45 days	Tue 2/24/26	Mon 4/27/26	49FS+15 days	51
51		Revise Impact Acers and Work with Agendas	60 days	Tue 4/28/26	Mon 7/20/26	50	
52		BUOW #1	5 days	Wed 4/1/26	Tue 4/7/26		53FS+15 days
53		BUOW #2	5 days	Wed 4/29/26	Tue 5/5/26	52FS+15 days	54FS+20 days
54		BUOW #3	5 days	Wed 6/3/26	Tue 6/9/26	53FS+20 days	55FS+20 days
55		BUOW #4 and Report	30 days	Wed 7/8/26	Tue 8/18/26	54FS+20 days	56
56		BUOW Relocation	15 days	Fri 8/27/27	Thu 9/16/27	55	
57		SWHA #1 and TCBB #1	5 days	Mon 3/2/26	Fri 3/6/26		58FS+15 days
58		SWHA #2 and TCBB #2	5 days	Mon 3/30/26	Fri 4/3/26	57FS+15 days	59FS+15 days
59		SWHA #3 and TCBB #3	5 days	Mon 4/27/26	Fri 5/1/26	58FS+15 days	60FS+20 days,63
60		SWHA #4	5 days	Mon 6/1/26	Fri 6/5/26	59FS+20 days	61FS+15 days
61		SWHA #5	5 days	Mon 6/29/26	Fri 7/3/26	60FS+15 days	62FS+7 days
62		SWHA #6 and Report	30 days	Wed 7/15/26	Tue 8/25/26	61FS+7 days	
63		TCBB Report	30 days	Mon 5/4/26	Fri 6/12/26	59	
64		Vernal Pool Wet Season Survey 1	10 days	Mon 12/1/25	Fri 12/12/25	10	65FS+15 days
65		Vernal Pool Wet Season Survey 2	10 days	Mon 1/5/26	Fri 1/16/26	64FS+15 days	66FS+15 days
66		Vernal Pool Wet Season Survey 3	10 days	Mon 2/9/26	Fri 2/20/26	65FS+15 days	67FS+15 days
67		Vernal Pool Wet Season Survey 4 (more may be needed)	60 days	Mon 3/16/26	Fri 6/5/26	66FS+15 days	79
68		VELB Survey and Report	30 days	Tue 4/1/25	Mon 5/12/25		69FS+150 days,79,72SS
69		VELB Transplant	20 days	Tue 12/9/25	Mon 1/5/26	68FS+150 days	
70		Bank Swallow Survey and Report	30 days	Thu 5/1/25	Wed 6/11/25		76,81

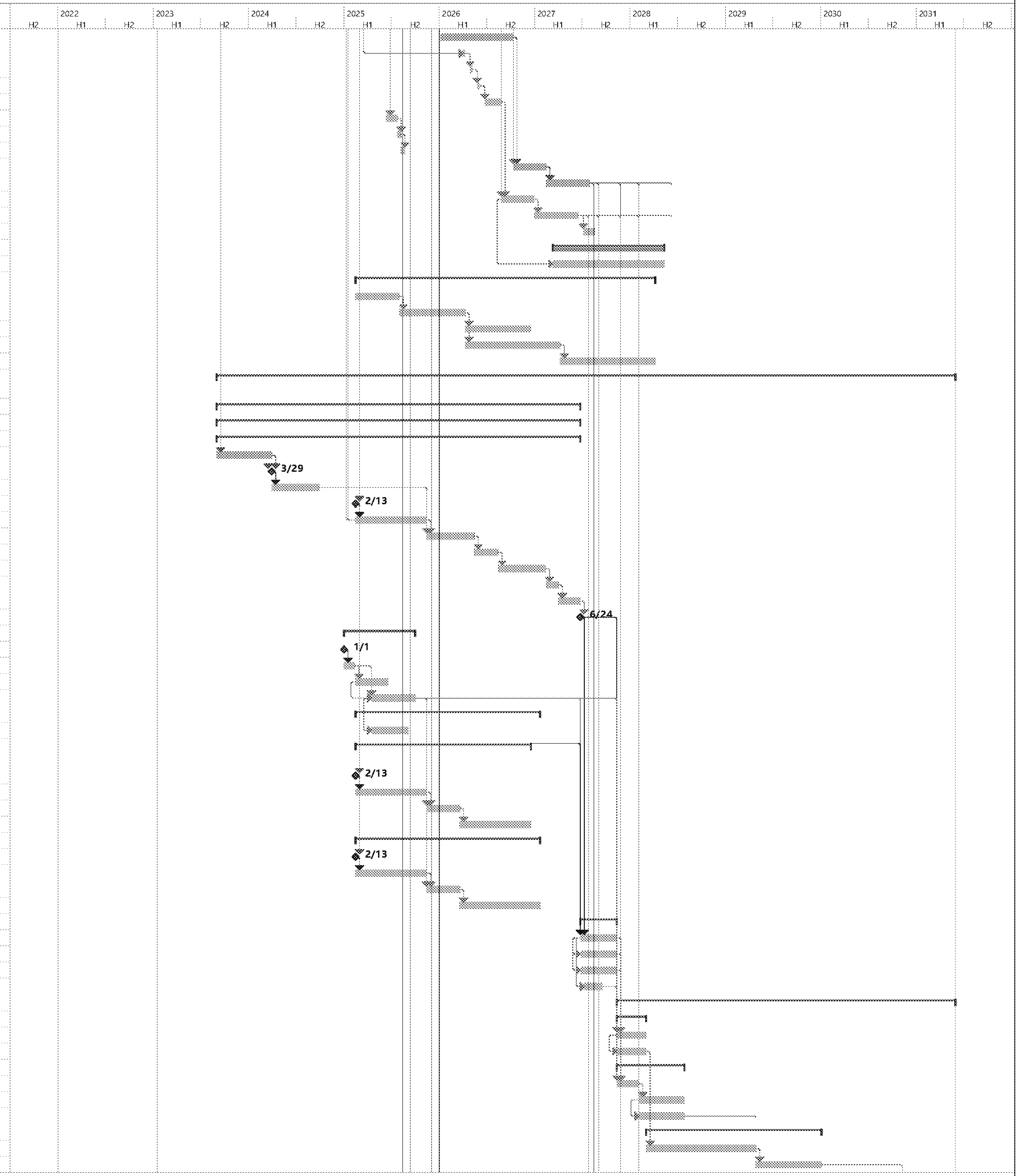


Project: Maxwell Sites Pumping
Date: Tue 1/17/23

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

Draft_0021711

ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	Successors
71		CRLF Surveys and Report	200 days	Mon 1/5/26	Fri 10/9/26		79
72		Bumble Bee Survey 1	5 days	Wed 4/1/26	Tue 4/7/26	68SS	73FS+15 days
73		Bumble Bee Survey 2	5 days	Wed 4/29/26	Tue 5/5/26	72FS+15 days	74FS+15 days
74		Bumble Bee Survey 3	5 days	Wed 5/27/26	Tue 6/2/26	73FS+15 days	75FS+15 days
75		Bumble Bee Survey 4 and Report	45 days	Wed 6/24/26	Tue 8/25/26	74FS+15 days	81
76		Badger Survey and Report	30 days	Thu 6/12/25	Wed 7/23/25	70	77
77		Bat Survey (Roosts)	10 days	Thu 7/24/25	Wed 8/6/25	76	78
78		Bat Roosts Removal	10 days	Thu 8/7/25	Wed 8/20/25	77	
79		USFWS - Amend ESA Consultation: Prepare Report and S	90 days	Mon 10/12/2€	Fri 2/12/27	67,68,71	80
80		USFWS Review and Amend ESA Permit and Take Statem	120 days	Mon 2/15/27	Fri 7/30/27	79	193,209,225,242,261,275,292,325,353,308
81		CDFW - Amend ESA ITP: Prepare Report and Submit	90 days	Wed 8/26/26	Tue 12/29/26	70,75	82,85SS
82		CDFW Review Report and Ament ITP Take Statement	120 days	Wed 12/30/2€	Tue 6/15/27	81	83FS+15 days,193,209,225,242,261,275,292,325,353,308
83		Precon Avoidance (GGS, Avian, mammal, other CEQA sp	30 days	Wed 7/7/27	Tue 8/17/27	82FS+15 days	
84		**Compensatory Mitigation**	**305 days**	**Fri 3/12/27**	**Thu 5/11/28**		
85		Secure LOC/Implement Mitigation Prior to Take	305 days	Fri 3/12/27	Thu 5/11/28	81SS	
86		**Cultural Work**	**820 days?**	**Fri 2/14/25**	**Thu 4/6/28**		
87		Prepare and Consult on Construction Phase Work Plar	120 days	Fri 2/14/25	Thu 7/31/25		88
88		Cultural Survey - with Fee Title	180 days	Fri 8/1/25	Thu 4/9/26	87	89,90
89		Testing and Evaluation of Resources	180 days	Fri 4/10/26	Thu 12/17/26	88	
90		Develop Treatment Plan and Implementation	260 days	Fri 4/10/26	Thu 4/8/27	88	91
91		Implement Avoidance/Minimization Activities During	260 days?	Fri 4/9/27	Thu 4/6/28	90	
92		**CONSTRUCTION PACKAGE #1 - RESERVOIR FACILITIES (Rev 7 10-25-22)**	**2021 days**	**Fri 9/1/23**	**Fri 5/30/31**		
93		**Engineering - Dams**	**995 days**	**Fri 9/1/23**	**Thu 6/24/27**		
94		**Inlet-Outlet Design**	**995 days**	**Fri 9/1/23**	**Thu 6/24/27**		
95		**Inlet-Outlet Design (CP#2 - MSPG)**	**995 days**	**Fri 9/1/23**	**Thu 6/24/27**		
96		Inlet-Outlet 30% Design	151 days	Fri 9/1/23	Fri 3/29/24	39	97
97		Inlet-Outlet Package Submittal	0 days	Fri 3/29/24	Fri 3/29/24	96,39	98
98		DSOD Review of Inlet-Outlet 30% Design	26 wks	Mon 4/1/24	Fri 9/27/24	97	101
99		Inlet-Outlet Geotech Data	0 days	Thu 2/13/25	Thu 2/13/25	40	100
100		Inlet-Outlet 60% Design	39 wks	Fri 2/14/25	Thu 11/13/25	99	101,44SS,42SS
101		DSOD Review of Inlet-Outlet 60% Design	26 wks	Fri 11/14/25	Thu 5/14/26	98,100	102
102		Inlet-Outlet 90% Design	13 wks	Fri 5/15/26	Thu 8/13/26	101	103
103		DSOD Review of Inlet-Outlet 90% Design	26 wks	Fri 8/14/26	Thu 2/11/27	102	104
104		Inlet-Outlet 100% Design	7 wks	Fri 2/12/27	Thu 4/1/27	103	105
105		DSOD Review of Inlet-Outlet 100% Design Package	12 wks	Fri 4/2/27	Thu 6/24/27	104	106
106		Inlet-Outlet DSOD Approval Received	0 days	Thu 6/24/27	Thu 6/24/27	105	131,125,134
107		**CMAR Procurement**	**195 days**	**Wed 1/1/25**	**Tue 9/30/25**		
108		Award CMAR Contract	0 days	Wed 1/1/25	Wed 1/1/25		109
109		Notice to Proceed	6 wks	Wed 1/1/25	Tue 2/11/25	108	111,110
110		Early Submittals And Approvals - Dams and I/O	90 days	Wed 2/12/25	Tue 6/17/25	109	111SS+45 days
111		CMAR Mobilization	6 mons	Wed 4/16/25	Tue 9/30/25	109,110SS+45 days	117,113SS,122,131,125,134
112		**Roads, Bridges, Access, and Site Development**	**505 days**	**Thu 2/13/25**	**Thu 1/21/27**		
113		Early Site Access and Staging Development	100 days	Wed 4/16/25	Tue 9/2/25	111SS	
114		**Southern Construction Access Roads (Maxwell-Sites, Shoo-fly, A-1)**	**480 days**	**Thu 2/13/25**	**Thu 12/17/26**		**125**
115		Geotechnical Data	0 days	Thu 2/13/25	Thu 2/13/25	41	116
116		Final Design	39 wks	Fri 2/14/25	Thu 11/13/25	115	117
117		Procurement and NTP	90 days	Fri 11/14/25	Thu 3/19/26	111,116	118
118		Southern Construction Access Roads (Maxwell-Sites, Shc	195 days	Fri 3/20/26	Thu 12/17/26	117	
119		**Ancillary Roads B1, B2, C1, C2, Comm N., Comm South**	**505 days**	**Thu 2/13/25**	**Thu 1/21/27**		
120		Geotechnical Data	0 days	Thu 2/13/25	Thu 2/13/25	41	121
121		Final Design	39 wks	Fri 2/14/25	Thu 11/13/25	120	122
122		Procurement and NTP	90 days	Fri 11/14/25	Thu 3/19/26	111,121	123
123		Ancillary Roads B1, B2, C1, C2, Comm N., Comm South	220 days	Fri 3/20/26	Thu 1/21/27	122	
124		**Inlet-Outlet Preliminary Work (CP#2 - MSPG)**	**100 days**	**Fri 6/25/27**	**Thu 11/11/27**		
125		Inlet-Outlet Access and Staging	100 days	Fri 6/25/27	Thu 11/11/27	106,111,114	126SS,128SS+10 days,127SS,131,134
126		Erosion and Sediment Control	100 days	Fri 6/25/27	Thu 11/11/27	125SS	131
127		Clearing / Grubbing Topsoil Salvage from Work Areas	100 days	Fri 6/25/27	Thu 11/11/27	125SS	131
128		Demolition	50 days	Fri 7/9/27	Thu 9/16/27	125SS+10 days	131
129		**Inlet Outlet Facilities (CP#2 - MSPG)**	**926 days**	**Fri 11/12/27**	**Fri 5/30/31**		
130		**Develop Downstream Portal**	**80 days**	**Fri 11/12/27**	**Thu 3/2/28**		
131		Downstream Portal Excavation	80 days	Fri 11/12/27	Thu 3/2/28	106,111,125,126,127,128	132SS
132		Downstream Portal Rock Bolting	80 days	Fri 11/12/27	Thu 3/2/28	131SS	138
133		**Develop Upstream Portal**	**185 days**	**Fri 11/12/27**	**Thu 7/27/28**		
134		Intake Channel Excavation	60 days	Fri 11/12/27	Thu 2/3/28	106,111,125	135
135		Upstream Portal Excavation	125 days	Fri 2/4/28	Thu 7/27/28	134	136SS
136		Upstream Portal Rock Bolting	125 days	Fri 2/4/28	Thu 7/27/28	135SS	141
137		**Tunnels Excavation and Lining (Double Shift)**	**480 days**	**Fri 3/3/28**	**Thu 1/3/30**		
138		Tunnel Excavation - Double Shift	300 days	Fri 3/3/28	Thu 4/26/29	132	139,141
139		Tunnel Lining	180 days	Fri 4/27/29	Thu 1/3/30	138	145

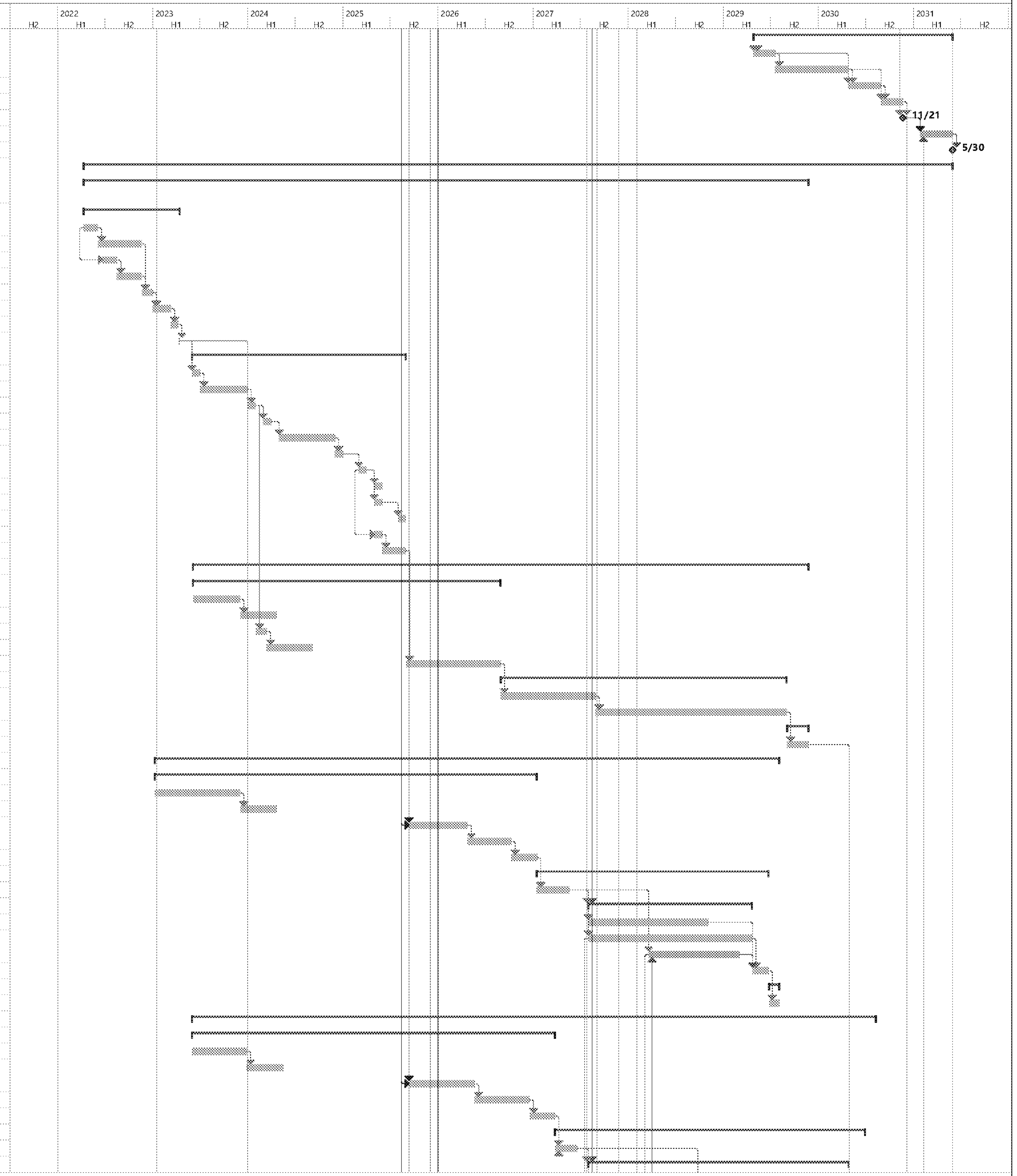


Project: Maxwell Sites Pumping
Date: Tue 1/17/23

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

Draft_0021712

ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	Successors
140		**Intake and Outlet Structures**	**546 days**	**Fri 4/27/29**	**Fri 5/30/31**		
141		Intake Structure Foundation	60 days	Fri 4/27/29	Thu 7/19/29	136,138	142,143
142		Intake Structure Concrete	200 days	Fri 7/20/29	Thu 4/25/30	141	144,143
143		Intake Structure Gates and Mechanical	90 days	Fri 4/26/30	Thu 8/29/30	141,142	144
144		I/O Completion and Restoration	60 days	Fri 8/30/30	Thu 11/21/30	142,143	145,230
145		Inlet-Outlet Ready for Commissioning	0 days	Thu 11/21/30	Thu 11/21/30	139,144	146
146		Inlet-Outlet Startup and Commissioning	90 days	Mon 1/27/31	Fri 5/30/31	145,265	147
147		Inlet-Outlet Completion	0 days	Fri 5/30/31	Fri 5/30/31	146	
148		**CONSTRUCTION PACKAGE #2 - MSPG FACILITIES**	**2385 days**	**Mon 4/11/22**	**Fri 5/30/31**		
149		**POWER INTERCONNECTION (CAISO / PG&E DESIGN AND CONSTRUCTION)**	**1990 days**	**Mon 4/11/22**	**Fri 11/23/29**		
150		**Prepare & Submit CAISO Package**	**265 days**	**Mon 4/11/22**	**Fri 4/14/23**		
151		Prepare Pump/Motor Package for Vendors to obtain Dat	40 days	Mon 4/11/22	Fri 6/3/22		152,153SS
152		Pump Vendors Prepare & Send Data	120 days	Mon 6/6/22	Fri 11/18/22	151	155
153		Prepare Hydropower Generator/Turbine Package for Ve	40 days	Wed 6/22/22	Tue 8/16/22	151SS	154
154		Generator/Turbine Vendors Prepare & Send Data	68 days	Wed 8/17/22	Fri 11/18/22	153	155
155		HC Engineering Team provide info to ZGlobal	30 days	Mon 11/21/22	Fri 12/30/22	152,154	156
156		ZGlobal run models and prepare CAISO package	50 days	Mon 1/2/23	Fri 3/10/23	155	157
157		Sites Review CAISO Package & Approve	20 days	Mon 3/13/23	Fri 4/7/23	156	158
158		ZGlobal Submit CAISO Package	5 days	Mon 4/10/23	Fri 4/14/23	157	160FS+33 days,303FF+30 days,254FF+30 days
159		**Respond to CAISO**	**587 days**	**Thu 6/1/23**	**Fri 8/29/25**		
160		Scoping Meeting	22 days	Thu 6/1/23	Fri 6/30/23	158FS+33 days	161
161		Phase 1 Study	130 days	Mon 7/3/23	Fri 12/29/23	160	162
162		Phase 1 Results Meeting	22 days	Mon 1/1/24	Tue 1/30/24	161	163FS+22 days,176
163		First Finanical Security Posting	21 days	Fri 3/1/24	Fri 3/29/24	162FS+22 days	164FS+22 days
164		Phase II Study	153 days	Wed 5/1/24	Fri 11/29/24	163FS+22 days	165
165		Phase II Results Meeting	22 days	Mon 12/2/24	Tue 12/31/24	164	166FS+43 days
166		Transmission Plan Deliverability (Resource Adequacy Prc	21 days	Mon 3/3/25	Mon 3/31/25	165FS+43 days	167FS+22 days,168FS+22 days,170SS+43 days
167		Second Financial Security Posting	22 days	Thu 5/1/25	Fri 5/30/25	166FS+22 days	
168		Draft Impact Analysis Issues	22 days	Thu 5/1/25	Fri 5/30/25	166FS+22 days	169FS+44 days
169		Reassessment Results	21 days	Fri 8/1/25	Fri 8/29/25	168FS+44 days	
170		Receive Draft Interconnection Agreement from CAISO	22 days	Thu 5/1/25	Fri 5/30/25	166SS+43 days	171
171		Negotiate Interconnection Agreement	65 days	Mon 6/2/25	Fri 8/29/25	170	178
172		**PG&E Point of Interconnection Substation**	**1690 days**	**Mon 6/5/23**	**Fri 11/23/29**		
173		**Engineering**	**845 days**	**Mon 6/5/23**	**Fri 8/28/26**		
174		Preliminary Design 30% (by HC)	130 days	Mon 6/5/23	Fri 12/1/23		175
175		Class 3 Cost Estimate (by HC)	100 days	Mon 12/4/23	Fri 4/19/24	174	
176		Establish E&P Agreement with PG&E	30 days	Wed 1/31/24	Tue 3/12/24	162	177
177		Preliminary Design (30%)	125 days	Wed 3/13/24	Tue 9/3/24	176	
178		Final 60%, 90%, 100% Design - by PG&E	260 days	Mon 9/1/25	Fri 8/28/26	171	180
179		**Construction - by PG&E**	**785 days**	**Mon 8/31/26**	**Fri 8/31/29**		
180		Procure Equipment	260 days	Mon 8/31/26	Fri 8/27/27	178	181
181		Construction	525 days	Mon 8/30/27	Fri 8/31/29	180	183
182		**Commissioning**	**60 days**	**Mon 9/3/29**	**Fri 11/23/29**		
183		Commission	60 days	Mon 9/3/29	Fri 11/23/29	181	213
184		**Funks/TRR Pipelines (DSOD Jurisdictional)**	**1715 days**	**Mon 1/9/23**	**Fri 8/3/29**		
185		**Engineering**	**1049 days**	**Mon 1/9/23**	**Thu 1/14/27**		
186		Preliminary (30%)	235 days	Mon 1/9/23	Fri 12/1/23		187
187		Class 3 Cost Estimate	100 days	Mon 12/4/23	Fri 4/19/24	186	
188		Final 60% Design	160 days	Fri 9/12/25	Thu 4/23/26	10,37FS-140 days	189
189		Final 90% Design	120 days	Fri 4/24/26	Thu 10/8/26	188	190
190		Final 100% Design	70 days	Fri 10/9/26	Thu 1/14/27	189	192
191		**Construction**	**636 days**	**Fri 1/15/27**	**Fri 6/22/29**		
192		Submittals	90 days	Fri 1/15/27	Thu 5/20/27	190	194,195,196
193		**Field Construction**	**450 days**	**Mon 8/2/27**	**Fri 4/20/29**	**80,82**	
194		Structures	330 days	Mon 8/2/27	Fri 11/3/28	192	197
195		Pipelines	450 days	Mon 8/2/27	Fri 4/20/29	192	197,212SS+250 days
196		Pipelines in Reservoir	250 days	Mon 3/20/28	Fri 3/2/29	192,229	197,212SS+250 days
197		Testing	45 days	Mon 4/23/29	Fri 6/22/29	194,195,196	199
198		**Commissioning**	**30 days**	**Mon 6/25/29**	**Fri 8/3/29**		
199		Commission	30 days	Mon 6/25/29	Fri 8/3/29	197	
200		**Transmission Powerlines**	**1877 days**	**Thu 6/1/23**	**Fri 8/9/30**		
201		**Engineering**	**996 days**	**Thu 6/1/23**	**Thu 3/25/27**		
202		Preliminary (30%)	150 days	Thu 6/1/23	Wed 12/27/23		203
203		Class 3 Cost Estimate	100 days	Thu 12/28/23	Wed 5/15/24	202	
204		Final 60% Design	180 days	Fri 9/12/25	Thu 5/21/26	10,37FS-140 days	205
205		Final 90% Design	150 days	Fri 5/22/26	Thu 12/17/26	204	206
206		Final 100% Design	70 days	Fri 12/18/26	Thu 3/25/27	205	208
207		**Construction**	**851 days**	**Fri 3/26/27**	**Fri 6/28/30**		
208		Submittals	60 days	Fri 3/26/27	Thu 6/17/27	206,239	210,211
209		**Field Construction**	**715 days**	**Mon 8/2/27**	**Fri 4/26/30**	**80,82**	



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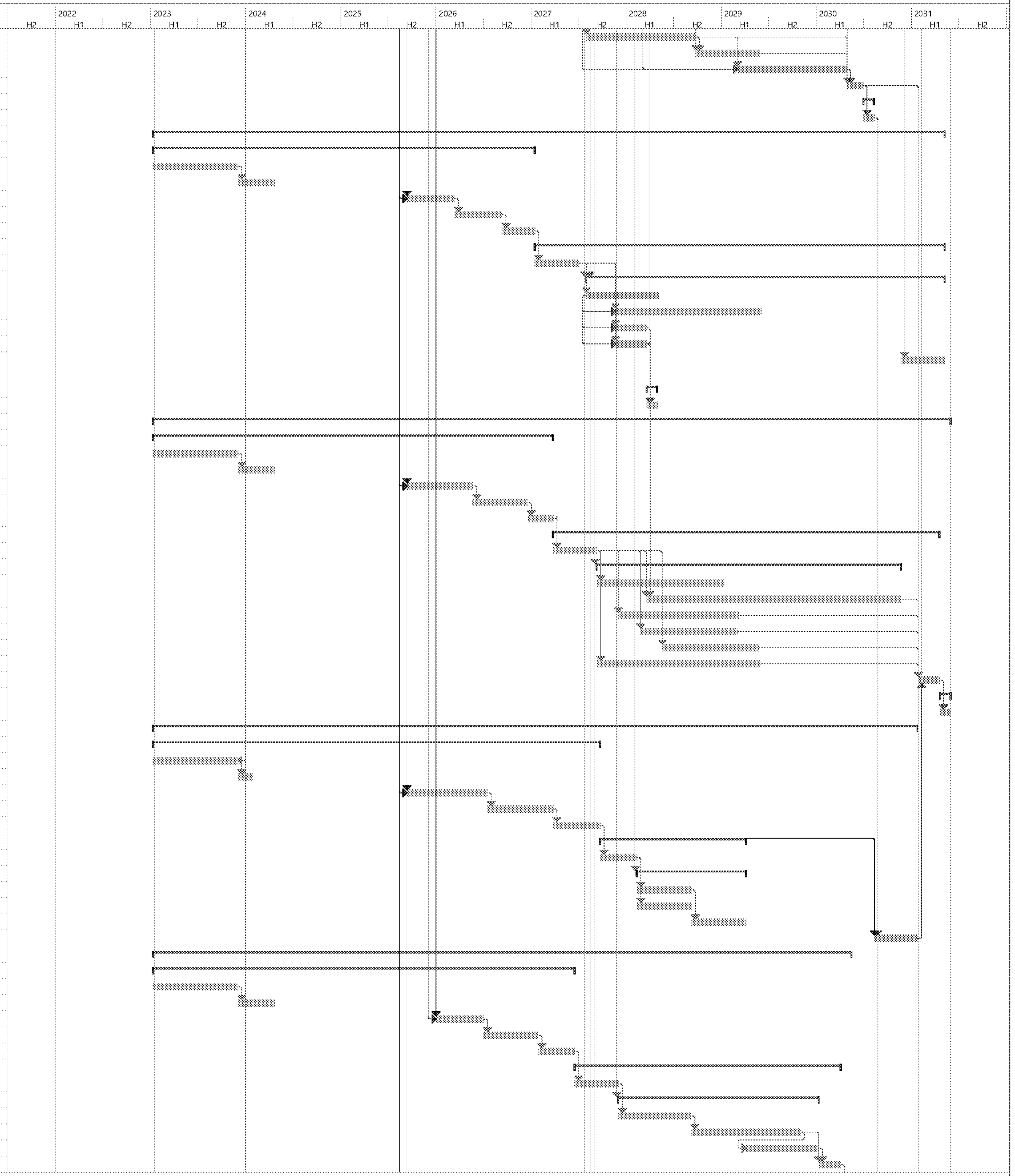
Task	Summary	Inactive Milestone	Duration-only	Start-only	External Milestone	Critical Split									
Split	Project Summary	Inactive Summary	Manual Summary Rollup	Finish-only	Deadline	Progress									
Milestone	Inactive Task	Manual Task	Manual Summary	External Tasks	Critical	Manual Progress									

Draft_0021713

Sites Reservoir
Preliminary Construction Schedule
Maxwell - Sites Pumping and Generating (MSPG) Facilities
January 2023

ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	Successors
210		Procurement	300 days	Mon 8/2/27	Fri 9/22/28	208	211,213,212
211		Towers/Powerlines to POI	175 days	Mon 9/25/28	Fri 5/25/29	208,210	213
212		Towers/Powerlines Funks/TRR	300 days	Mon 3/5/29	Fri 4/26/30	195SS+250 days,210,196SS+250 days	213
213		Testing	45 days	Mon 4/29/30	Fri 6/28/30	210,211,212,183	215,298,249
214		**Commissioning**	**30 days**	**Mon 7/1/30**	**Fri 8/9/30**		
215		Commission	30 days	Mon 7/1/30	Fri 8/9/30	213	265,313
216		**Funks Reservoir**	**2174 days**	**Mon 1/9/23**	**Thu 5/8/31**		
217		**Engineering**	**1049 days**	**Mon 1/9/23**	**Thu 1/14/27**		
218		Preliminary Design (30%)	235 days	Mon 1/9/23	Fri 12/1/23		219
219		Class 3 Cost Estimate	100 days	Mon 12/4/23	Fri 4/19/24	218	
220		Final 60% Design	130 days	Fri 9/12/25	Thu 3/12/26	10,37FS-140 days	221
221		Final 90% Design	130 days	Fri 3/13/26	Thu 9/10/26	220	222
222		Final 100% Design	90 days	Fri 9/11/26	Thu 1/14/27	221	224
223		**Construction**	**1125 days**	**Fri 1/15/27**	**Thu 5/8/31**		
224		Submittals	120 days	Fri 1/15/27	Thu 7/1/27	222	226,227,228,229
225		**Field Construction**	**984 days**	**Mon 8/2/27**	**Thu 5/8/31**	**80,82**	
226		Haulroads	200 days	Mon 8/2/27	Fri 5/5/28	224	227SS+80 days,228SS+80 days,229SS+80 days
227		Initial Sediment Removal	400 days	Mon 11/22/27	Fri 6/1/29	224,226SS+80 days	
228		PGP Cofferdams (build)	85 days	Mon 11/22/27	Fri 3/17/28	224,226SS+80 days	244
229		Pipeline Cofferdams (build)	85 days	Mon 11/22/27	Fri 3/17/28	224,226SS+80 days	232,196
230		Final Sediment Removal (After I/O and Golden Gate Dam nearly complete)	120 days	Fri 11/22/30	Thu 5/8/31	144	
231		**Commissioning**	**30 days**	**Mon 3/20/28**	**Fri 4/28/28**		
232		Commission	30 days	Mon 3/20/28	Fri 4/28/28	229	
233		**Funks Pumping Generating Plant**	**2190 days**	**Mon 1/9/23**	**Fri 5/30/31**		
234		**Engineering**	**1099 days**	**Mon 1/9/23**	**Thu 3/25/27**		
235		Preliminary (30%)	235 days	Mon 1/9/23	Fri 12/1/23		236
236		Class 3 Cost Estimate	100 days	Mon 12/4/23	Fri 4/19/24	235	
237		Final 60% Design	180 days	Fri 9/12/25	Thu 5/21/26	10,37FS-140 days	238
238		Final 90% Design	150 days	Fri 5/22/26	Thu 12/17/26	237	239
239		Final 100% Design	70 days	Fri 12/18/26	Thu 3/25/27	238	208,241
240		**Construction**	**1061 days**	**Fri 3/26/27**	**Fri 4/18/31**		
241		Submittals	120 days	Fri 3/26/27	Thu 9/9/27	239	243,244,245FS+60 days,246FS+120 days,248,247FS+180 days
242		**Field Construction**	**836 days**	**Fri 9/10/27**	**Fri 11/22/30**	**80,82**	
243		Large Equipment Procurement	350 days	Fri 9/10/27	Thu 1/11/29	241	
244		Pump Generating Plant Structure	700 days	Mon 3/20/28	Fri 11/22/30	241,228	249
245		Turbine Structure	330 days	Fri 12/3/27	Thu 3/8/29	241FS+60 days	249
246		Energy Dissipation Valve Structure	265 days	Fri 2/25/28	Thu 3/1/29	241FS+120 days	249
247		Electrical Building	265 days	Fri 5/19/28	Thu 5/24/29	241FS+180 days	249
248		Site Electrical and PGP Sitework	450 days	Fri 9/10/27	Thu 5/31/29	241	249
249		Testing	60 days	Mon 1/27/31	Fri 4/18/31	248,244,245,247,246,213,265	251
250		**Commissioning**	**30 days**	**Mon 4/21/31**	**Fri 5/30/31**		
251		Commission	30 days	Mon 4/21/31	Fri 5/30/31	249	
252		**Funks Substation**	**2100 days**	**Mon 1/9/23**	**Fri 1/24/31**		
253		**Engineering (Excludes PG&E)**	**1229 days**	**Mon 1/9/23**	**Thu 9/23/27**		
254		Design 30%	235 days	Mon 1/9/23	Fri 12/1/23	158FF+30 days	255
255		Class 3 Cost Estimate	40 days	Mon 12/4/23	Fri 1/26/24	254	
256		Final 60% Design	220 days	Fri 9/12/25	Thu 7/16/26	10,37FS-140 days	257
257		Final 90% Design	180 days	Fri 7/17/26	Thu 3/25/27	256	258
258		Final 100% Design	130 days	Fri 3/26/27	Thu 9/23/27	257	260
259		**Construction**	**400 days**	**Fri 9/24/27**	**Thu 4/5/29**		**265**
260		Submittals	100 days	Fri 9/24/27	Thu 2/10/28	258	263,262
261		**Field Construction**	**300 days**	**Fri 2/11/28**	**Thu 4/5/29**	**80,82**	
262		Earthwork/Pad Prep	150 days	Fri 2/11/28	Thu 9/7/28	260	264
263		Large Equipment Procurement	150 days	Fri 2/11/28	Thu 9/7/28	260	
264		Breaker Substation	150 days	Fri 9/8/28	Thu 4/5/29	262	
265		Commissioning	120 days	Mon 8/12/30	Fri 1/24/31	259,215	249,146
266		**TRR West Reservoir**	**1918 days**	**Mon 1/9/23**	**Wed 5/15/30**		
267		**Engineering**	**1158 days**	**Mon 1/9/23**	**Wed 6/16/27**		
268		Preliminary (30%)	235 days	Mon 1/9/23	Fri 12/1/23		269
269		Class 3 Cost Estimate	100 days	Mon 12/4/23	Fri 4/19/24	268	
270		Final 60% Design	130 days	Thu 1/1/26	Wed 7/1/26	10,37FS-140 days	271
271		Final 90% Design	150 days	Thu 7/2/26	Wed 1/27/27	270	272
272		Final 100% Design	100 days	Thu 1/28/27	Wed 6/16/27	271	274
273		**Construction**	**730 days**	**Thu 6/17/27**	**Wed 4/3/30**		
274		Submittals	120 days	Thu 6/17/27	Wed 12/1/27	272	276
275		**Field Construction**	**550 days**	**Thu 12/2/27**	**Wed 1/9/30**	**80,82**	
276		Haulroads	200 days	Thu 12/2/27	Wed 9/6/28	274	277
277		Earthwork/Structures	300 days	Thu 9/7/28	Wed 10/31/29	276	278FS-1200 hrs,279
278		Subgrade and Liner	200 days	Thu 4/5/29	Wed 1/9/30	277FS-1200 hrs	279
279		Testing	60 days	Thu 1/10/30	Wed 4/3/30	277,278	281



Project: Maxwell Sites Pumping
Date: Tue 1/17/23

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

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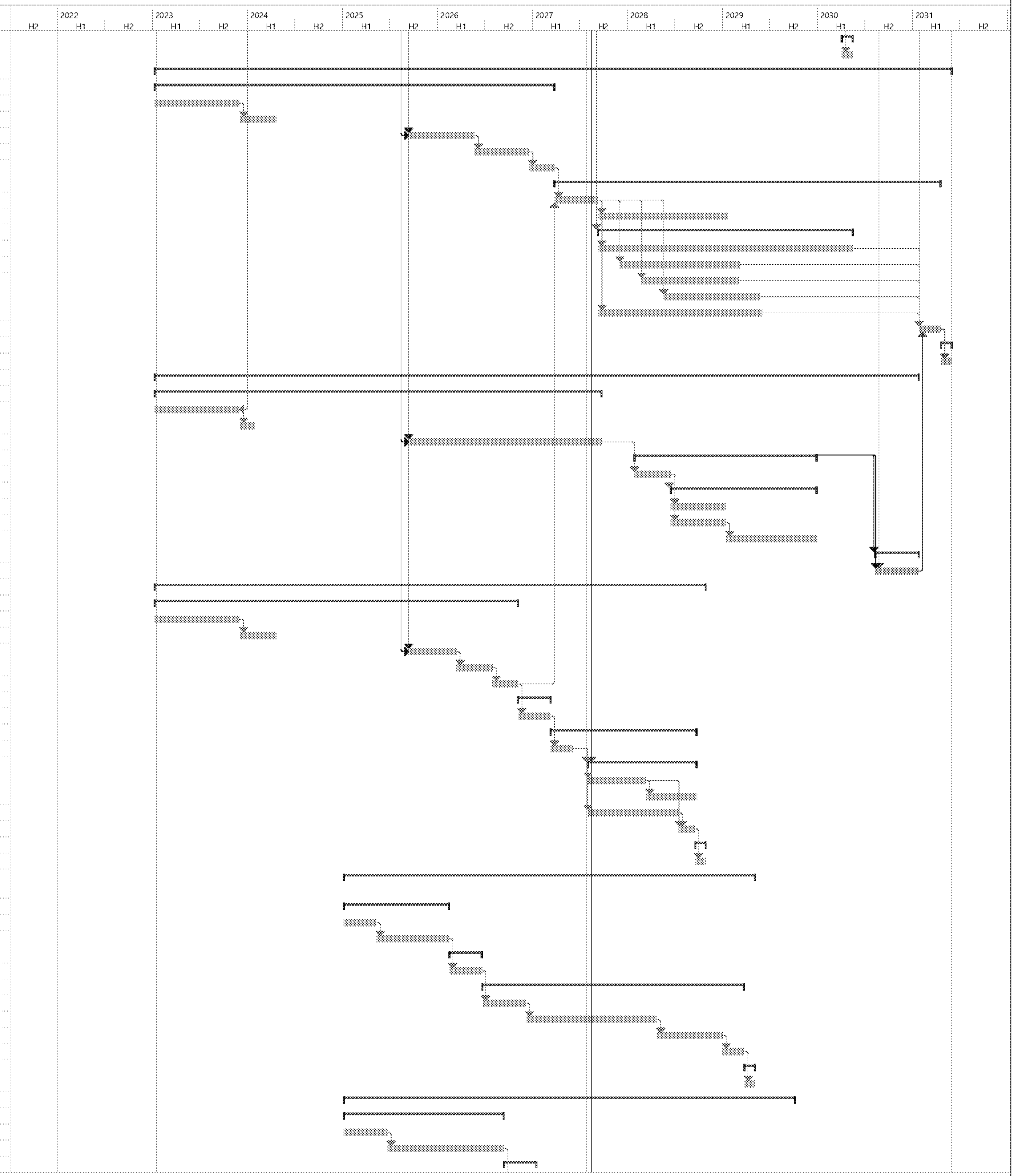
Sites Reservoir
Preliminary Construction Schedule
Maxwell - Sites Pumping and Generating (MSPG) Facilities
January 2023

ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	Successors
280		**Commissioning**	**30 days**	**Thu 4/4/30**	**Wed 5/15/30**		
281		Commission	30 days	Thu 4/4/30	Wed 5/15/30	279	
282		**TRR West Pumping Generating Plant**	**2190 days**	**Mon 1/9/23**	**Fri 5/30/31**		
283		**Engineering**	**1099 days**	**Mon 1/9/23**	**Thu 3/25/27**		
284		Preliminary (30%)	235 days	Mon 1/9/23	Fri 12/1/23		285
285		Class 3 Cost Estimate	100 days	Mon 12/4/23	Fri 4/19/24	284	
286		Final 60% Design	180 days	Fri 9/12/25	Thu 5/21/26	10,37FS-140 days	287
287		Final 90% Design	150 days	Fri 5/22/26	Thu 12/17/26	286	288
288		Final 100% Design	70 days	Fri 12/18/26	Thu 3/25/27	287	290
289		**Construction**	**1061 days**	**Fri 3/26/27**	**Fri 4/18/31**		
290		Submittals	120 days	Fri 3/26/27	Thu 9/9/27	288,320	291,293,294FS+60 days,297,295FS+120 days,296FS+180 days
291		Large Equipment Procurement	355 days	Fri 9/10/27	Thu 1/18/29	290	
292		**Field Construction**	**700 days**	**Fri 9/10/27**	**Thu 5/16/30**	**80,82**	
293		Pump Generating Plant Structure	700 days	Fri 9/10/27	Thu 5/16/30	290	298
294		Turbine Structure	330 days	Fri 12/3/27	Thu 3/8/29	290FS+60 days	298
295		Energy Dissipation Valve Structure	265 days	Fri 2/25/28	Thu 3/1/29	290FS+120 days	298
296		Electrical Building	265 days	Fri 5/19/28	Thu 5/24/29	290FS+180 days	298
297		Site Electrical and PGP Sitework	450 days	Fri 9/10/27	Thu 5/31/29	290	298
298		Testing	60 days	Mon 1/27/31	Fri 4/18/31	213,296,293,294,295,297,313	300
299		**Commissioning**	**30 days**	**Mon 4/21/31**	**Fri 5/30/31**		
300		Commission	30 days	Mon 4/21/31	Fri 5/30/31	298	
301		**TRR West Substation**	**2100 days**	**Mon 1/9/23**	**Fri 1/24/31**		
302		**Engineering [excludes PG&E]**	**1229 days**	**Mon 1/9/23**	**Thu 9/23/27**		
303		Preliminary (30%)	235 days	Mon 1/9/23	Fri 12/1/23	158FF+30 days	304
304		Class 3 Cost Estimate	40 days	Mon 12/4/23	Fri 1/26/24	303	
305		Design (60%, 90%, 100%)	530 days	Fri 9/12/25	Thu 9/23/27	10,37FS-140 days	307FS+90 days
306		**Construction**	**500 days**	**Fri 1/28/28**	**Thu 12/27/29**		**312,313**
307		Submittals	100 days	Fri 1/28/28	Thu 6/15/28	305FS+90 days	310,309
308		**Field Construction**	**400 days**	**Fri 6/16/28**	**Thu 12/27/29**	**80,82**	
309		Earthwork/Pad Prep	150 days	Fri 6/16/28	Thu 1/11/29	307	
310		Large Equipment Procurement	150 days	Fri 6/16/28	Thu 1/11/29	307	311
311		Structures	250 days	Fri 1/12/29	Thu 12/27/29	310	
312		**Commissioning**	**120 days**	**Mon 8/12/30**	**Fri 1/24/31**	**306**	
313		Commission	120 days	Mon 8/12/30	Fri 1/24/31	306,215	298
314		**CONSTRUCTION PACKAGE #5 - DUNNIGAN PIPELINE (ALT 1)**	**1515 days**	**Mon 1/9/23**	**Fri 10/27/28**		
315		**Engineering**	**999 days**	**Mon 1/9/23**	**Thu 11/5/26**		
316		Preliminary (30%)	235 days	Mon 1/9/23	Fri 12/1/23		317
317		Class 3 Cost Estimate	100 days	Mon 12/4/23	Fri 4/19/24	316	
318		Final 60% Design	130 days	Fri 9/12/25	Thu 3/12/26	10,37FS-140 days	319
319		Final 90% Design	100 days	Fri 3/13/26	Thu 7/30/26	318	320
320		Final 100% Design	70 days	Fri 7/31/26	Thu 11/5/26	319	290,322
321		**Bid and Award**	**90 days**	**Fri 11/6/26**	**Thu 3/11/27**		
322		Bid and Award	90 days	Fri 11/6/26	Thu 3/11/27	320	324
323		**Construction**	**401 days**	**Fri 3/12/27**	**Fri 9/22/28**		
324		Submittals	60 days	Fri 3/12/27	Thu 6/3/27	322	326,328
325		**Field Construction**	**300 days**	**Mon 8/2/27**	**Fri 9/22/28**	**80,82**	
326		TCC Intake Structure	160 days	Mon 8/2/27	Fri 3/10/28	324	329,327
327		CBD Discharge Structure	140 days	Mon 3/13/28	Fri 9/22/28	326	
328		Pipeline	250 days	Mon 8/2/27	Fri 7/14/28	324	329
329		Testing	45 days	Mon 7/17/28	Fri 9/15/28	326,328	331
330		**Commissioning**	**30 days**	**Mon 9/18/28**	**Fri 10/27/28**		
331		Commission	30 days	Mon 9/18/28	Fri 10/27/28	329	
332		**CONSTRUCTION PACKAGE #6 - RED BLUFF PUMPING PLANT (BY TCCA)**	**1130 days**	**Mon 1/6/25**	**Fri 5/4/29**		
333		**Engineering**	**290 days**	**Mon 1/6/25**	**Fri 2/13/26**		
334		Preliminary (30%)	90 days	Mon 1/6/25	Fri 5/9/25		335
335		Final (60%, 90%, 100%)	200 days	Mon 5/12/25	Fri 2/13/26	334	337
336		**Bid and Award**	**90 days**	**Mon 2/16/26**	**Fri 6/19/26**		
337		Bid and Award	90 days	Mon 2/16/26	Fri 6/19/26	335	339
338		**Construction**	**720 days**	**Mon 6/22/26**	**Fri 3/23/29**		
339		Submittals	120 days	Mon 6/22/26	Fri 12/4/26	337	340
340		Pump Procurement	18 mons	Mon 12/7/26	Fri 4/21/28	339	341
341		Mechanical/Electrical	180 days	Mon 4/24/28	Fri 12/29/28	340	342
342		Testing	60 days	Mon 1/1/29	Fri 3/23/29	341	344
343		**Commissioning**	**30 days**	**Mon 3/26/29**	**Fri 5/4/29**		
344		Commission	30 days	Mon 3/26/29	Fri 5/4/29	342	
345		**CONSTRUCTION PACKAGE #7 - GCID IMPROVMENTS (BY GCID)**	**1240 days**	**Mon 1/6/25**	**Fri 10/5/29**		
346		**Engineering**	**440 days**	**Mon 1/6/25**	**Fri 9/11/26**		
347		Preliminary (30%)	120 days	Mon 1/6/25	Fri 6/20/25		348
348		Final (60%, 90%, 100%)	320 days	Mon 6/23/25	Fri 9/11/26	347	350
349		**Bid and Award**	**90 days**	**Mon 9/14/26**	**Fri 1/15/27**		



Project: Maxwell Sites Pumping
Date: Tue 1/17/23

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

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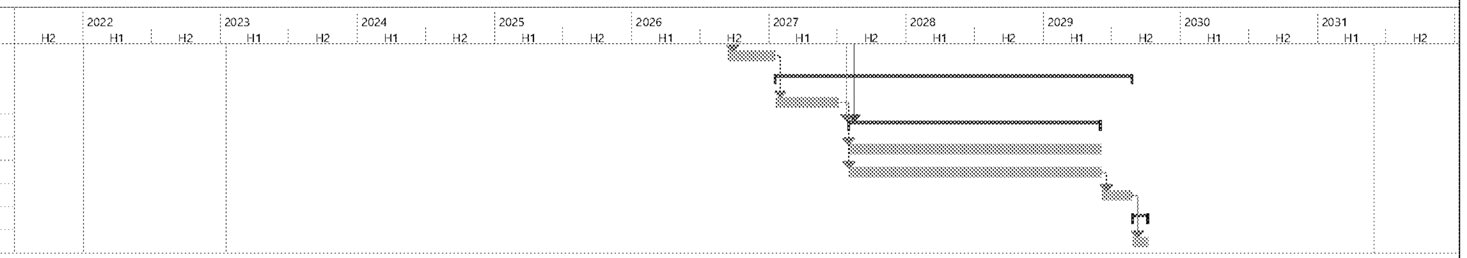
Sites Reservoir
Preliminary Construction Schedule
Maxwell - Sites Pumping and Generating (MSPG) Facilities
January 2023

ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	Successors
350		Bid and Award	90 days	Mon 9/14/26	Fri 1/15/27	348	352
351		**Construction**	**680 days**	**Mon 1/18/27**	**Fri 8/24/29**		
352		Submittals	120 days	Mon 1/18/27	Fri 7/2/27	350	354,355
353		**Field Construction**	**480 days**	**Mon 8/2/27**	**Fri 6/1/29**	**80,82**	
354		Structures	24 mons	Mon 8/2/27	Fri 6/1/29	352	
355		Earthwork	24 mons	Mon 8/2/27	Fri 6/1/29	352	356
356		Testing	60 days	Mon 6/4/29	Fri 8/24/29	355	358
357		**Commissioning**	**30 days**	**Mon 8/27/29**	**Fri 10/5/29**		
358		Commission	30 days	Mon 8/27/29	Fri 10/5/29	356	



Project: Maxwell Sites Pumping
Date: Tue 1/17/23

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

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Sites Reservoir Project

HC Design and Construction Schedule Workshop #2

January 17, 2023

Sites

Agenda

- Introduction and Objectives
- Contract Package (CP) No. 2 - Maxwell Sites Pumping Generating (MSPG) Facilities
  - Overview of Features
  - Construction Sequence
  - Design and Construction Schedule
  - Key Considerations and Assumptions
- Team Discussion
- Next Steps and Actions

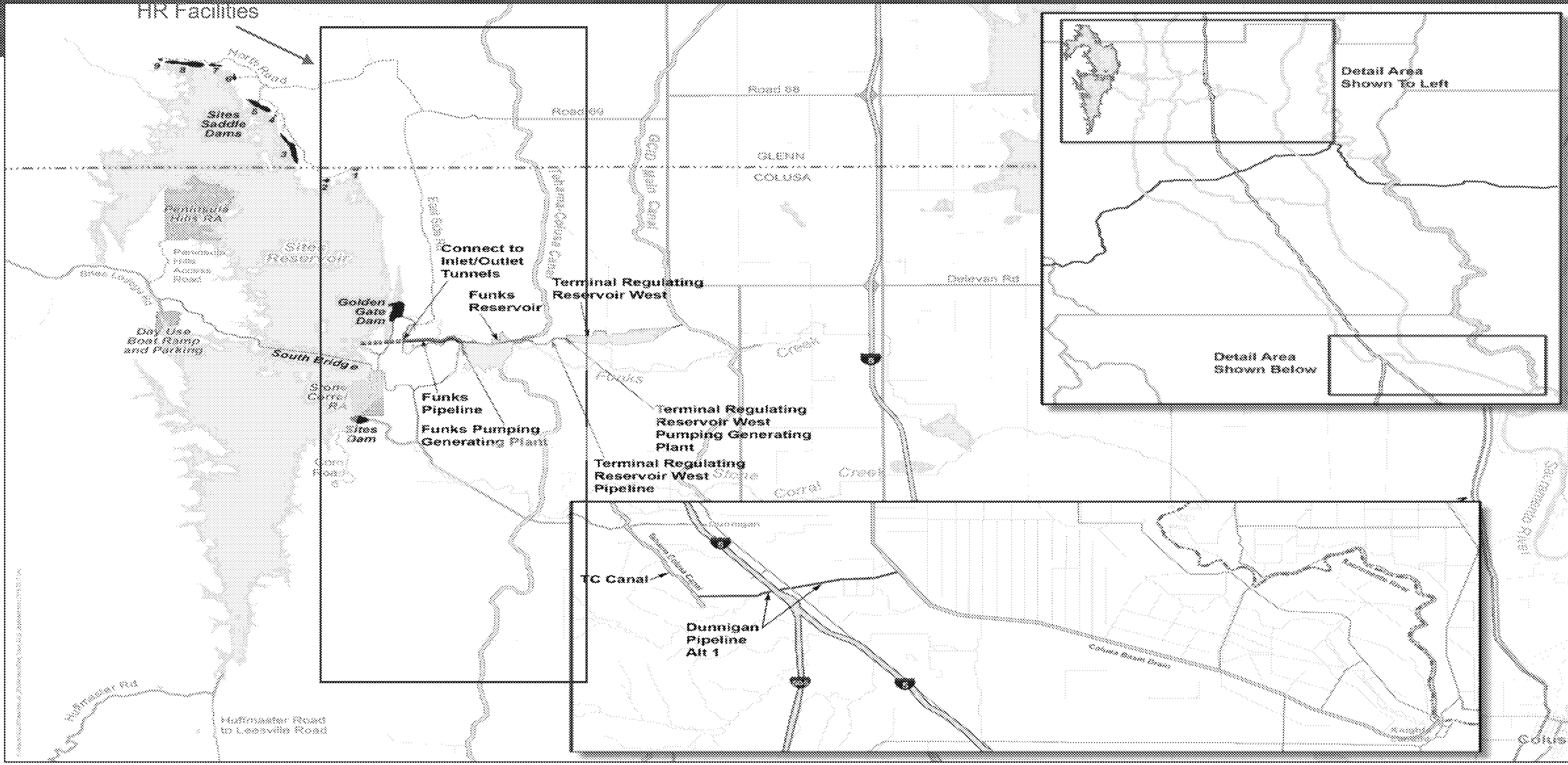
Sites

Workshop Objectives

- Show revised MSPG CP No.2 Schedule based on input from HR Schedule Workshop of December 15
- Show MSPG CP No.2 Features and Environmentally Sensitive Areas related to Parcels
- Identify key milestones in schedule that impact critical path
- Identify items that may change and would impact schedule

Overview of MSPG CP No.2 Features

MSPG CP No. 2 - Site Plan



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Funks Area – About 20 Parcels

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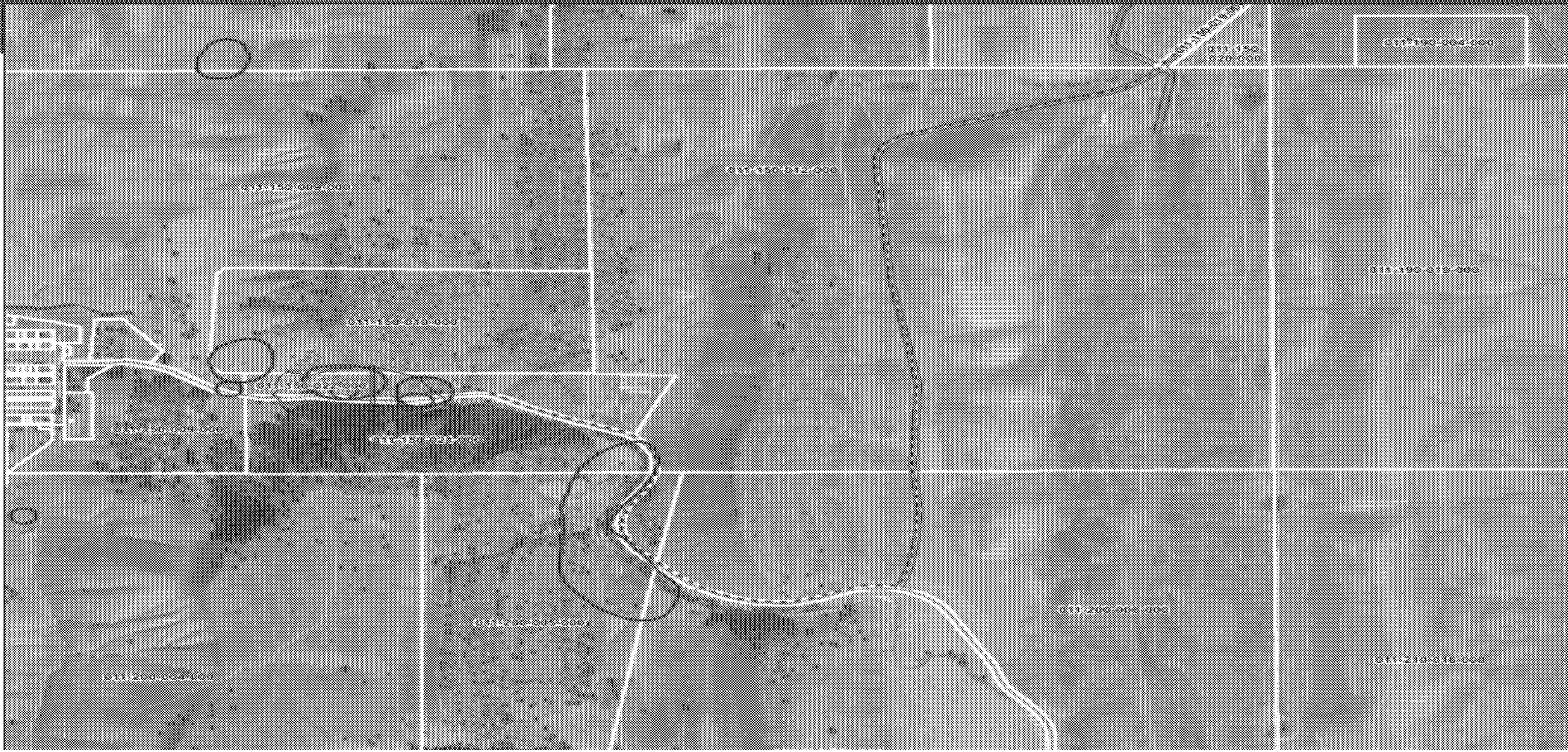
TRR West & PGP Area – About 15 Parcels

Power to Sites Dam & Access to Funks – About 8 Parcels



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MSPG CP No.2 – Feature/Parcel footprint - Take aways

- Effects about 45 Parcels – only 10% of Parcels of Sites Reservoir CP No.1
- Very few environmental sensitive areas – based on current work
- Environmental Surveys should take less time – but seasonality is critical
- Cultural Surveys should take less time

MSPG CP No.2 – Construction Sequence

- Generally:
  - Access Roads and Contractor Laydown areas
  - Inlet/Outlet Tunnel – (currently critical path item)
  - PGE Point of Interconnection – (may become critical path item)
  - Pipelines then Electrical Transmission Towers
  - Cofferdam in Funks Reservoir prior to installing Pipelines through Reservoir
  - PGP's then Switchyards
  - Excavation and haul of TRR excess material
  - Dredging and haul of Funks Reservoir material
  - Many activities in parallel as shown in revised MSPG CP No.2 Schedule

Schedule Key Assumptions/Changes

- Inlet/Outlet Facilities schedule unchanged since October version
- Added Permitting Schedule from John Spranza - December 22 version
- HC Team added Right-of-Entry and Court ordered ROE process
- Construction does not start until all permits obtained
- Schedule identifies critical path(s)
  - Through the Inlet/Outlet Facilities as part of CP No. 2
  - CAISO process, PG&E point of interconnections and providing power to PGP's
  - Funks Reservoir final sediment removal (not critical)

MSPG CP No. 2 - Schedule

Items That Would Impact Schedule

- Identify key milestones in schedule that impact critical path
  - DSOD review and Geotechnical Investigations for Inlet/Outlet Works
  - CA ISO April 15, 2023 application – if this is deemed a "Super Cluster" like 2021, then the CA ISO process is extended an additional year, which extends PG&E POI and substation and becomes Critical Path
- Identify items that may change that would impact schedule
  - Unsure of DSOD review times for design of TRR and Funks Pipelines
  - Right-of-Entry
  - Geotech investigation completion dates
  - Environmental/Permitting constraints during design
  - Environmental/Permitting constraints during construction

Next Steps and Actions

- Revise MSPG CP#2 Schedule based on this Workshop
- MSPG CP#2 Schedule to be incorporated into Baseline Schedule
- JP Present Baseline Schedule to Operations & Engineering Work Group
- JP Present to Reservoir Committee/Board

Thank You

Sites

From: Ann Newton [anewton@katzandassociates.com]
Sent: 1/18/2023 12:16:44 PM
To: Alicia Forsythe [aforsythe@sitesproject.org]
CC: Jerry Brown [jbrown@sitesproject.org]; Kevin Spesert [kspesert@sitesproject.org]; Sara M. Katz [skatz@katzandassociates.com]; Quin La Capra [qlacapra@katzandassociates.com]; Sarah Rossetto [srossetto@katzandassociates.com]
Subject: Re: Sites Storm Diversion Materials for Approval

Thanks all! We will change 3 million to 2 million across all materials and then distribute the press release and social. Holding on the blog until we receive further edits from Ali.

Sent from my iPhone

On Jan 18, 2023, at 12:09 PM, Alicia Forsythe <aforsythe@sitesproject.org> wrote:

Hi all – I think the press release and tweets are ready. I think there might be a little work on the blog. I can work on some mark-ups now.

Ali

Alicia Forsythe | Environmental Planning and Permitting Manager | Sites Project Authority | 916.880.0676 | aforsythe@sitesproject.org | www.SitesProject.org

From: Ann Newton <anewton@katzandassociates.com>
Sent: Wednesday, January 18, 2023 12:03 PM
To: Jerry Brown <jbrown@sitesproject.org>; Alicia Forsythe <aforsythe@sitesproject.org>; Kevin Spesert <kspesert@sitesproject.org>
Cc: Sara M. Katz <skatz@katzandassociates.com>; Quin La Capra <qlacapra@katzandassociates.com>; Sarah Rossetto <srossetto@katzandassociates.com>
Subject: RE: Sites Storm Diversion Materials for Approval

Thanks, Jerry. I was just working up a separate email to suggest a more conservative estimate as well. I had been thinking 4 people per household, but that's not accurate. We will say 2 million. Of course in reality, the water would also go to farms, the environment and businesses, but we just wanted to illustrate an example of how much water this could mean for California.

<image001.png>

From: Jerry Brown <jbrown@sitesproject.org>
Sent: Wednesday, January 18, 2023 11:59 AM
To: Ann Newton <anewton@katzandassociates.com>; Alicia Forsythe <aforsythe@sitesproject.org>; Kevin Spesert <kspesert@sitesproject.org>

Cc: Sara M. Katz <skatz@katzandassociates.com>; Quin La Capra <qlacapra@katzandassociates.com>; Sarah Rossetto <srossetto@katzandassociates.com>
Subject: Re: Sites Storm Diversion Materials for Approval
Importance: Low

All looks good. On the amount of water question and % of outflow:

General rules of thumb is 2 houses use 1 acre foot over the course of a year. So 382,000 AF * 2 = 764,000 homes served for one year. Also general rule of thumb is 2.5 people per home. So 764,000 homes * 2.5 people per home = 1,910,000. So say 2 million people, not 3.

Ali doing one final check on % of outflow calc with MBK.

From: Ann Newton <anewton@katzandassociates.com>
Date: Wednesday, January 18, 2023 at 11:36 AM
To: Jerry Brown <jbrown@sitesproject.org>, Alicia Forsythe <aforsythe@sitesproject.org>, Kevin Spesert <kspesert@sitesproject.org>
Cc: "Sara M. Katz" <skatz@katzandassociates.com>, Quin La Capra <qlacapra@katzandassociates.com>, Sarah Rossetto <srossetto@katzandassociates.com>
Subject: Sites Storm Diversion Materials for Approval

Jerry, Ali and Kevin,

Attached please find three documents for your final review and approval:

1. Press Release
2. Social Media Posts
3. Blog (to be signed by either Jerry or Ali, whoever is preferred)

Couple of quick notes.

4. The press release and social media reflect Ali's edits and the final Tweets she sent us this morning.
5. We would like you to confirm that you are comfortable with how we've quantified the amount of water in the headline. See comment embedded in the release.
6. Priority is social media and press release. If we need more time on the blog, we can post it later this week.

We will await your edits and then do a final QA/QC and distribute through channels only after we get approval. Thanks all!

Ann

<image002.png>

From: Sites Project [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=FE3D979238CE48168411DD8F93D5A6E6-INFO00041]
Sent: 1/18/2023 1:23:07 PM
CC: Ann Newton [anewton@katzandassociates.com]
BCC: Mariah Hugo [mhugo@katzandassociates.com]; qlacapra@katzandassociates.com; kclunews@aol.com; reception@kprl.com; jd@kusp.org; jjohnson@montereyherald.com; jtarica@thetribunenews.com; sfinucane@thetribunenews.com; cboechler@newspress.com; chris.bowman@vcstar.com; news@vcstar.com; cpeterson@bakersfield.com; psmith@bakersfield.com; jcox@bakersfield.com; johnwhitaker@midvalleypub.com; aflores@americangeneralmedia.com; cwhisnand@portervillerecorder.com; jkieta@fresnobee.com; tweber@fresnobee.com; pbowman@hanfordsentinel.com; egill@hanfordsentinel.com; jkieta@fresnobee.com; bclark@modbee.com; gstapley@modbee.com; sjlyons@gannett.com; jmward@visaliatimesdelta.com; jmoore@kvpr.org; shok@kvpr.org; susan@colusacountynews.com; kabcpress@gmail.com; info@kcaaradio.com; avishay.artsy@kcrw.com; kfinewsdirector@kfi640.com; dax.davis@alphamediausa.com; knxnews@cbsradio.com; lmantle@kpcc.org; feedback@scpr.org; pd@kpfk.org; Gene@rrbroadcasting.com; info@kvcr.org; gabriel.lerner@impremedia.com; rachbold@scng.com; hfine@labusinessjournal.com; harrison.sheppard@dailynews.com; sscauzillo@scng.com; leosmith@scng.com; kmodesti@scng.com; salrodriguez@scng.com; lwilson@scng.com; ian.james@latimes.com; john.myers@latimes.com; louis.sahagun@latimes.com; allison.wisk@latimes.com; rosanna.xia@latimes.com; tony.barboza@latimes.com; phil.willon@latimes.com; george.skelton@latimes.com; nicholas.goldberg@latimes.com; monte.morin@latimes.com; robert.greene@latimes.com; ben.muessig@latimes.com; patt.morrison@latimes.com; melody.gutierrez@latimes.com; tbray@scng.com; editor@scng.com; jhorseman@scng.com; mwisckol@scng.com; macosta@scng.com; dbharath@scng.com; salrodriguez@scng.com; clunetta@signalscv.com; ealvarenga@signalscv.com; Susan@SusanShelley.com; msprague@scng.com; julie.makinen@desertsun.com; janet.wilson@desertsun.com; thomas.coulter@desertsun.com; jdearen@ap.org; journal@awwa.org; jsondag@bloomberg.net; kpixnewsmanagers@cbs.com; readers@forbes.com; joe.rosato@nbc.com; jim.christie@thomsonreuters.com; jeffrey_goldberg@theatlantic.com; letters@time.com; jculver@usatoday.com; npenz@usatoday.com; chayes@usatoday.com; allysia.finley@wsj.com; jim.carlton@wsj.com; jim.carlton@wsj.com; magazine@wef.org; jwolfe@endeavorb2b.com; info@aztecanews.com; sraymundo@picketfencemedia.com; sara.cardine@latimes.com; carol.cormaci@latimes.com; sraymundo@picketfencemedia.com; jfuentes@scng.com; hbindy@latimes.com; clara@firebrandmediainc.com; ann@ac-la.com; weitzner@ocbj.com; brennan@ocbj.com; caviles@scng.com; jfuentes@scng.com; mwisckol@scng.com; sraymundo@picketfencemedia.com; editor@sunnews.org; agalert@cfbf.com; agalert@cfbf.com; john@capitolmr.com; csampson@capitalpress.com; nicole.nixon@capradio.org; john.howard@capitolweekly.net; mwolcott@chicoer.com; dreidel@chicoer.com; editor@bayareanewsgroup.com; jhrobinson@bayareanewsgroup.com; progers@bayareanewsgroup.com; eclendaniel@bayareanewsgroup.com; mdianda@bayareanewsgroup.com; sonate@davisenterprise.net; korendor@davisenterprise.net; champton@davidenterprise.net; aternus@davidenterprise.net; gfaison@dailyrepublic.net; thansen@dailyrepublic.net; bills@goldcountrymedia.com; Robert Summa [rsumma@appealdemocrat.com]; dwilson@appealdemocrat.com; llowe@appealdemocrat.com; kfbknews@clearchannel.com; mathers84@yahoo.com; info@winedownmedia.com; marty@kzyx.org; dwyatt@mantecabulletin.com; jcampbell@mantecabulletin.com; Robert Summa [rsumma@appealdemocrat.com]; acreasey@appealdemocrat.com; mwolcott@chicoer.com; news@orovillemr.com; silas.lyons@redding.com; damon.arthur@redding.com; jenny.espino@redding.com; carolf@goldcountrymedia.com; lkorte@sacbee.com; cnelson@sacbee.com; mbreton@sacbee.com; sacramento@bizjournals.com; bvandermeer@bizjournals.com; newsroom@sacobserver.com; dblount@recordnet.com; gbrookshire@recordnet.com; abreitler@recordnet.com; jbungart@timesheraldonline.com; kfu@thereporter.com; news@dailydemocrat.com; rdobsonn@dailydemocrat.com; asianjournal@aol.com; carlos@thestarnews.com; jordan@coastnewsgroup.com; editor@eaglenewsca.com; eic@sdnnewspapers.com; cliffalbert@clearchannel.com; rhuard@sdbj.com; bradg@sdbj.com; kendra@sdnews.com; jeff.light@sduniontribune.com; matthew.hall@sduniontribune.com; diana.mccabe@sduniontribune.com; charles.clark@sduniontribune.com; jennifer.vangrove@sduniontribune.com; joshua.smith@sduniontribune.com; deborah.brennan@sduniontribune.com; mlee@sdcwa.org; scott.lewis@voiceofsandiego.org; williamb@timesmediainc.com; echalhoub@newsvmedia.com; bruceb@latc.com; dsparrer@barareanewsgroup.com; local@bayareanewsgroup.com; mmoore@newsvmedia.com; editor@mv-voice.com; eventsandnews@dailynewsgroup.com; mangst@bayareanewsgroup.com; eclendaniel@bayareanewsgroup.com; progers@bayareanewsgroup.com; David_Houston@dailyjournal.com; info@santaclaraweekly.com; dsparrer@barareanewsgroup.com; twolverton@bizjournals.com; rfernandez@bizjournals.com; cvongsarath@community-newspapers.com; dbryant@community-newspapers.com; jeanne@timesmediainc.com; newsroom@baycitynews.com; info@bilingualweeklynews.com;

dborenstein@bayareanewsgroup.com; progers@bayareanewsgroup.com; asciacca@bayareanewsgroup.com; kalw@kalw.org; news@kalx.berkeley.edu; producers@kgoradio.com; jim.hampton@alphamediausa.com; ccabreralomeli@kqed.org; tlaurberg@KQED.org; fm@kqed.org; progers@bayareanewsgroup.com; jswartz@marinij.com; whouston@marinij.com; rhalstead@marinij.com; mary@sfbayview.com; sanfrancisco@bizjournals.com; sarah.libby@sfchronicle.com; kalexander@sfchronicle.com; matt.fleischer@sfchronicle.com; roland.li@sfchronicle.com; emilio.garcia-ruiz@sfchronicle.com; dustin.gardiner@sfchronicle.com; editor@richmondsunsetnews.com; amatthews@clintreillycommunications.com; letters@sfexaminer.com; pfimrite@sfchronicle.com; editor@scng.com; amouchard@scng.com; tsciacqua@scng.com; salrodriguez@scng.com; sgowen@scng.com; Susan@SusanShelley.com; snaishadam@ap.org; Tdelias@aol.com; julie@calmatters.org; ben@calmatters.org; dave@calmatters.org; dan@calmatters.org; scott_blair@mcgraw-hill.com; emartinson@eenews.net; maven@mavensnotebook.com; joviatt@calcities.org; journaleditor@awwa.org; lynn@majesticcontent.la; bcwaternews@brwncald.com; kedeleon@sbgtv.com; mariahjhugo@gmail.com

Subject: For Immediate Release: Recent Storms Would Have Yielded Water for Up to 2 Million People, Farms, and Businesses if Sites Reservoir Were Operational Today

Attachments: Sites Reservoir Press Release_Storm Diversion Data_1.18.2023.pdf

Good afternoon,

Please see the attached press release for Sites Reservoir, and reach out with any questions.

Sites

Note to Media: If you are interested in interviewing a representative from Sites Project Authority on this topic, please contact Ann Newton at anewton@katzandassociates.com or (310) 774-7639 to schedule an interview with the Authority's executive director, Jerry Brown.

For Immediate Release:

January 18, 2023

Contact: Ann Newton

(310) 774-7639

New Analysis Reveals Recent Storms Would Have Yielded Water for Up to 2 Million People, Farms, and Businesses if Sites Reservoir Were Operational Today

Sacramento, CA - The Sites Project Authority today announced findings from a new analysis that projected Sites Reservoir could have diverted and captured 120,000 acre-feet of water in just two weeks if the reservoir had been operational from Jan. 3 through Jan. 15. Based on forecasted flows, the analysis shows that the reservoir would continue to capture water over the next few weeks as flows continue to run high.

“This is exactly the type of scenario that Sites is being built for—short windows of extremely high flows. There is an untapped opportunity to capture and store a portion of the significant amount of flow from the Sacramento River that occurs during these rare but major storms without impacting the value of these high flows for our environment,” said Jerry Brown, Executive Director of the Sites Project Authority.

Sites Reservoir is specifically designed to divert and store water generated by storm events, like the atmospheric rivers that drenched the state in recent weeks, to increase water flexibility, reliability, and resiliency in drier years.

The analysis found Sites Reservoir could have diverted 120,000 acre-feet of water—less than 4% of Delta outflow—from Jan. 3 to Jan. 15. Long-range forecasts estimated that Sites Reservoir would continue to divert stormwater through at least Feb. 15, for a total 382,000 acre-feet of water. A single acre-foot of water is enough to exceed the average annual indoor and outdoor water use of one to two California households, according to the Water Education Foundation.

“The rainstorms that pummeled Northern California would have been Sites’ time to shine,” said Alicia Forsythe, Environmental Planning and Permitting Manager of the Sites Project Authority. “It would have captured a portion of the flood waters for use in future dry times by farms, families, and ecosystems, while leaving lots of water in the Sacramento River and Delta for our environment and fisheries.”

While Sacramento River flows started increasing in late December, the Project would have implemented its 7-day pulse flow protection criteria and not started diverting until January 3. The pulse flow protection criteria protects these initial high flow events as they provide value for outmigrating salmon and our river ecosystems.

Periods of heavy rainfall are ideal opportunities to divert and capture water that accumulates quickly but is often lost to flooding and rapid runoff. Sites will not divert any water until all other water rights and regulatory requirements are met. The analysis shows that during these major storms, all these other needs can be met, and Sites would still be able to store excess water while meeting the project’s protective diversion criteria.

Sites Reservoir is an off-stream reservoir that will capture and store a portion of stormwater from the Sacramento River and release water to California communities, farms, business, and wildlife during drier years. Sites Reservoir has broad statewide support from cities, counties, water agencies, and irrigation districts throughout the Sacramento Valley, San Joaquin Valley, Bay Area, and Southern California which are working together to advance the project. The Sites Reservoir Project is locally led by the Sites Project Authority which is made up Sacramento Valley water districts, cities, and counties.

Sites is an off-stream reservoir proposed north of the Sacramento-San Joaquin Delta, where it would provide unique water supply and environmental benefits during dry periods, especially during extended drought. Additional information can be found at sitesproject.org or on Facebook and Twitter at @SitesProject.

Exhibit H

**PROPOSITION 1 WATER STORAGE INVESTMENT PROGRAM
CONTRACT FOR ADMINISTRATION OF PUBLIC ECOSYSTEM BENEFITS
SITES RESERVOIR PROJECT**

ABBREVIATIONS AND DEFINITIONS

Unless the context otherwise requires, the terms defined in this section shall for all purposes of this Contract have the meanings hereinafter specified:

A. **Adaptive management** – shall have the same meaning as Cal. Wat. Code § 85052.

B. **Adaptive Management Plan** – identifies how monitoring will be used to adaptively manage a project's public ecosystems benefit(s) through a meet and confer process and corrective actions, when feasible.

C. **Adaptive management threshold (threshold)** – shall have the same meaning as Cal. Code Regs., tit. 23, § 6001, subd. (a)(80).

D. **Adaptive management trigger (trigger)** – shall have the same meaning as Cal. Code Regs., tit. 23, § 6001, subd. (a)(84).

E. **Annual Summary Report** – annually required report which documents the progress and status of each public environmental benefit, as described in Section 4.4.1

F. **Benefit Environmental Response** – The Ecosystem Improvement as defined in Cal. Code Regs., tit. 23, § 6001, subd. (a)(28).

G. **Benefit Implementation Actions** – actions within a project's control or fundamental to the success of a project that directly influence the quantity and/or quality of a public ecosystem benefit.

H. **Best available science** – shall have the same meaning as Cal. Code Regs., tit. 23, § 6001, subd. (a)(9).

I. **Contract** - Contract for Administration of Public Ecosystem Benefits

J. **CWC –** California Water Commission

K. **Department** – California Department of Fish and Wildlife

L. **Foundational Activities** – actions within the Project's control and fundamental for the Project to qualify under the WSIP.

M. **Funding Agreement** – California Water Commission Funding Agreement

N. **Limiting factor** - a factor which prevents the Project from achieving conditions above Adaptive Management triggers.

O. **Performance threshold** – quantity of public ecosystem benefit expected to be achieved by implementation of with-project actions compared to without-project actions, based on best available science at the time of contract execution.

P. **Project** – Sites Reservoir Project

Q. **Project Implementation Actions -** foundational actions a project must execute for derivation of public ecosystem benefits.

R. **Review Report** - Adaptive Management Plan Review Report

S. **State –** State of California

T. **WSIP** – Water Storage Investment Program

U. [INSERT ADDITIONAL DEFINITIONS HERE]

EXHIBIT B

ADAPTIVE MANAGEMENT PLAN
SITES RESERVOIR PROJECT

PROPOSITION 1 WATER STORAGE INVESTMENT PROGRAM
CONTRACT FOR ADMINISTRATION OF PUBLIC ECOSYSTEM BENEFITS
SITES RESERVOIR PROJECT

EXHIBIT B
ADAPTIVE MANAGEMENT PLAN

SECTION 1 PROGRAM-WIDE APPROACH FOR ADAPTIVE MANAGEMENT AND REPORTING

1.1 Overview and Background

Description of the operations/actions each Project Proponent will do to administer their public ecosystem benefits. This includes identification of fundamental Project commitments such as delivery volumes, exchanges, etc.; necessary components like general timing of deliveries, storage commitments; as well as identification of the benefits being contracted for (i.e., refuge water supply, pulse flow, wetland habitat….). This section will reflect commitments made in the associated Contract for the Administration of Public Ecosystem Benefits.

Refuge Water Supply Action

Sites Reservoir water will enhance ecosystems for bird populations utilizing the Pacific Flyway during annual migration periods. Up to 50,000 AF of water will be provided to assist in meeting incremental Level 4 wildlife refuge water needs north and south of the Delta. This water will improve habitat conditions for a number of species, including giant garter snake, tricolored blackbird, and migrating waterfowl.

- Surplus water acquisition
  - Storage
    - Conveyance
      - Agreements with Refuge Water Supply Program, Partners, Northern refuges
        - Increased moist soil food production (potential, TBD)

Background and Context

- Central Valley Project Improvement Act – Refuge Water Supply Program
  - CVPIA RWSP Partners
  - CVPIA Wetland Habitat Areas (Refuges)
  - CVPIA Refuge Water Supply *(include description of management and conveyance facilities)*
- Central Valley Joint Venture
  - Management, Implementation, and Monitoring Plans *(align AMP with existing monitoring)*

Yolo Bypass Flows Action

Sites Reservoir will provide two pulse flows of at least 400 cubic feet per second over a two- to three-week period into the Yolo Bypass. These pulses will be adaptively managed by the State's designated resource agencies to push water high in phytoplankton and zooplankton directly into the Cache Slough Complex, the only place in the Delta where the endangered Delta smelt population is relatively stable and/or increasing. The resulting increase in desirable food sources should improve Delta Smelt growth and populations as they mature into adults.

- Water delivery
  - Operations plan
    - Agreements with agricultural and other entities
      - Increased food supply to Delta Smelt

Background and Context

- Yolo Bypass Landscape Setting (include discussion on current [Yolo Bypass Wildlife Area] and possible future management directions [Nigiri and Conaway managed floodplain projects, Tides End, Lower Yolo, etc.] with focus on implications for Yolo Bypass Flow Action)
- North Delta Food Subsidies Study Program (*align AMP with current study program, methods, analytical approach, lessons learned*)
- Yolo Bypass Fish Monitoring Program (*align AMP with existing IEP monitoring program, which includes chlorophyll, zooplankton, and invertebrates*)

1.2 Adaptive Management Plan Approach

This Adaptive Management Plan outlines a monitoring plan, including project implementation milestones and Performance Thresholds (defined in Section 1.4) which demonstrate a project's success in providing Public Ecosystem Benefits. It identifies how monitoring will be used to adaptively manage a project's Public Ecosystem Benefits through a meet and confer process and corrective actions, when feasible. The intent of the adaptive management plan is to increase the likelihood of achieving and maintaining the desired Benefit Environmental Responses given uncertainties, which can include California hydrology, future regulatory conditions governing water operations, and climate change. Adaptive management of the project will be implemented on a five-year cycle. A five-year review cycle provides a regular opportunity to evaluate data from the previous years of project implementation, maintenance, and monitoring, and allows for incorporation of new technologies and lessons learned into subsequent implementation, monitoring, maintenance, and performance tracking.

This Adaptive Management Plan is structured according to definitions and requirements outlined in the statute and California Code of Regulations. The California Water Code Section § 85052 defines adaptive management as: "Adaptive management means a framework and flexible decision-making process for ongoing knowledge acquisition, monitoring, and evaluation leading to continuous improvement in management planning and implementation of a project to achieve specified objectives." [1]

The California Code of Regulations (-+CCR), Title 23, Waters, Water Storage Investment Program (WSIP), Section § 6014(a)(2)(A) states, "The contract between an administering agency and applicant shall contain:

(1) An adaptive management plan for the public benefits funded under the [WSIP] Program. The adaptive management plan shall contain:

   a. Public benefit monitoring metrics;

   b. Monitoring locations, frequencies, and timing;

   c. Metric evaluation methodology and associated threshold or trigger levels based on best available science that initiate adaptive management actions;

[1] Section 6001(a)(1) of the WSIP Regulations provides that the definition of "adaptive management" for WSIP "has the same meaning as provided in California Water Code section 85052."

d. Decision making process including the administering agency role and the adaptive management actions that would be taken when a trigger is reached;

e. Funding sources and financial commitments to implement the adaptive management plan; and

f. Other items deemed necessary on a case-by-case basis by administering agencies entering into the contract."

1.3 Roles and Responsibilities

Roles and responsibilities for each party are identical to those contained in Section 2 of the Contract for the Administration of Public Ecosystem Benefits.

1.3.1 Adaptive Management Expectations

The Project is obligated to deliver Project Implementation Actions and Benefit Implementation Actions identified to be within the Project's control and/or fundamental for the Project to qualify under the WSIP and included in the Contract incorporating this Adaptive Management Plan, in order to achieve expected Benefit Environmental Responses. This Adaptive Management Plan acknowledges that while the Benefit Environmental Responses (i.e., targeted ecosystem improvement outcomes) identified are derived by physical changes resulting from Project Implementation Actions and Benefit Implementation Actions, they may also be influenced by additional factors that are beyond the Project's control. However, the WSIP intends to achieve ecosystem improvement from physical changes in or resulting from Project operations, as such, failure to achieve a Benefit Environmental Response will trigger adaptive management actions, including reasonable and feasible modifications to Project Implementation Actions and/or Benefit Implementation Actions if changes to management of those actions may lead to achievement of the Benefit Environmental Responses. Descriptions of implementation actions and environmental responses are presented in **Table 1**.

Table 1. Summary WSIP Project and Benefit Implementation Actions and Environmental Response

Project	Project Implementation Actions	Benefit Implementation Actions	Benefit Environmental Response
Sites	Refuge Water Supply (north & south Delta) 1. Surplus water acquisition	Refuge Water Supply (north & south Delta) 1. Storage 2. Conveyance – agreements with Refuge Water Supply Program, Partners, Northern refuges	Refuge Water Supply (north & south Delta) 1. Increased moist soil food production (potential, TBD)
	Yolo Bypass Flows 1. Water delivery	Yolo Bypass Flows 1. Operations plan – agreements with agricultural and other entities	Yolo Bypass Flows 1. Increased food supply to Delta Smelt

Project Implementation Actions:

Defined as foundational actions a project must execute for derivation of public ecosystem benefits. Ramping of Project Implementation Actions may be established with defined project implementation milestones. However, once Performance Threshold (defined in Section 1.4) metrics are achieved, they should be maintained for the duration of *the Contract.*

Refuge Water

Surplus Water Acquisition

Yolo Bypass Water

Water Delivery from Sites Reservoir to Colusa Basin Drain and Knights Landing Ridge Cut

Benefit Implementation Actions:

Benefit Implementation Actions are defined as actions within a project's control or fundamental to the success of a project that directly influence the quantity and/or quality of a public ecosystem benefit. Ramping of Benefit Implementation Actions associated with establishing physical benefit quantities may be established as benefit implementation milestones. Agreements and/or operations necessary for benefit implementation should be immediately implemented and maintained for the life of the Contract. In cases where the Benefit Implementation Action is fundamental to achieving the benefit but may be influenced by factors outside of the project's control, the meet and confer process discussed in Section 1.5 of this Adaptive Management Plan will be used to recommend a course of action should an Adaptive Management Trigger (defined in Section 1.4) occur.

Refuge Water

Water Storage in Sites Reservoir

Conveyance Agreements with Refuge Water Supply Program, Partners, Northern refuges

Yolo Bypass Water

Operations Plan to Convey and Deliver Water from Sites Reservoir to Colusa Basin Drain and Knights Landing Ridge Cut into Yolo Bypass

Conveyance and Operations Agreements with Agricultural and Other Entities/Partners

Benefit Environmental Response:

The Ecosystem Improvement as defined in Cal. Code Regs., tit. 23, § 6001, subd. (a)(28): a public benefit that includes changing the timing of water diversions, improvement in flow conditions, temperature, or other public benefits that contribute to the restoration of aquatic ecosystems and native fish and wildlife, including those ecosystems and fish and wildlife in the Delta, per Water Code section 79753(a)(1). Ecosystems include both aquatic and terrestrial habitats and natural communities. Based on current Best Available Science, the Project Implementation and Benefit Implementation Actions are expected to result in achievement of the Benefit Environmental Response Performance Thresholds identified. Accordingly, if an Adaptive Management Trigger occurs based on a Benefit Environmental Response metric, adaptive management recommendations may call for reasonable and feasible changes to Project Implementation and/or Benefit Implementation Actions.

As part of the communication structure for implementation of this Adaptive Management Plan, a Decision-Making Body between the Project and the Department will be established to coordinate on adaptive management for all public ecosystem benefits. It is the responsibility of both the Project and the Department to identify representatives for participation in the Decision-Making Body. Other partners, resources, and expertise may be involved as needed and at the discretion of the Decision-Making Body.

Refuge Water

Increased Moist Soil Food Production

Moist Soil Area (wetted acre days)

Food Production (vegetation and invertebrates)

Yolo Bypass Water

Increased Food Supply to Delta Smelt

Habitat (flow and water quality)

Phytoplankton Production

Zooplankton Production

Conveyance and Export of Food-rich Water from Yolo Bypass to Cache Slough Complex

1.4 Adaptive Management Thresholds and Triggers

Section 6001(a) of the WSIP Regulations provides definitions for the terms "threshold" and "trigger" in the context of adaptive management. "Threshold" means a numerical value for a specific metric that is a boundary between acceptable and unacceptable situations or conditions, or a specific metric that must be exceeded for a certain reaction, result, or condition to occur. "Trigger" means an event, situation, or measurement that initiates or requires a management action. Each monitoring metric is associated with an adaptive management threshold and trigger. These are pre-determined decision points specific to each Project Implementation Action, Benefit Implementation Action, and Benefit Environmental Response. Project status for each benefit's Project Implementation Actions, Benefit Implementation Actions, and Environmental Response will be assessed as described below.

Performance Thresholds are established as the full extent of Project Implementation Actions and Benefit Implementation Actions and the quantity of Benefit Environmental Response expected to be achieved by implementation of with-project actions (Project and Benefit Implementation Actions) compared to without-project actions (baseline), based on best available science at the time of contract execution. They can be anticipated absolute values, short- or long-term averages, or rolling averages depending on the benefit described. Performance Threshold values indicate expected or better conditions above baseline conditions. Project and Benefit Implementation Actions will have Performance Thresholds associated with Contract commitments. If a ramp-up period is expected, implementation milestones may be established for Project and Benefit Implementation Actions as appropriate, that serve as interim Performance Thresholds that the Project should achieve over a specified amount of time.

Adaptive Management Triggers are events, situations, and or values determined to be below Performance Thresholds, assessed on a five-year review cycle. Adaptive Management Triggers are evaluated based on monitoring metrics associated with Project Implementation Actions, Benefit Implementation Actions, and Benefit Environmental Response and determined by the evaluation of monitoring metrics compared to the associated Performance Threshold. Adaptive Management Trigger indicates when a Public Ecosystem Benefit is experiencing a potential challenge, is not on the expected trajectory to achieve the Performance Threshold, and the monitoring data is below the Performance Threshold.

Performance Thresholds and Adaptive Management Triggers are prescribed into two phases, where each phase has its own set of thresholds and associated triggers identified (see Sections 2-4).

Phase 1 occurs during a Project's initial ramp-up period (if applicable). A ramp-up period may apply if a Project needs time to initiate and/or implement Project or Benefit Implementation Actions, such as soliciting participation, enrolling acres, developing water storage volume, etc. During Phase 1, implementation milestones are established for Project and Benefit Implementation Actions as interim Performance Thresholds to show progress during the ramp-up period towards achieving the full contractual benefit quantity. Implementation milestones will have associated Adaptive Management Triggers.

Phase 2 occurs after the ramp-up period has ended, if applicable, and/or once a Project is able to deliver the full contractual benefit quantity. During Phase 2, adaptive management will occur around the Performance Threshold and its associated trigger. If a Project does not require an initial ramp-up period for Project or Benefit Implementation Actions, then adaptive management will apply to only Phase 2.

Project Implementation Action, Benefit Implementation Action, and Benefit Environmental Response Performance Thresholds and Adaptive Management Triggers are further defined in Sections 2-4below.

1.5 Decision-Making Process

Project performance will be evaluated on its success in achieving Performance Thresholds for the Project Implementation Actions and Benefit Implementation Actions. The Performance Threshold of a Project's Benefit Ecosystem Response is considered as [*appropriate value/average*] for the physical and/or environmental monitoring metric identified. If the [*appropriate value/average*] of a physical and/or environmental metric meets the criteria of the Adaptive Management Trigger, then decision-making processes and adaptive management actions will be initiated as described below.

When a ramp-up period is required for Project Implementation Actions and Benefit Implementation Actions, Project performance will be evaluated during this ramp-up period on its success in achieving the benefit-specific implementation milestones. The purpose of implementation milestones is to show progress during the ramp-up period towards achieving Performance Thresholds.

Decision Processes:

Should an Adaptive Management Trigger occur, the Project will identify limiting factors and implement appropriate adaptive management actions. The Project may also identify reasons why Adaptive Management Actions may not result in the achievement of Performance Thresholds (e.g., extended drought conditions or infrastructure repairs) and will propose plan to meet Performance Thresholds in the next Adaptive Management Review Report period. The Project will report to the Department as identified in Section 1.6.

If, after review of the Adaptive Management Review Report and any other relevant monitoring data, the Department concludes that Project Implementation Actions and Benefit Implementation Actions are occurring and Project Implementation Action, Benefit Implementation Action, and Benefit Environmental Response metrics are above the associated Adaptive Management Triggers or the Department concludes it is not feasible to meet Performance Thresholds in the reporting period in question, the Department will confirm this status with the Project, and the Project will continue to implement its monitoring plan.

If, after review of the Adaptive Management Review Report and any other relevant monitoring data, the Department concludes that Project Implementation Action, Benefit Implementation Action, or Benefit Environmental Response metrics are at or below the associated Adaptive Management Trigger and current adaptive management actions may not be sufficient to achieve Performance Thresholds, the Department will initiate the meet and confer process. Through the meet and confer process, the Decision-Making Body will identify the limiting factor(s) to achieving conditions above the Adaptive Management Triggers.

Should the Project refuse to meet and confer, the Department will independently investigate the limiting factor(s).

Through the meet and confer process or the Department's independent investigation, the following decision processes shall be implemented:

1. If the Decision-Making Body determines that the Project Implementation Actions or Benefit Implementation Actions are not occurring as described in this Contract or a modification to adaptive management actions are warranted, the Decision-Making Body will recommend adaptive management actions and a timeline for the Project to course-correct.
    a. If the Project successfully implements the recommended adaptive management actions, then the monitoring plan will continue with increased annual evaluation of metrics compared to Performance Thresholds and Adaptive Management Triggers. After a subsequent five-year review cycle of annual metric assessment showing achievement of Performance Thresholds, the Project can resume monitoring with a five-year adaptive management review.
    b. If the Decision Making Body cannot agree on limiting factors or recommended actions to achieve levels above adaptive management triggers, the Department may initiate the Public Benefit Dispute Process. See Contract for Administration of Public Ecosystem Benefits (CAPB) Section 5.
    c. If the Project does not implement the recommended actions according to the recommended timeline or fails to achieve levels above adaptive management triggers as a result of failure to implement Project Implementation Actions or Benefit Implementation Actions, the Department may initiate the Public Benefit Dispute Process. See CAPB Section 5.
2. If a Benefit Environmental Response Adaptive Management Trigger occurs, the Decision-Making Body will determine the limiting factors and may recommend adaptive management actions for reasonable and feasible changes to Project Implementation Actions and/or Benefit Implementation Actions if changes to those actions may lead to achievement of the Benefit Environmental Responses.
    a. If recommended adaptive management actions are implemented by the Project, monitoring will continue with annual evaluation of metrics until the succeeding five-year review.
        i. If Performance Thresholds are achieved at the succeeding five-year adaptive management review, no further action needs to be taken and the Project can resume the regular schedule of monitoring with five-year adaptive management review.
        ii. Should the Benefit Environmental Response Adaptive Management Trigger occur after ten succeeding years (two five-year review cycles), the Decision-Making Body will meet and confer and determine if an adjustment to the Adaptive Management Plan for the benefit in question, or to the ecosystem benefit Performance Threshold is needed, or an alternative ecosystem benefit can be achieved. Accordingly, the Department will process an amendment and inform the CWC of any benefit changes. See CAPB Section 7.6.
    b. Should the Project choose not to implement adaptive management actions, the Department may initiate the Public Benefit Dispute Process. See CAPB Section 5.
    c. Should the Decision-Making Body not agree on an adjustment to the Adaptive Management Plan, or to the ecosystem benefit Performance Threshold, or to an alternative ecosystem benefit, the Department may initiate the Public Benefit Dispute Process. See CAPB Section 5.

1.6 Program Reporting

Pursuant WSIP Regulations sections 6014(a)(2)(A)(3), the Project will provide to the Department an Annual Summary Report that includes:

- Summary of Project Implementation Actions and Benefit Implementation Actions
- Discussion of challenges and/or success in achieving Project Implementation Actions and Benefit Implementation Actions
- Summary of monitoring methods

- All monitoring data
- Discussion of management activities
- Other relevant information

The Project will provide to the Department an Adaptive Management Review Report each five years or annually should an Adaptive Management Trigger occur. The Adaptive Management Review Report shall include:

- Items listed above for the Annual Summary Report
- Description of data evaluation methodology
- Results of metric analyses
- Evaluation of all Performance Thresholds
- Evaluation of Benefit Environmental Response
- Discussion of any Adaptive Management Triggers that occurred, limiting factors that may have contributed to Adaptive Management Triggers occurring, and Adaptive Management actions taken to meet Performance Thresholds
- Discussion of challenges and/or success in achieving Public Ecosystem Benefit(s) and Performance Thresholds

Reports will be provided to the Department through electronic and/or hard copy transmittal as agreed upon and depending on data type.

1.7 Funding Adaptive Management Plan Implementation

Pursuant the WSIP Regulations Section 6014(a)(2)(A)(1)(e), this Adaptive Management Plan contains public ecosystem benefit monitoring metrics, monitoring locations, frequencies, and timing, metric evaluation methodology and associated thresholds and trigger levels based on best available science that initiate adaptive management actions, decision making processes, funding sources and financial commitments to implement this Adaptive Management Plan, and any other items deemed necessary. The Project may elect to participate in collaborative partnerships regarding the implementation of monitoring and/ or adaptive management actions of ecosystem benefits. However, should existing monitoring undertaken through collaborative partnerships cease, it is the Project's responsibility to implement necessary monitoring for this Adaptive Management Plan.

SECTION 2 ADAPTIVE MANAGEMENT OF PROJECT IMPLEMENTATION ACTIVITIES

2.1 PROJECT IMPLEMENTATION ACTION (e.g., water delivery, storage, acquisition)

Overview of the Project and Project Specific Implementation Actions (see Table 1) necessary to generate public ecosystem benefit.

Project implementation actions are foundational actions a project must execute for derivation of public ecosystem benefits.

Refuge Water Supply

Surplus Water Acquisition

Yolo Bypass Flows

Water Delivery from Sites Reservoir to Colusa Basin Drain and Knights Landing Ridge Cut

2.1.1 Monitoring Metrics and Performance Thresholds

The Department anticipates monitoring metrics associated with Performance Thresholds for each Project Implementation Action identified.

2.1.1.1 Metric:

Description of unit(s) of measure and other characteristics associated with Project Implementation Actions for performance tracking over time.

Refuge Water Supply

Surplus Water Acquisition (timing and volume)

Performance Threshold:

- *Implementation milestones*
  - *dates, timeline*
- *Performance Threshold*
  - *surplus water acquisition – documentation of volume acquired*

Yolo Bypass Flows

Water Delivery from Sites Reservoir to Colusa Basin Drain and Knights Landing Ridge Cut (flow, schedule, volume)

Performance Threshold:

- *Implementation milestones*
  - *dates, timeline*
- *Performance Threshold*
  - *water delivery – documentation of durations and flow rates, volumes*

2.1.2 Monitoring Methodology

Commented [SJ1]: need

Refuge Water Supply

Description of methodology

- *Location documentation*
- *Timing and frequency documentation*

Yolo Bypass Flows

Description of methodology

- *Location documentation*
- *Timing and frequency documentation*

2.1.3 Adaptive Management Triggers

Commented [SJ2]: need

The Department anticipates Adaptive Management Triggers for each Project Implementation Action identified.

Refuge Water Supply

Adaptive Management Triggers:

- *Trigger for Implementation milestones, if applicable – documentation*
- *Trigger for Performance Threshold – documentation*

Yolo Bypass Flows

Adaptive Management Triggers:

- *Trigger for Implementation milestones, if applicable – documentation*
- *Trigger for Performance Threshold – documentation*

2.1.4 Management Actions

Commented [SJ3]: need

Potential adaptive management options specific to Project Implementation Actions.

Refuge Water Supply

Adaptive Management Options:

Management and administrative remedies

Yolo Bypass Flows

Adaptive Management Options:

Management and administrative remedies

SECTION 3 ADAPTIVE MANAGEMENT OF BENEFIT IMPLEMENTATION ACTIVITIES

Commented [SJ4]: Need

3.1 PUBLIC ECOSYSTEM BENEFIT

3.1.1 Benefit Objective

Benefit descriptions with objectives of Project Actions relative to achieving public ecosystem benefit/ environmental response are provided below.

Refuge Water Supply

Sites Reservoir water will enhance ecosystems for bird populations utilizing the Pacific Flyway during annual migration periods. Up to 50,000 AF of water will be provided to assist in meeting incremental Level 4 wildlife refuge water needs north and south of the Delta. This water will improve habitat conditions for a number of species, including giant garter snake, tricolored blackbird, and migrating waterfowl.

Yolo Bypass Flows

Sites Reservoir will provide two pulse flows of at least 400 cubic feet per second over a two- to three-week period into the Yolo Bypass. These pulses will be adaptively managed by the State's designated resource agencies to push water high in phytoplankton and zooplankton directly into the Cache Slough Complex, the only place in the Delta where the endangered Delta smelt population is relatively stable and/or increasing. The resulting increase in desirable food sources should improve Delta Smelt growth and populations as they mature into adults.

3.1.2 Monitoring Metrics and Performance Thresholds

Commented [SJ5]: Need

3.1.2.1 Metrics:

Description of metrics associated with Benefit Implementation Actions (Table 1). These are specific physical activities the Project is able and willing to do, necessary for the administration of public ecosystem benefits. For example, obtaining and maintaining necessary agreements for the exchange and/or delivery of a specified long-term or predetermined volume of water, or enrollment/maintenance of a specific number of habitat acres into a Project.

Refuge Water Supply

Water Storage in Sites Reservoir

Performance Thresholds:

- *Implementation Milestones – timelines, schedule*
- *Performance Thresholds*
  - *Water storage of quantities acquired*
  - *Contractual quantities acquired*

Conveyance Agreements with Refuge Water Supply Program, Partners, Northern Refuges

Performance Thresholds:

- *Implementation Milestones – timelines, schedule*
- *Performance Thresholds*
  - *Operations plan completion*
  - *Conveyance and operations agreements with Refuge Water Supply Program, Partners, Northern refuges completion*

Yolo Bypass Flows

Operations Plan to Convey and Deliver Water from Sites Reservoir to Colusa Basin Drain and Knights Landing Ridge Cut into Yolo Bypass

Performance Thresholds:

- *Implementation Milestones*
- *Performance Thresholds*
  - *Operations plan*

<u>Conveyance and Operations Agreements with Agricultural and Other Entities/Partners</u>

RD 108 (Wallace Wier)

Knaggs Ranch

Conaway Ranch

Performance Thresholds:

- *Implementation Milestones – documentation*
- *Performance Thresholds*
  - *Operations plans completion – documentation*
  - *Conveyance and operations agreements – documentation*

3.1.3 Monitoring Methodology

Commented [SJ6]: need

Refuge Water Supply

Description of methodology

- *Documentation*

Yolo Bypass Flows

Description of methodology

- *Documentation*

3.1.4 Adaptive Management Triggers

Refuge Water Supply

Adaptive Management Triggers:

- *Trigger for Implementation milestones –schedule*
- *Trigger for Performance Threshold – water acquired, agreements completed*

Yolo Bypass Flows

Adaptive Management Triggers:

- *Trigger for Implementation milestones - schedule*
- *Trigger for Performance Threshold – operations plan completion, agreements completed*

3.1.5 Management Actions

Potential adaptive management options specific to Benefit Implementation Actions

Refuge Water Supply

Adaptive Management Options:

Management and administrative remedies

Yolo Bypass Flows

Adaptive Management Options:

Management and administrative remedies

SECTION 4 ADAPTIVE MANAGEMENT OF BENEFIT ENVIRONMENTAL RESPONSES

4.1 PUBLIC ECOSYSTEM BENEFIT

4.1.1 Environmental Response

Benefit description of biological outcome anticipated as a result of the Project i.e., the environmental responses expected by the Project.

Refuge Water Supply

Sites Reservoir water will enhance ecosystems for bird populations utilizing the Pacific Flyway during annual migration periods. Up to 50,000 AF of water will be provided to assist in meeting incremental Level 4 wildlife refuge water needs north and south of the Delta. This water will improve habitat conditions for a number of species, including giant garter snake, tricolored blackbird, and migrating waterfowl.

Yolo Bypass Flows

Sites Reservoir will provide two pulse flows of at least 400 cubic feet per second over a two- to three-week period into the Yolo Bypass. These pulses will be adaptively managed by the State's designated resource agencies to push water high in phytoplankton and zooplankton directly into the Cache Slough Complex, the only place in the Delta where the endangered Delta smelt population is relatively stable and/or increasing. The resulting increase in desirable food sources should improve Delta Smelt growth and populations as they mature into adults.

4.1.2 Monitoring Metrics and Performance Thresholds

4.1.2.1 Metrics:

Description of metrics associated with determining Benefit Environmental Response, i.e., how the Project will demonstrate that it provides Benefit Ecosystem Response. In most cases, this will be a general biological response metric, for example, a long-term average habitat functionality score, evidence of fish response, or long-term targeted bird use values.

Refuge Water Supply

Performance Threshold:

- Increased moist soil food production (potential, TBD)
  - Water volume delivered
  - Wetted-acre days
  - Vegetation response (potential)
  - Invertebrate response (potential)

Yolo Bypass Flows

Performance Threshold:

- Increased food supply to Delta Smelt
  - Habitat
    - Flow (rate and residence time, stage)
    - Continuous water quality (temperature, dissolved oxygen [DO], pH, specific conductance, turbidity, total chlorophyll, fluorescence, and fluorescent dissolved organic matter as a proxy for dissolved organic carbon)
    - Discrete water quality (nutrients and chlorophyll a)
    - Pesticides
  - Lower trophic level response
    - Zooplankton production
    - Invertebrate production
  - Microcytis production (adverse)
  - Salmonid straying (adverse)

4.1.3 Monitoring Methodology

Refuge Water Supply

Description of methodology

- *Location*
  - *Multiple, based on Refuge agreements*
- *Timing and frequency*
  - *Multiple, based on Refuge agreements*
- *Wetted-acres days*
  - *Calculated based on water volume delivered*
- Vegetation response (potential)
  - *Adapted from Refuge or CVJV methods*
- Invertebrate response (potential)
  - *Adapted from Refuge or CVJV methods*

Yolo Bypass Flow

Description of methodology

- *Location*
  - *Multiple, (adapted from North Delta Food Subsidies Study Program and IEP Yolo Bypass Fish Monitoring Program augmented by Sites Authority)*

- *Timing and frequency*
  - *Adapted from North Delta Food Subsidies Study Program*
- Habitat
  - *Adapted from North Delta Food Subsidies Study Program and IEP Yolo Bypass Fish Monitoring Program*
- Lower trophic level response
  - Zooplankton production
  - Invertebrate production
    - *Adapted from North Delta Food Subsidies Study Program and IEP Yolo Bypass Fish Monitoring Program*
- Microcytis production (adverse)
  - *Adapted from North Delta Food Subsidies Study Program and IEP Yolo Bypass Fish Monitoring Program*
- Salmonid straying (adverse)
  - *Adapted from North Delta Food Subsidies Study Program and IEP Yolo Bypass Fish Monitoring Program*

4.1.4 Adaptive Management Triggers

Refuge Water Supply

Adaptive Management Triggers:

- *Trigger related to achieving the Performance Threshold*
  - *Wetted-acre days trigger TBD based on volume conversion and Refuge characteristics*
  - *Additional triggers could be considered (veg and invert response); however, based on refuge management beyond water supply deliveries*

Yolo Bypass Flows

Adaptive Management Triggers:

- *Trigger related to achieving the Performance Threshold*
  - *Trigger(s) to be developed based on North Delta Food Subsidies Study Program (demonstration of expected benefit)*

4.1.5 Management Actions

Discussion of potential factors that could influence the achievement of environmental response and identification of the meet and confer process specific to each benefit, as appropriate.

Refuge Water Supply

Water conveyance facilities upgrades

Various management activities at Refuges (we will describe a range of activities that refuges already employ; derived from individual refuge management plans)

Yolo Bypass Flows

Flow timing, rate, duration refinements

Flow management within the Bypass in cooperation with agricultural partners (berms, etc.)

SECTION 5 REFERENCES

Stone Corral Creek and Funks Creek Aquatic Study Plan

January 18, 2023

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Contents

Tables

Figures

Acronyms and Abbreviations

°F	degrees Fahrenheit
ADCP	acoustic Doppler current profiler
AFDM	ash-free dry mass
Aquatic Study Plan	Stone Corral Creek and Funks Creeks Aquatic Study Plan
ASCI	Algae Stream Condition Index
Authority	Sites Project Authority
cfs	cubic feet per second
CDFW	California Department of Fish and Wildlife
CFGC	California Fish and Game Code
Chico ABL	Chico Aquatic Bioassessment Laboratory
CPUE	catch per unit effort
CSCI	California Stream Condition Index
CVRWQCB	Central Valley Regional Water Quality Control Board
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
GCID	Glenn-Colusa Irrigation District
GIS	geographic information system
GPS	global positioning system
LiDAR	light detection and ranging
MPSL-MLML	Marine Pollution Studies Laboratory at Moss Landing Marine Laboratories
PHAB	physical habitat
Project	Sites Reservoir Project
QA/QC	quality assurance/quality control
SQL	Structured Query Language
SWAMP	Surface Water Ambient Monitoring Program
SWRCB	State Water Resources Control Board
TAF	thousand acre-feet
TC Canal	Tehama-Colusa Canal
TCCA	Tehama-Colusa Canal Authority
USGS	U.S. Geological Survey

1.0 Introduction and Purpose

1.1 Introduction

This Stone Corral Creek and Funks Creek Aquatic Study Plan (Aquatic Study Plan) has been prepared for the Sites Project Authority (Authority) to guide fisheries technical studies to be conducted prior to and during operation of the Sites Reservoir Project (Project), as well as ongoing monitoring during Project operations, if necessary. The Project is a proposed offstream storage project located on the west side of the Sacramento Valley in Glenn and Colusa Counties, approximately 10 miles west of the community of Maxwell. It is designed to store unappropriated water from winter and spring storm events in the northern Sacramento River watershed. The Project would impound 1.5 million acre-feet of water in a reservoir. The reservoir would be created by building Sites Dam on Stone Corral Creek, Golden Gate Dam on Funks Creek, and a series of saddle dams on the northeastern rims of Antelope Valley. While a portion of naturally occurring seasonal flows in Stone Corral Creek and Funks Creek would be retained in the reservoir, the primary source of water for the reservoir would be diversions from the Sacramento River. These diversions would be up to 4,200 cubic feet per second (cfs) via two existing facilities: the Red Bluff fish screen and pumping plant (operated by the Tehama-Colusa Canal Authority [TCCA]) and the Glenn-Colusa Irrigation District's (GCID) fish screen and pumping plant near Hamilton City.

1.2 Purpose of Aquatic Study Plan

As part of the Project alternatives development, the Authority has committed in the Project's Revised Draft Environmental Impact Report/Supplemental Draft Environmental Impact Statement (RDEIR/SDEIS), as well as in the Project's application to appropriate water, to prepare this Aquatic Study Plan and conduct technical studies on Stone Corral Creek and Funks Creek in the reaches of interest (i.e., the stream reaches below the dams) as well as the downstream reaches.[2] The Authority is proposing the following special water right term to be included in its water right permit.

Within 1 year of issuance of this permit and prior to impoundments to storage of flows from Stone Corral Creek and Funks Creek under this permit, Permittee shall finalize this draft Aquatic Studies Plan in accordance with Section 2.5.2.1. and Appendix D, Section 2D.4 of the Project's RDEIR/SDEIS to guide studies in Stone Corral Creek and Funks Creek that shall be implemented prior to and during construction activities to collect information necessary to address California Fish and Game Code Section (CFGC) 5937. This Aquatic Studies Plan includes an assessment of fish assemblage and available habitat, flow characteristics, water temperatures, bioassessment monitoring, and method for reporting data. This Aquatic Studies Plan shall be finalized in consultation with the California Department of Fish and Wildlife (CDFW), the U.S. Fish and Wildlife Service (USFWS), and Colusa County. Permittee shall implement the Technical Studies Plan.

Using the results of the technical studies, within 5 years of issuance of this permit and prior to impoundments to storage of flows from Stone Corral Creek and Funks Creek under this permit, the Permittee shall develop a Stone Corral Creek and Funks Creek Operations Plan (Operations Plan) in

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[1] See Section 2.5.2.1. and Appendix D, Section 2D.4 of the RDEIR/SDEIS.

accordance with Section 2.5.2.1. and Appendix D, Section 2D.4 of the RDEIR/SDEIS. The Authority is proposing the following special water right term to be included in its water right permit.

The Operations Plan shall describe Permittee's approach to address CFGC Section 5937 requirements, if any, resulting from impoundments to storage of flows from those creeks under this permit, while also ensuring that the Project's flood protection benefits are realized. The Operations Plan shall include, but may not be limited to, the approach for reservoir releases into Stone Corral Creek and Funks Creek, including release schedules and volumes and a monitoring plan. The Operations Plan shall be developed in consultation with CDFW, USFWS, and Colusa County, and approved by the Deputy Director for Water Rights.

Together, these studies would document the two creeks' existing hydrology, assess flow levels needed to maintain fluvial geomorphic processes, and update information on aquatic species presence and habitat use in the reaches downstream of the dams to establish aquatic baseline information that would be used to determine and subsequently manage environmental releases from the Project into the creeks. As part of the Aquatic Study Plan, studies would be initiated once access permission to the creeks through private property is obtained. The studies would also be used to inform final design for the proposed Sites Dam and Golden Gate Dam release facilities and operational requirements. The Aquatic Study Plan includes fish monitoring, a Surface Water Ambient Monitoring Program (SWAMP) bioassessment study, a hydrogeomorphic study, and a temperature study. Specific details for the field studies would be designed and conducted in collaboration with CDFW, USFWS and Colusa County.

The objectives of these studies are as follows.

- Determine existing fish assemblages in these creeks, including locations of fish species presence and habitat use.
- Characterize currently available habitats (e.g., spawning, rearing, foraging, and sheltering habitats) at varying flow levels, including the presence or absence of pools that persist through summer.
- Characterize flows, including assessing the baseflow during summer and conducting a fluvial geomorphologic study to characterize habitat conditions, substrate compositions, and flow levels.
- Conduct a SWAMP technical study (i.e., a stream bioassessment) that focuses on relationships between physical habitat (PHAB), water quality, and benthic macroinvertebrates.
- Implement hydrological studies to define flow temperature relationships.

This Aquatic Study Plan summarizes the methods and reporting strategies for the reaches downstream of the proposed impoundments on Stone Corral Creek and Funks Creek. Using information obtained from these field studies, along with currently available information, the Authority would develop a schedule of releases for Stone Corral Creek and Funks Creek to be incorporated into the Operations Plan. Flow releases into these creeks would be made to maintain flood control benefits of the Project and would not overtop streambanks or flood downstream areas. The release schedule would also account for meeting demands of senior water right holders on Stone Corral Creek and Funks Creek consistent with the timing of the existing water right that are downstream from the proposed dams. Appendix 2D, *Best Management Practices, Management Plans, and Technical Studies* of the *Sites Reservoir Project Revised Draft Environmental Impact Report/Supplemental Draft Environmental Impact Statement* (Sites Project Authority and Bureau of Reclamation 2021) describes the purpose, objectives, content, and timing of the field studies identified above.

Furthermore, if flows in Stone Corral Creek and Funks Creek are needed to maintain fish in good condition in compliance with CFGC Section 5937, then the Authority would adapt this study program into an operations monitoring program with a duration of 5 to 10 years to document and adaptively manage the timing and magnitude of flow releases to maintain fish in good condition below the dams along with the habitats upon which they depend. Performance standards would be developed in conjunction with the Authority and the relevant agencies (CDFW, USFWS, and Colusa County) prior to the start of operations monitoring.

1.2.1 Integration of Fish Monitoring with Aquatic Habitat Survey Methods

Aquatic habitat survey methods for sampling are described below. Note that the field observations and results from other studies (i.e., the stream bioassessment study and hydrogeomorphic study) would aid in the assessment of aquatic habitat and are referenced where applicable.

An initial reconnaissance survey would provide information on existing habitat and inform the selection of sampling stations within the Stone Corral Creek and Funks Creek drainages. Stations would initially be set at fixed distances apart to accommodate between 10 and 15 sampling stations within each drainage. Stations would be mapped prior to going into the field and then field-verified during the reconnaissance survey. Some leeway would be given to adjust locations to prioritize reaches containing optimal fish habitat and final locations would be discussed with CDFW and Colusa County to ensure appropriate placement. Stations that fell within dry or sub-optimal aquatic habitat for fish survival would be de-prioritized or curtailed.

As part of the pre-operation sampling for fish community and aquatic habitat, the following data would be collected and/or integrated into the fish study.

- **Fish community.** Surveys would characterize local fish communities using methods described below. As feasible and appropriate, methods would be consistent with those used in previous and ongoing fish community survey efforts (e.g., methods accepted as standard practice for sampling aquatic systems; Meador et al. 1993). (Fish Study)
- **Substrate composition.** Surveys would document stream bed substrate particle size using Wolman pebble counts (Wolman 1954; Kondolf and Li 1992), gravelometer, substrate facies mapping, or similar methods. (Hydrogeomorphic Study)
- **Riparian vegetation cover.** Surveys would measure the relative amount (e.g., percent cover) of riparian vegetation cover over aquatic habitat to document conditions. Riparian vegetation cover would be monitored using the California Rapid Assessment Method (Brown 2013), or similar method. (Hydrogeomorphic Study)
- **Benthic macroinvertebrate presence.** To better understand the entire aquatic community currently present in these creeks, a SWAMP bioassessment that focuses on the relationships between PHAB, water quality, benthic macroinvertebrates, and algal communities would be conducted on the reaches downstream of the proposed impoundments on Stone Corral Creek and Funks Creek. The bioassessment study would be conducted using the methods described in the SWRCB's SWAMP protocols (Ode et al. 2016a, 2016b). (SWAMP Bioassessment Study)
- **Water quality.** Monitoring for general water quality parameters (e.g., temperature, turbidity, pH, conductivity, salinity, and dissolved oxygen would be conducted to assess surface water quality. Water quality monitoring would be conducted using methods described in the State Water Board's SWAMP protocols (Ode et al. 2016a, 2016b). (SWAMP Bioassessment Study and Fish Study)
- **Water temperature.** Water temperature profiles for Stone Corral Creek and Funks Creek would be developed. These water temperature profiles would be used to inform decisions about which tiers

of the inlet/outlet (I/O) tower to use when conducting releases into Funks Creek and intake levels for the release to Stone Corral Creek. The goal would be to mimic existing temperature profiles in Funks Creek.

1.3 Applicable Methods for Determining Operational Streamflows

After baseline hydrogeomorphic conditions are obtained and evaluated in context with the studies from other disciplines (i.e., Fish Assemblage Study and SWAMP Bioassessment Study), various approaches for estimation of minimum streamflows to maintain ecosystem and geomorphic function would be reviewed, such as "the functional flow" approach suggested by Yarnell et al. (2015), the Instream Flow Incremental Methodology (National Biological Service, U.S. Department of the Interior 1995), the CDFW Instream Flow Program,[3] the California Environmental Flows Framework,[4] and the Richter et al. (2011) approach. These methods would be investigated for their applicability to determine appropriate streamflows on Stone Corral Creek and Funks Creek to maintain fish in good condition. Coordination with CDFW, USFWS, and Colusa County would be required before a method is selected.

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[3] https://wildlife.ca.gov/Conservation/Watersheds/Instream-Flow

[4] https://ceff.ucdavis.edu/

2.0 Environmental Setting

2.1 Environmental Setting of Stone Corral Creek and Funks Creek

Stone Corral Creek and Funks Creek are both small watersheds originating below the snowline on the eastern foothills of the California Coast Range at elevations of 700 to 850 feet. Consequently, they do not receive cold snowmelt water. Rather, they respond rapidly to significant rainfall events and flow intermittently, mostly during winter and early spring. From their origins, they flow through low foothills, across Antelope Valley (the proposed location of Sites Reservoir), through a series of shallow canyons and eventually spill onto the Sacramento Valley floor (Figure 1). For much of their course on the valley floor, they are confined to narrow channels between berms along the edge of agricultural fields and road prisms. While the stream channels of these creeks are not actively managed, their straight alignment and angular turns around agricultural fields and along roads indicate that they were modified from their natural historic channels. In the upper parts of the watersheds just above the dam locations, these streams are largely devoid of riparian cover resulting from livestock use (Bureau of Reclamation and California Department of Water Resources 2008:3-20). In the lower reaches where the streams run through and around agricultural fields, shaded riparian habitat is sparse and consists mostly of low shrubs, grasses, occasional oaks[5] (*Quercus* sp.), willows (*Salix* sp.), and cottonwood (*Populus* sp.) trees.

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[5] According to Colusa County, there are no oaks east of Mills Orchard Rd. east of Stone Corral Creek nor approximately east of Funks Reservoir.

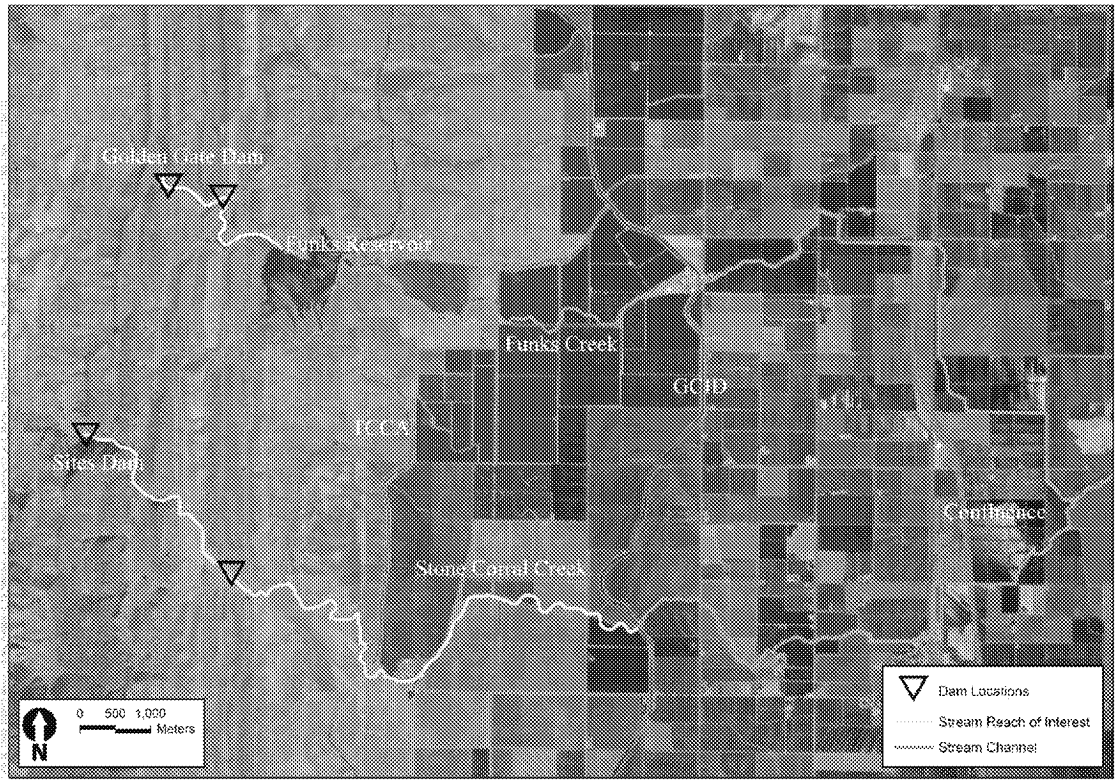

Figure 1. Stone Corral Creek and Funks Creek Reaches of Interest and Downstream Reaches.

2.1.1 Stone Corral Creek

Stone Corral Creek has a drainage area of 38 square miles upstream of the proposed Sites Dam. From the proposed location of the Sites Dam, Stone Corral Creek meanders through a shallow canyon onto the valley floor, where it flows through an incised channel across grazing lands. At 4.6 miles from the Sites Dam location, Stone Corral Creek crosses over a siphon in the Tehama-Colusa Canal (TC Canal) and begins to travel through agricultural lands. About 3 miles below the TC Canal siphon, Stone Corral Creek crosses the GCID Main Canal. Although most of the water in the canal passes under Stone Corral Creek in a siphon, GCID releases water from the canal into Stone Corral Creek for delivery to agricultural fields downstream. About 5.5 miles below the GCID Main Canal, Funks Creek flows into Stone Corral Creek, and then Stone Corral Creek flows an additional 5 miles to the Colusa Basin Drain. Refer to Figure 2 for a figure showing these various elements.

The U.S. Geological Survey (USGS) collected 27 years of discharge measurements at USGS Gage No. 11390672, in Stone Corral Creek near the community of Sites, California, from 1958 through 1985 (Figure 3). The data demonstrate a high variability of flow over the period of record, and there were 3 years of zero flow: 1972, 1976, and 1977 (Figure 4). Yates (1989) estimated the recurrence interval of a winter without flow at 12 to 14 years. The maximum annual discharge during the period of record was

39.9 thousand acre-feet (TAF) in 1983. Based on the USGS period of record, mean annual daily discharge for the period of record was calculated as 9.02 cfs (SD of 67.5, median is 0) and annual average discharge was 6.5 TAF per year.

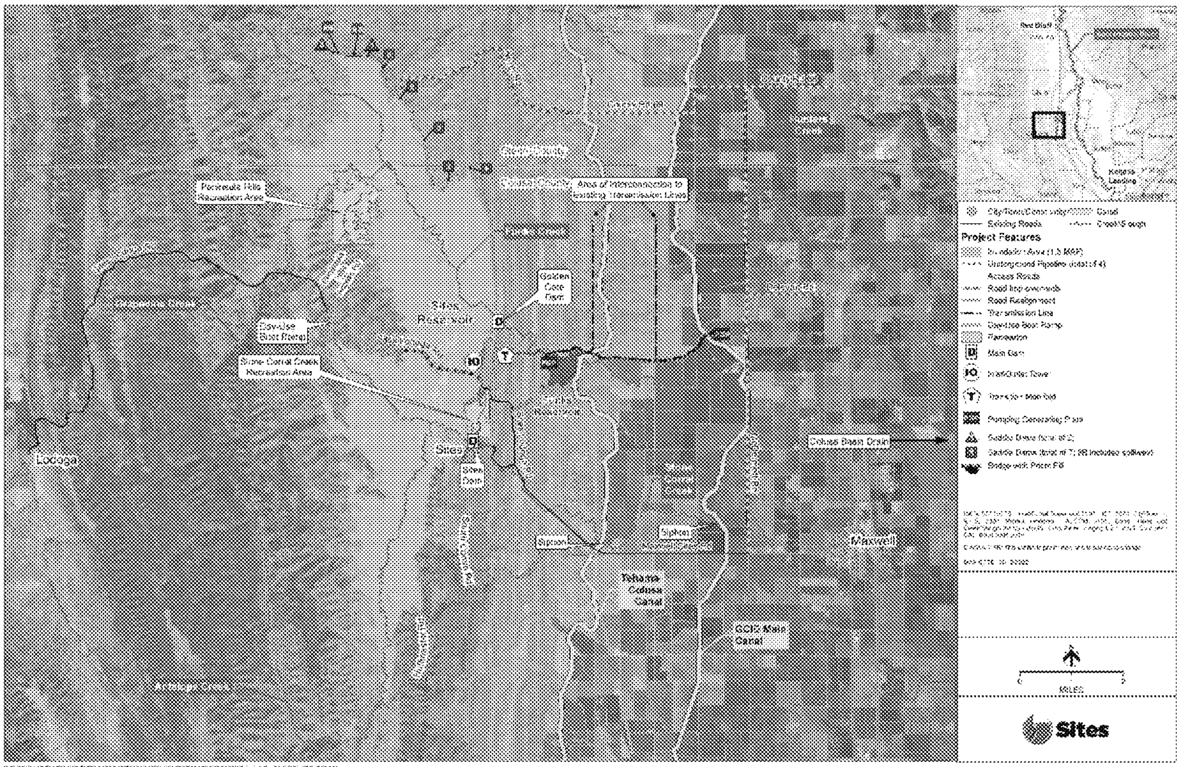

Figure 2. Project Area Overview

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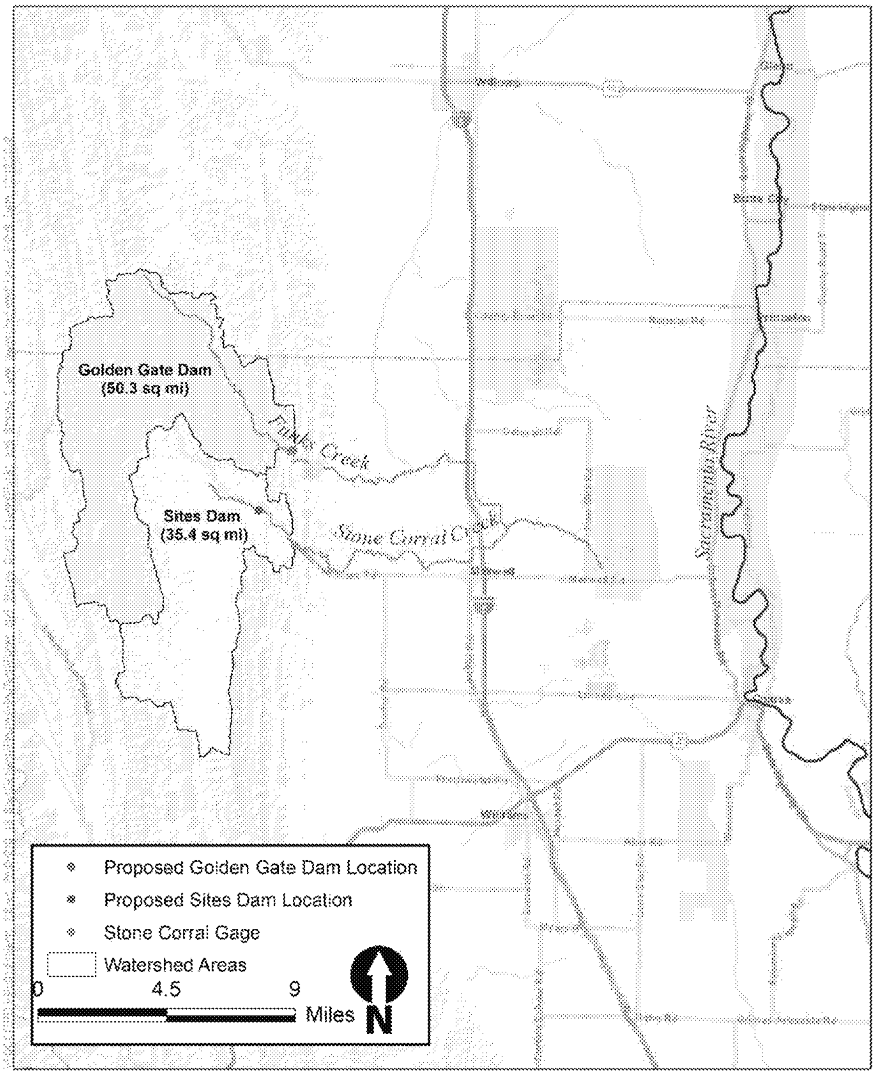
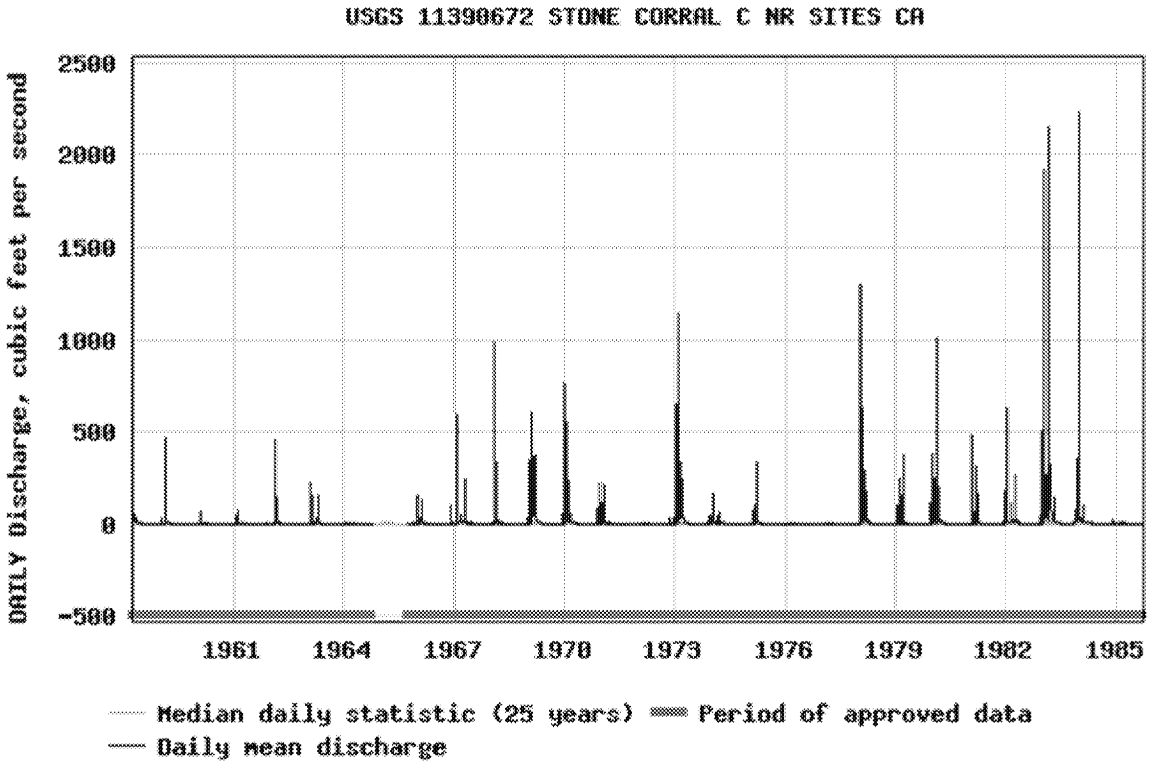


Figure 3. Stone Corral Creek and Funks Creek Watersheds Upstream of Proposed Sites Dam and Golden Gate Dam Locations. The Stone Corral Creek Gage Location captures the entire Sites Dam watershed (35.4 sq mi) upstream.



Source: U.S. Geological Survey stream gage 11390672

Figure 4. Mean Daily Flow in Stone Corral Creek near Sites (cfs)

Because the historical gage record for Stone Corral Creek is limited and Funks Creek is not gaged, historical stream gage data from Elder Creek was used to produce a longer-term estimate of streamflow on Stone Corral Creek and Funks Creek. The Elder Creek gage was chosen because it was the nearest gage on the valley floor with a long record of data available. It was assumed that Elder Creek has relatively similar precipitation and runoff patterns to Stone Corral Creek and Funks Creek. The streamflow of Elder Creek, located in Tehama County, has been measured since 1948 (USGS Gage No. 11379500). The gage site is approximately 49 miles northwest of the proposed Sites Reservoir, and has a drainage area upstream of the gage of 92.4 square miles (Attachment 1- MBK Engineers 2022). The overlapping period of gage records for Stone Corral Creek and Elder Creek (1958–1985) was used to determine a logarithmic correlation between the two gages for each month of the year. The developed streamflow timeseries was then further adjusted to account for the difference in watershed areas upstream of the old USGS Stone Corral Creek gage and the proposed location of Sites Dam. Tables 1a and 1b provide the results of this analysis, which shows the average monthly flow volume in acre feet per year and cubic feet per second for each water year type (MBK Engineers 2022). The average monthly volumes are calculated using the gage record for October 1958 through August 1985 with logarithmic monthly correlations for September 1985 through September 2021. Results are summarized by Sacramento Valley Water Year Type: wet, above normal, below normal, dry, and critical.

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Table 1a. Stone Corral Creek at Proposed Sites Dam Average Monthly Flow Volume (ac-ft) by Water Year Type (1958–2021)

Month	Wet	Above Normal	Below Normal	Dry	Critical	Average of All Years
Oct	0	0	0	0	0	0
Nov	42	11	2	5	0	17
Dec	872	242	29	47	54	336
Jan	3,365	2,825	711	345	171	1,663
Feb	4,487	4,667	1,283	135	307	2,317
Mar	2,135	1,522	407	264	179	1,039
Apr	901	319	114	25	35	375
May	136	119	15	7	9	65
Jun	20	8	2	1	1	8
Jul	1	0	0	0	0	0
Aug	0	0	0	0	0	0
Sep	0	0	0	0	0	0
WY Total	11,959	9,713	2,562	828	757	5,827

Table 1b. Stone Corral Creek at Proposed Sites Dam Average Monthly Flow Volume (cfs) by Water Year Type (1958–2021)

Month	Wet	Above Normal	Below Normal	Dry	Critical	Average of All Years
Oct	0	0	0	0	0	0
Nov	21	6	1	3	0	9
Dec	436	121	15	24	27	168
Jan	1,683	1,413	356	173	86	832
Feb	2,244	2,334	642	68	154	1,159
Mar	1,068	761	204	132	90	520
Apr	451	160	57	13	18	188
May	68	60	8	4	5	33
Jun	10	4	1	1	1	4
Jul	1	0	0	0	0	0
Aug	0	0	0	0	0	0
Sep	0	0	0	0	0	0
WY Total	5,980	4,857	1,282	415	378	2,910

2.1.2 Funks Creek

Funks Creek, a tributary to Stone Corral Creek, has a drainage area of 50.3 square miles upstream of the proposed Golden Gate Dam. From the proposed location of Golden Gate Dam, Funks Creek meanders through a series of low ridges and grazing lands for about 1.8 miles to Funks Reservoir. Funks Reservoir is a re-regulating reservoir on the TC Canal and is created by a low dam on Funks Creek. Funks Dam is operated by TCCA to manage water levels within the TC Canal. The Funks Dam gates are opened during large storm events to pass flood waters through Funks Reservoir and down Funks Creek to avoid compromising the TC Canal and its operations. With the exception of passing flood waters, the Funks Dam gates are operated in the closed position, but seepage through the dam gates maintains perennial flow for a short distance below the dam in Funks Creek.

Below Funks Dam, Funks Creek travels 3.9 miles through agricultural fields in a combination of natural and straightened channels to where it crosses the GCID Main Canal. While the GCID Main Canal passes under Funks Creek in a siphon, GCID releases water from the canal to Funks Creek. Similar to Stone Corral Creek, GCID uses the downstream portions of Funks Creek as part of its conveyance system to deliver water to agricultural fields. Approximately 2 miles northeast of Maxwell and 1 mile east of Interstate 5, Funks Creek flows into Stone Corral Creek.

There is no flow record for Funks Creek, but given the comparable size, geology, and topography of the two watersheds and their proximity to each other, Funks Creek seasonal flow patterns and flow magnitudes are likely similar to Stone Corral Creek.

The same correlation approach used to estimate streamflow in Stone Corral Creek cannot be followed to estimate streamflow in Funks Creek because there are no streamflow data available for Funks Creek. Therefore, flow in Funks Creek was estimated by prorating monthly Stone Corral Creek streamflow data by the ratio of Stone Corral Creek's and Funks Creek's watershed areas upstream of the proposed dam locations (MBK Engineers 2022). Tables 2a and 2b provide the results of this analysis and identify the average monthly flow volume in acre feet per year and cubic feet per second foreach water year type.

Table 2a. Funks Creek Average Monthly Flow Volume (ac-ft) by Water Year Type (1958–2021)

Month	Wet	Above Normal	Below Normal	Dry	Critical	Average of All Years
Oct	0	0	0	0	0	0
Nov	60	16	3	7	1	24
Dec	1,239	343	41	66	77	485
Jan	4,778	4,011	1,010	489	243	2,362
Feb	6,372	6,628	1,822	192	436	3,290
Mar	3,031	2,161	578	375	255	1,475
Apr	1,280	453	162	36	49	553
May	193	169	21	9	13	93
Jun	28	11	2	1	2	12
Jul	2	0	0	0	0	1
Aug	0	0	0	0	0	0
Sep	0	0	0	0	0	0
WY Total	16,984	13,793	3,638	1,176	1,075	8,275

Table 2b. Funks Creek Average Monthly Flow Volume (cfs) by Water Year Type (1958–2021)

Month	Wet	Above Normal	Below Normal	Dry	Critical	Average of All Years
Oct	**0**	**0**	**0**	**0**	**0**	**0**

Month	Wet	Above Normal	Below Normal	Dry	Critical	Average of All Years
Nov	30	8	2	4	1	12
Dec	620	172	21	33	39	243
Jan	2,389	2,006	505	245	122	1,181
Feb	3,186	3,314	911	96	218	1,645
Mar	1,516	1,081	289	188	128	738
Apr	640	227	81	18	25	277
May	97	85	11	5	7	47
Jun	14	6	1	1	1	6
Jul	1	0	0	0	0	1
Aug	0	0	0	0	0	0
Sep	0	0	0	0	0	0
WY Total	8,492	6,896	1,820	588	538	4,148

2.1.3 Physical Characteristics

The only drainages that exit Antelope Valley are Stone Corral Creek and Funks Creek. Each creek continues through the steeper, foothill environments and then transitions to the Sacramento Valley floor, where each is generally shallow and highly altered, primarily for water conveyance and agricultural purposes. Straight channels and angular turns associated with agricultural fields and roads indicate that natural channels have been at least partially modified. Along their reaches on the valley floor, these creeks are mostly confined to narrow channels between berms adjacent to agricultural fields and road prisms.

Stone Corral Creek and Funks Creek are largely devoid of riparian habitat in their upper reaches (foothill environments) due to heavy livestock use. In the lower reaches where the creeks run through and around agricultural fields, riparian habitat is variable and consists mostly of low shrubs, grasses, occasional oak, willows and cottonwood trees; however, some segments of Stone Corral Creek possess dense stands of mature riparian vegetation.

Although the reaches of interest have been modified by livestock grazing, channelization, irrigation conveyance systems and minor diversions, they are still expected to have available aquatic habitat (i.e., benthic macroinvertebrate [BMI]). They also both experience much of their natural hydrograph (albeit altered due to local conveyance) and fluvial geomorphic processes and provide water and sediment that ultimately flows into the Colusa Basin Drain during rain events.

3.0 Fish Monitoring

3.1 Purpose of Fish Monitoring Program

The purpose of a fish monitoring program in Stone Corral Creek and Funks Creek downstream of Sites Reservoir is to establish a pre-project baseline and post-operation assessment of the fish species present to determine the existing state of the fish population and whether it is maintained in good condition consistent with CFGC Section 5937 after project construction and operation.

3.2 Overview of Proposed Methods

Assessment of the goal to maintain fish in good condition in these ephemeral creeks consistent with CFGC Section 5937 would be made using a Before-After-Control-Impact experimental study design, using the reach with perennial flow below Funks Reservoir as a control. Sampling would be conducted to assess fish community and habitat present in the study area for up to 5 years prior to operation of the Project. Following completion of the pre-operation survey, fish communities and aquatic habitats in the study area would be monitored in a similar fashion for a 5-to-10-year period after the Project is operational. Fish community and habitat data that showed statistically significant negative departures from baseline data would trigger reassessment of downstream flow management under a proposed adaptive management plan.

3.2.1 Pre-operation Baseline Monitoring

Pre-operation baseline monitoring would be conducted within the study area to identify, quantify, and map habitats (Chapter 4, *SWAMP Bioassessment Study Designs and Methodology*), document aquatic species distribution and population characteristics (e.g., relative abundance, diversity), and identify triggers (e.g., decrease in relative abundance) for adaptive management actions. This monitoring establishes a baseline condition from which success criteria are measured and includes initial reconnaissance and pre-operation sampling.

The pre-operation surveys would first involve a reconnaissance survey to observe and record variables that may affect sampling efforts and establish monitoring stations. Data collection would include information about the site, habitat, and fauna that are observed during site visits. Aquatic habitat and fish species sampling would be conducted once the reconnaissance is complete and sampling stations have been established. Data would be collected via standardized electronic or paper forms by experienced biologists during assessments and sampling. Data collected as part of pre-operation efforts would be summarized into yearly reports and a final pre-operation baseline report to the Authority at the end of the pre-operation survey period. Surveys would provide the information required to characterize baseline conditions of the fisheries resources, as well as threats and stressors to fish species and habitat in the pre-operation conditions.

3.2.2 Operations Monitoring

Operations monitoring would occur periodically at the intervals specified herein. Operations sampling would document fish abundance, condition, and distribution and compare the results with data collected on habitat area, location, and climate-driven changes in habitat characteristics over time. Data from the fish study would be used in documenting compliance with CFGC Section 5937 with data from the SWAMP assessments providing additional details on overall stream status.

Operations sampling methods would be identical to the pre-operation sampling, including returning to established stations and tracking fish abundance, diversity, and distribution through time. Threats and stressors identified in the pre-operation survey would be assessed during operations surveys to differentiate changes in habitat or fish communities not related to the operation of the Project. Data collected as part of the operations sampling effort would be compared against the baseline data, as well as previous years' data and summarized into interim and final reports.

3.2.3 Fish Sampling Methods

Beach Seining

Seining is a low cost, low impact method for capturing aquatic organisms. The size of the seines used for sampling would depend on the size of the habitat being sampled. Larger seines may be up to 30 feet long, 6 feet high, with a mesh size of 0.25 inch and a pocket size of 5 feet by 5 feet. Smaller seines used for small pools and ponds may be 12 feet long, 4 feet high, with a mesh size of 3/16 inch and a pocket that is 5 feet by 5 feet. Seines would be used or deployed in conjunction with block nets to prevent fish from moving out of the area prior to being sampled. Captured specimens would be held in floating net pens or large aerated containers, based on site conditions, prior to being processed. Specimens would be identified to species, and the first 20 of each species would be measured for fork length to the nearest millimeter before being released at the capture site. Additional specimens would be tallied and released. Representative specimens would be photographed for positive identification.

Circumstances that may affect efficacy include the amount or type of benthic structure, presence/absence of aquatic vegetation, water clarity, flow rate, and water depth. Seining is most effective in smooth bottom habitats free of aquatic debris or vegetation, with elevated turbidity, and are shallow enough for biologists to wade in. When benthic structure is complex, water clarity is high, and habitats contain extremely deep, shallow, or rapidly moving water that may exclude biologists from deploying nets, efficacy is dramatically decreased.

Seines with a "bag" to minimize aquatic organism handling stress are preferred. Seines with a bag are also preferred where obstructions make access to the water (or deployment/retrieval of the seine) difficult (U.S. Fish and Wildlife Service 2012). Blocking nets typically improve efficacy by reducing opportunities for target species to move out of the area being seined. Where the area to be isolated for sampling includes culverts, deep pools, undercut banks, or other cover attractive to fish (e.g., thick overhanging vegetation, root wads, logjams) it may be appropriate to isolate a portion or portions of the study area in phases, rather than attempting to herd fish from the entirety of the work area in a single downstream pass.

Electrofishing with Block Nets

Previous work in Stone Corral Creek and Funks Creek indicates that total dissolved solids are high enough to prevent the use of electrofishing as a means of sampling (California Department of Fish and Game and California Department of Water Resources 2000). During reconnaissance surveys, basic water quality measurements would be taken to confirm this observation. If total dissolved solids values are above levels known to interfere with electrofishing, the method would be curtailed in favor of seining. If employed, electrofishing would be done with a Smith-Root type backpack electrofisher. Sections of creeks would be isolated using blocking nets before biologists wade into them, starting from the upstream net and moving downstream. Captured specimens would be held in buckets, floating net pens, or large aerated containers prior to being identified and measured as above for seine sampling. Effort would be calculated using shock time. If fish exhibit signs of stress, including symptoms of tetany or bruising, electrofisher settings would be adjusted accordingly to reduce impacts.

Visual Surveys

Any visual observations by biologists during reconnaissance and sampling of stream fauna would be systematically recorded based on pre-determined reach locations. This would include documenting amphibians and reptiles that may be observed incidentally during fish sampling efforts.

General Water Quality

Water quality data would be measured at every fish sampling location using a YSI Pro DSS unit (or similar collection device), following Chapter 3 of the 2016 version of the SWAMP *Standard Operating Procedures for the Collection of Field Data for Bioassessments of California Wadeable Streams: Benthic Macroinvertebrates, Algae, and Physical Habitat* (SWAMP 2016 SOP) (Ode et al. 2016a) and recorded on standard SWAMP data forms. Water quality data obtained would include temperature, specific conductivity, salinity, dissolved oxygen, turbidity, and pH.

3.2.4 Fish Response

Abundance and diversity

All sampling efforts would be quantified using catch per unit effort (CPUE). The CPUE would be computed for each sample method and assessed once multiple data sets are available for comparison. Numbers of individuals, weight, and area sampled would be recorded. A decline in CPUE, in comparison to baseline values and accounting for threats and stressors, would reflect a potential adaptive management trigger.

Condition

Condition factor (K) would be calculated for all fish specimens for which length and weight have been recorded. The condition factor of fish reflects environmental and biological circumstances and fluctuations in feeding conditions and physiological factors (Le Cren 1951). The condition factor also indicates changes in food reserves and can be used as an indicator of the general condition of aquatic organisms. Therefore, information on condition factor can be used to assess biological health of monitored organisms because the measure provides information about the specific condition under which organisms are developing (Araneda et al. 2008).

A decline in condition factor, in comparison to baseline values and accounting for threats and stressors, would reflect a potential adaptive management trigger.

Distribution

Fish presence would be recorded and tracked through the study area. Fish distribution would be determined through reconnaissance and pre-operation surveys, known distributions, and incidental observations made during other sampling efforts. Records may be kept as count data and volumetric data but would ultimately be provided as presence or absence of fish species within sampling reaches.

3.3 Timing and Frequency

The schedule and effort for the pre-operation and operation portions of the proposed study are detailed below. The pre-operation surveys would be five consecutive annual visits staged at any point prior to start of operation and within the seasonal restrictions indicated below. Monitoring efforts would be one-per-year visits each year following initiation of operation up to a 5- or 10-year timeline as determined by the Authority. For the purposes of this Aquatic Study Plan, it is assumed that sufficient access to the study area would be available in 2023.

Pre-Project implementation:

- Desktop scoping effort: lay out sampling reaches using geographic information system (GIS) data overlaid on aerial imagery, organize data sheets, and coordinate with water quality and SWAMP efforts. Spring 2022
- Initial reconnaissance: 2 days with 2-person crew; ideal timing would be when water levels are most restricted, which is typically in autumn.
- Pre-operation effort 1: 14 days with 4-person crew. 2023
- Pre-operation effort 2: 14 days with 4-person crew. 2024
- Pre-operation effort 3: 14 days with 4-person crew. 2025
- Pre-operation effort 4: 14 days with 4-person crew. 2026
- Pre-operation effort 5: 14 days with 4-person crew. 2027

Post-Project implementation:

- Operation effort 1: 14 days with 4-person crew. 2030
- Operation effort 2: 14 days with 4-person crew. 2031
- Operation effort 3: 14 days with 4-person crew. 2032
- Operation effort 4: 14 days with 4-person crew. 2033
- Operation effort 5: 14 days with 4-person crew. 2034
- Additional efforts up to 10 years after initial operation would be determined by the Authority.

The post-Project implementation schedule may be adjusted based on the Project construction schedule and construction completion.

Permitting Requirements

A CDFW Scientific Collecting Permit (Specific Use) or Memorandum of Understanding permit would be required to complete the study design as proposed. BMI samples would be the only collected species.

4.0 SWAMP Bioassessment Study Designs and Methods

4.1 Purpose of Bioassessment Monitoring Program

Stream bioassessment monitoring is a method of evaluating and monitoring the environmental health and integrity of freshwater wadeable streams by using BMI, water quality parameters, and PHAB conditions indicators of stream condition. Bioassessments are especially useful in tracking the aquatic conditions before and after a project is implemented to determine the project effects on aquatic communities. A SWAMP bioassessment that focuses on the relationships between PHAB, water quality, BMI, and algal communities would be conducted on the reaches downstream of the proposed impoundments on Stone Corral Creek and Funks Creek.

This information, along with the other studies (i.e., Fish Monitoring and Hydrogeomorphic Study), would help to inform the type of flow releases that should be made to the creeks under various operating conditions.

4.2 Overview of Proposed Methods

The bioassessment effort would be conducted using the methods described in the SWAMP 2016 SOP (Ode et al. 2016a, 2016b), or any updated version thereof. The reach-wide benthos method, which requires collection from each of 11 designated major transects across the sampling reach regardless of stream habitat type (e.g., riffle, run, pool), would be employed.

The ultimate number of individual sites, herein referred to as sampling reaches, on each creek would be based on access and safety; however, it is anticipated that five sampling reaches would be located on Funks Creek and that six sampling reaches would be located on Stone Corral Creek (Figure 5). Since there is no stringent guidance on establishing the number of bioassessment sampling reaches for a project such as this (Rehn pers. comm.), the number of sampling reaches was chosen to both best capture and quantify the two different elevational gradients within the study area (i.e., foothill and valley floor environments), and to have adequate spacing/distance between the sampling reaches (approximately 500 meters apart on Funks Creek above Funks Reservoir and approximately 2 kilometers apart elsewhere). Field and laboratory methods would be fully described in an associated Quality Assurance Project Plan.

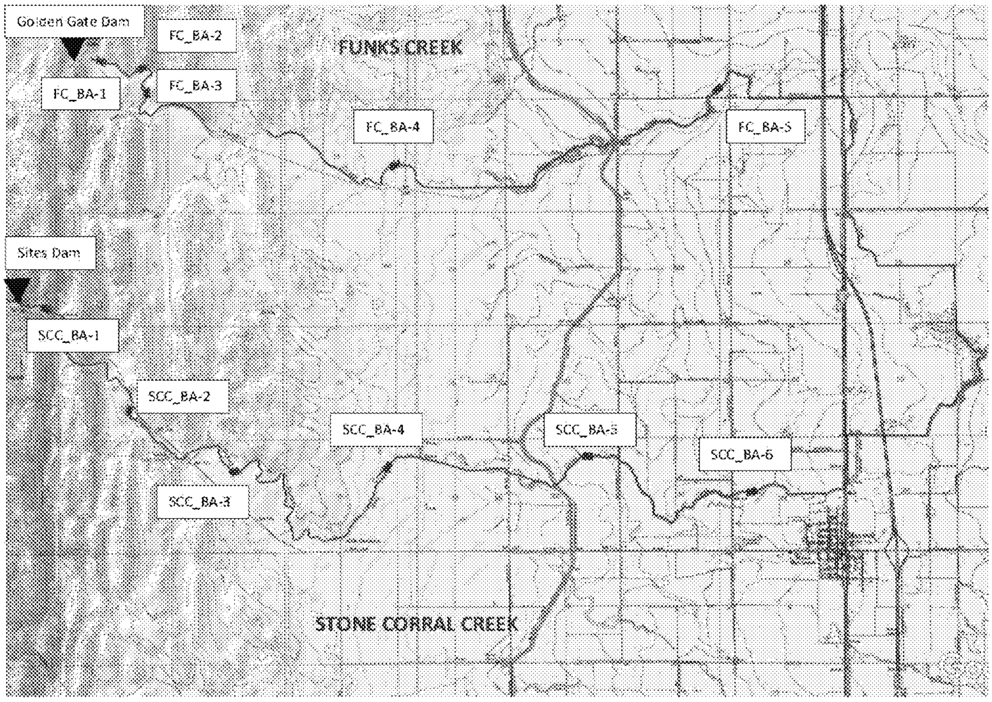

Figure 5. Potential Bioassessment Sampling Reaches, Stone Corral Creek and Funks Creek

4.3 Field Methods

This section summarizes the methods that would be used to collect all bioassessment data. All surveys would be performed by a qualified team of a biologist or biologists and a geomorphologist with expertise in benthic macroinvertebrate and algae collection, water quality monitoring, and PHAB data collection.

4.3.1 Sampling Reach Delineation

As described in Chapter 2 of the SWAMP 2016 SOP, the average wetted width of each sampling reach would be used to determine the sampling reach length (Ode et al. 2016a). The SWAMP 2016 SOP specifies standard sampling reach lengths that are based on wetted width (150 meters for sampling reaches with average wetted widths less than or equal to 10 meters, and 250 meters for sampling reaches with average wetted widths greater than 10 meters).

After the sampling reach length is determined, it would be laid out using marked surveyor's flags for transect identification and transects would be labeled according to the SWAMP 2016 SOP (main transects A–K and inter-transects AB, BC, etc.) for a total of 11 main transects and 10 inter-transects.

4.3.2 Basic Data Collection

Basic information collected at each sampling site would include project name, sampling reach name, time and date of survey, stream/watershed name, global positioning system (GPS) coordinates, and the names of the survey crew members. GPS coordinates would be recorded with an appropriate collection device (e.g., hand-held GPS receiver or iPad). Data collected at the sampling reaches would include water quality and stream discharge measurements, PHAB, and BMI and algae sample collections. The most recent version of the SWAMP *Stream Habitat Characterization Form Full Version* field forms would be used to enter data in the field.

4.3.3 Water Quality and Discharge Measurements

Water quality data would be measured using a YSI Pro DSS unit (or similar collection device), following Chapter 3 of the SWAMP 2016 SOP (Ode et al. 2016a) and recorded on standard SWAMP data forms. Water quality data obtained would include temperature, specific conductivity, salinity, dissolved oxygen, alkalinity, turbidity, and pH.

To determine alkalinity (which is a standard YSI is not capable of doing), a water sample would be collected at each sampling reach. The sample would be taken at approximately 10 to 15 centimeters below the water surface. Using gloves, collectors would fill the water sample bottles to the brim to ensure that air bubbles would not get trapped in the sample bottle. The bottle would then be placed on ice in a cooler until all field data collections were completed. In the evening following each day's sample collection, the water samples would be removed from the coolers and allowed to warm to room temperature. Alkalinity would then be determined by the double endpoint titration method using a Hach Digital Titrator.

Stream discharge would be measured using a Marsh-McBirney Flo-Mate Model 2000 flow meter and following the Velocity Area Method (Module O in Chapter 8 of the SWAMP 2016 SOP (Ode et al. 2016a, 2016b). Efforts would be made to select a stream transect with a relatively uniform cross section and laminar flow, and at least 20 equally spaced data points would be used to estimate streamflow.

4.3.4 Physical Habitat Assessment and Photo-Documentation

As required by the SWAMP 2016 SOP, PHAB information would be collected at the sampling reaches at each transect and inter-transect location. At the 11 main transects, the full measurements listed in Chapter 6 of the SWAMP 2016 SOP would be taken (Ode et al. 2016a, 2016b). At the 10 inter-transects, fewer measurements would be taken per the SWAMP *Stream Habitat Characterization Form Full Version* field forms.

Digital photo documentation for each sampling reach would consist of upstream and downstream views at transects A, F, and K (i.e., the downstream, middle, and upstream portions of the sampling reach). Incidental observations such as recent rainfall, fire effects, flooding, and other disturbances would also be recorded.

At each sampling reach, reach-wide PHAB conditions relative to three Rapid Bioassessment Protocol (RBP) habitat parameters would be evaluated based on visual observations. These observations would include epifaunal substrate/cover, sediment deposition, and channel alteration. Each of these parameters would be scored using the following numeric value and ranked using the following 20-point scale, per the SWAMP 2016 SOP.

- 1–5 rank as poor
- 6–10 rank as marginal
- 11–15 rank as suboptimal
- 16–20 rank as optimal

4.3.5 Benthic Macroinvertebrate Sample Collection

BMI collection would be conducted according to the SWAMP 2016 SOP, using the reach-wide benthos method, which requires collection from each of the 11 major transects across the sampling reach regardless of stream habitat type (e.g., riffle, run, and pool). The BMI samples would be collected 1 meter downstream of each major transect by sampling a 1-foot-square area using a D-frame net. The sampling would begin at transect A (the downstream end) and continue upstream to transect K, with the sample location alternating from left (25% of width), to center (50% of width), to right (75% of width) on each subsequent transect.

All collections from the 11 major transects would be composited into a single sample and transferred into a 1-liter, wide-mouth plastic jar and preserved with 95% ethanol, following the SWAMP 2016 SOP. Samples would be labeled with collection site, time, and collector's name; and a chain-of-custody form would be filled out to accompany the samples on their way to the laboratory for identification. Replicate samples would be collected according to the SWAMP 2016 SOP at one sampling reach for quality assurance/quality control (QA/QC) purposes.

4.3.6 Algae Sample Collection

Algae would be collected in the same manner as the BMI samples, except that the algae would be collected 25 centimeters above the location where the BMI sample would be located. Algae samples would be collected using the sampling tools identified in the SWAMP 2016 SOP, which vary according to the substrate being sampled. A rubber delimiter would be used for large gravel and cobble; a PVC delimiter would be used for fines and gravels; and a syringe scrubber would be used for bedrock and large boulders (if present).

Similar to the BMI sampling, each algae sample collected at the 11 major transects would be composited into a single sample for processing. The processing of the algae would follow the SWAMP 2016 SOP, which would involve removal of algae from the substrates collected and processing the sample for the four algae analyses: quantitative soft-bodied algae, quantitative diatoms, ash-free dry mass (AFDM), and chlorophyll a. A soft-bodied algae qualitative sample would also be collected from each sampling reach by collecting a composite of all types of soft-bodied algae observed within the sampling reach into a single sample. This sample would aid in the identification of soft-bodied algae in the quantitative sample and would be used in the calculation of some of the algae metrics. Replicate algae samples would be collected at the same sampling reaches where replicate BMI samples would be collected.

4.4 Laboratory Processing

This section summarizes the methods that would be used to process all bioassessment data.

4.4.1 Water Quality

Water samples would be collected at each sampling reach to determine total nitrogen and total phosphorus, constituents necessary for helping to determine algal results. Samples would be sent to a local water quality processing laboratory in northern California. The water quality analyses would be consistent with SWAMP protocols for water chemistry. Total nitrogen would be analyzed according to U.S. Environmental Protection Agency Method 351.2, and total phosphorous would be analyzed according to Standard Methods 4500-P B and 4500-P E.

4.4.2 Benthic Macroinvertebrate Sample Processing

BMI sample taxa identification would be conducted by an outside laboratory (most likely by the Chico Aquatic Bioassessment Laboratory [Chico ABL] in Chico, California). BMI samples would be picked, sorted, and identified completely or until a 600 count (SAFIT Level 2) is reached. Chico ABL follows QA/QC procedures developed under the SWAMP program.

4.4.3 Algae Sample Processing

Five types of algae would be collected and processed: qualitative grab, soft-bodied algae, diatoms, AFDM, and chlorophyll a. The qualitative grab, soft algae, and diatom samples would be sent to the CDFW Group at the Marine Pollution Studies Laboratory at Moss Landing Marine Laboratories (MPSL-MLML). MPSL-MLML would report the data in SWAMP template formats. MPSL-MLML would calculate the Algae Stream Condition Index (ASCI) from the data. The samples of AFDM and chlorophyll a would also be sent to MPSL-MLML, who would report the data in California Environmental Data Exchange Network template formats. PSL-MLML follows the QA/QC procedures developed under the SWAMP.

4.5 Data Analysis

PHAB information would be entered using the SWAMP Version 2.5 bioassessment data entry forms (Marine Pollution Studies Laboratory 2022) and then loaded into the Microsoft Structured Query Language (SQL) Server database of the MPSL-MLML. BMI and algae taxonomy data, as well as water chemistry data would be loaded from Microsoft Excel templates into the same Microsoft SQL Server database. The data entry forms and templates would be obtained from the MPSL-MLML Data Center website. All data would be verified and checked for completeness after input into the database.

4.5.1 Physical Habitat Information

PHAB data would be entered by the MPSL-MLML using the SWAMP Bioassessment Field Form Microsoft Access database, and then loaded into the MPSL-MLML's Microsoft SQL Server database. After loading, additional error and completeness checks would be run following SWAMP business rules. The data would be sent to the California Environmental Data Exchange Network, where it would be available to the public for viewing and download.

PHAB metrics would be calculated using the SWAMP Bioassessment Reporting Module. The SWAMP protocol contains a subset of parameters measured within the U.S. Environmental Protection Agency's Environmental Monitoring and Assessment Program for freshwater wadeable streams; therefore, many of their metrics described in Kaufmann et al. (1999) form the basis of the SWAMP Bioassessment Reporting Module output.

SWAMP has developed a PHAB Index similar to the California Stream Condition Index (CSCI) (Section 4.5.3, *Benthic Macroinvertebrates*) for BMI data. The PHAB Index (called the *IPI*) combines eight GIS-calculated metrics with 12 PHAB metrics to produce one IPI value (Rehn et al. 2018). For the purposes of statewide assessments, the IPI has thresholds of physical condition: greater than or equal to 0.94 indicates likely intact condition; 0.93 to 0.84 indicates possibly altered condition; 0.83 to 0.71 indicates likely altered condition; and less than or equal to 0.70 indicates very likely altered condition.

In addition, the results would be compared to key stressor thresholds that best highlight the conditions at the sampling reaches identified in *Ecological Condition Assessment of California's Perennial Wadeable Streams: Highlights from the Surface Water Ambient Monitoring Program's Perennial Stream*

Assessment (PSA) (2000–2007) (Ode et al. 2011). These select stressor thresholds are not regulatory limits set by SWRCB; rather, they are biology-based stressor thresholds developed by researchers as an objective means to set meaningful, regionally appropriate water quality standards. Two statewide and regional PHAB biological stressor thresholds, the Percent Fines and Sand and Mean Embeddedness thresholds, are examples of biological stressor thresholds that would be appropriate to analyze for this Project.

4.5.2 Water Quality

Similar to the PHAB analysis described above, water quality results would be compared to key stressor thresholds that best highlight the conditions at the sampling reaches identified in *Ecological Condition Assessment of California's Perennial Wadeable Streams: Highlights from the Surface Water Ambient Monitoring Program's Perennial Stream Assessment (PSA) (2000–2007)* (Ode et al. 2011).

4.5.3 Benthic Macroinvertebrates

MPSL-MLML would be contracted to assist in the analysis of the BMI data. MPSL-MLML would use the BMI taxonomic data obtained from Chico ABL to calculate CSCI scores for each sampling reach. The CSCI is a statewide biological scoring tool that translates complex data about individual BMIs found living in a stream into an overall measure of stream health (Rehn et al. 2015).

CSCI scores and output would be calculated using R scripts defined in Mazor et al. (2017). CSCI score categories would be applied as defined in Rehn et al. (2015).

- Less than or equal to 0.62: very likely altered
- 0.63–0.79: likely altered
- 0.80–0.91: possibly altered
- Greater than or equal to 0.92: likely intact

MPSL-MLML would also calculate several BMI metrics from the taxonomic data for each sampling reach. These individual metrics would be reviewed to discuss the individual results for each sampling reach and event. Representative metrics may include measures of taxa richness, composition, tolerance, functional feeding groups, and habit measures. These other metrics may be more insightful for determining the biological integrity of the BMI communities than the CSCI scores alone (at least in the valley floor sampling reaches), as valley floor reference sites (the sites used in the CSCI calculations) are relatively limited in abundance (Rehn pers. Comm.).

4.5.4 Algae

Diatoms and Soft Algae

MPSL-MLML would be contracted to calculate the statewide diatom, soft algae, and hybrid ASCI and associated metrics. These predictive biological indices replace past regional indices with a statewide index allowing for improved comparisons across diverse landscapes in a consistent and comparable manner. While ASCI can be calculated for soft algae and diatoms separately, the hybrid ASCI produces stronger species distribution models for more accurate and integrative assessments of biological condition.

Chlorophyll a and Ash-Free Dry Mass

Ode et al. (2011) in their analysis of the results from the statewide Perennial Stream Assessment between 2000 and 2007, have included stressor thresholds for chlorophyll a and AFDM. These thresholds are more protective than levels proposed by previous authors, which were 100 milligrams per square meter for chlorophyll a and 50 grams per square meter for AFDM (Barbour et al. 1999, Welch et al. 1988, Dodds et al. 1998, Sosiak 2002, Dodds and Welch 2000, U.S. Environmental Protection Agency 2000, Biggs 2000). The thresholds proposed by Ode et al. (2011) are not regulatory limits or requirements but rather recommendations. The chlorophyll a and AFDM stressor thresholds (statewide and regional) would be evaluated for each sampling reach by MPSL-MLML.

4.6 Timing and Frequency

The bioassessment surveys would be conducted during the appropriate index period for Central Valley streams (June through August), which is typically 4 to 6 weeks following the last winter storm event. Depending on stream conditions, however, bioassessment surveys may need to be performed prior to the appropriate index period to ensure adequate flow for benthic and algal sampling is present. Baseline (pre-operation monitoring) would occur in the spring for (possibly) 5 years prior to project operation. Follow-up (baseline) surveys would be conducted on an annual basis during the same period for up to 10 years after operation activities are initiated. The Authority and the relevant agencies (CDFW, USFWS, and Colusa County) would be consulted if the frequency of monitoring would be shortened after 5 years.

4.6.1 Permitting Requirements

A CDFW Scientific Collecting Permit (Specific Use) or Memorandum Of Understanding permit would be required to complete the study design as proposed. BMI samples would be the only collected species.

4.7 Additional Water Quality Measurements

In addition to the standard water quality measurements included in the SWAMP bioassessment as described above, samples would be collected for additional laboratory measurements. The objectives for taking these additional measurements would be to compare pre-Project and Project values, determine any effect of operational adjustments on sampled water quality constituents, and compare measurement values to key stressor thresholds. These additional measurements include:

- **A suite of total and dissolved metals and metalloids**. The suite includes aluminum, arsenic, cadmium, chromium (total), chromium, copper, iron, lead, manganese, mercury, methylmercury, nickel, selenium, silver, and zinc.
- **Cyanobacteria and cyanotoxins**. The cyanobacteria water samples would be collected for the purpose of laboratory analysis for cyanobacteria presence and density and the presence of cyanotoxins (specifically microcystins, anatoxin-a, and cylindrospermopsin).
- **Methymercury in fish tissue**. Level I trophic level fish would likely be more abundant than higher trophic level fish, so the measurements of methylmercury concentrations in fish tissue would focus on these fish. Higher trophic level fish would be sampled intermittently as available. To assess methylmercury in fish tissue, sampling would be conducted using the SWAMP protocol for California rivers and streams (California Water Boards 2011 or most current).

When these additional water quality samples and fish are collected, the following basic survey information and data described above would be collected: project name, sampling reach name, time and date of survey, stream/watershed name, and the names of the survey crew members. Incidental observations such as recent rainfall, fire effects, flooding, and other disturbances would also be recorded. Basic data collected at the sampling sites would include stream discharge measurements, temperature, specific conductivity, dissolved oxygen, turbidity, pH, and water samples for total nitrogen and total phosphorus laboratory measurements. In addition, water samples would be collected for laboratory measurements of dissolved organic carbon and hardness as these parameters influence water quality standards for aquatic life protection for some metals.

These measurements would be taken twice a year, once during a high flow period and once during a low flow period, at the upstream and downstream bioassessment sampling locations on each creek. Sampling would occur during the same years as the rest of the bioassessment studies.

5.0 Hydrogeomorphic Study

5.1 Purpose of Study

The overall purpose of the Hydrogeomorphic Study would be to characterize historical and present-day streamflows, including baseflow during the spring and summer months, on Stone Corral Creek and Funks Creek; the relevant geomorphic characteristics of each creek (herein called *geomorphic indicators*); and flow levels necessary for channel maintenance of geomorphic processes required to maintain the channels in their current condition.

A Hydrogeomorphic Study with quantitative and qualitative monitoring data to fully characterize the existing hydrologic regime of Stone Corral Creek and Funks Creek, as well as the overall type and abundance of sediment available for aquatic organisms, would be developed. To inform the appropriate streamflows for the creeks under inquiry, a geomorphic assessment would constitute the first step in the analysis. The channel segments upstream of the dams would also be rapidly assessed to provide a greater understanding of the local watershed geomorphic characteristics. The focus of the geomorphic assessment would be to determine the dominant geomorphic processes, document the surrounding landforms and channel bed topography, and to determine how the observed morphology of each creek is influenced by the hydrologic regime and the surrounding land uses. Likewise, collection of geomorphic information would aid in the determination of overall channel stability for each creek, which has important implications for the proposed releases.

The Hydrogeomorphic Study to examine the hydrologic regime of Stone Corral Creek and Funks Creek would include a desktop modeling exercise, as well as installation of stilling wells, staff gages, and real-time water surface level collection devices. The goal of the Hydrogeomorphic Study would be to evaluate the physical and hydrologic condition of the reaches of interest within both Stone Corral Creek and Funks Creek. This information, along with the other required studies as discussed in previous chapters (i.e., Fish Assemblage Study and SWAMP bioassessment study), would help to inform the type of flow releases that should be made to the creeks under various Project operating conditions.

After completion of the baseline studies, consideration would be given to when and how flows would be released and whether a portion of these flows are needed to maintain fluvial geomorphic processes (based on the findings from the geomorphic assessment).

5.2 Study Design

The (baseline) Hydrogeomorphic Study components are discussed below. *Field site locations* are applicable to the geomorphic component of the Hydrogeomorphic Study; *hydrologic monitoring locations* represent the potential locations where stilling wells, staff gages, and real-time water surface level collection devices would be installed (i.e., the hydrologic component of the Hydrogeomorphic Study). The ultimate number of field site locations on each creek would be based on access and safety; however, it is anticipated that five sites would be located on Funks Creek and that six would be located on Stone Corral Creek. The locations for the geomorphic component of the Hydrogeomorphic Study would presumably be the same as the bioassessment sampling reaches as part of the SWAMP bioassessment study as described in Chapter 4 (Figure 5). The ultimate number of hydrologic monitoring locations on each creek would primarily be based on access, due to the need for monitoring during and after precipitation events. It is anticipated that two sites would be located on each creek: one in the foothills and one on the valley floor as shown on Figure 6.

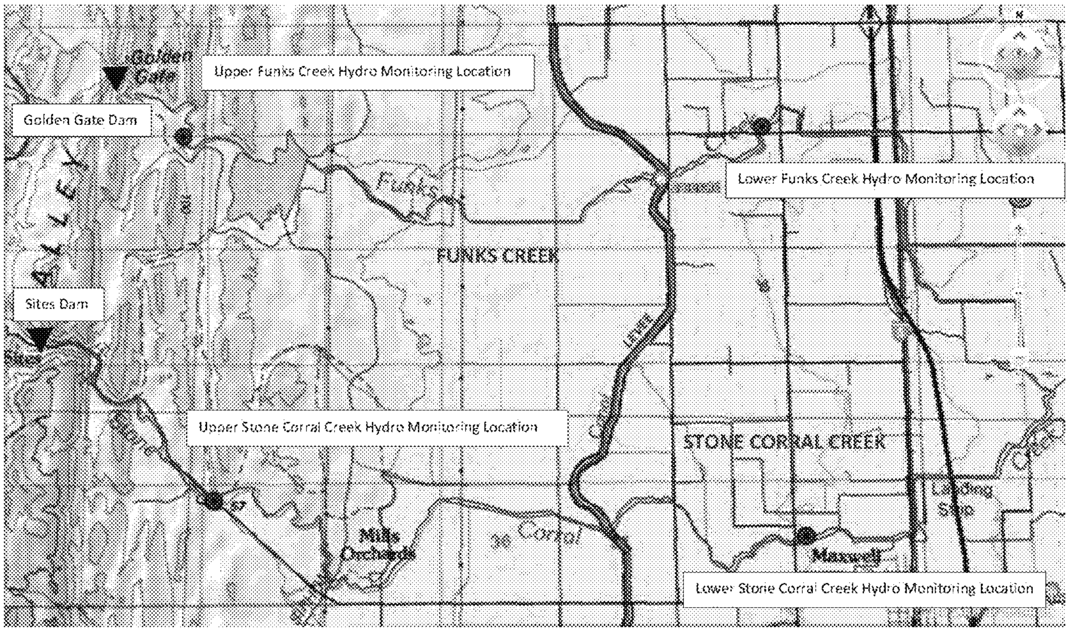

Figure 6. Potential Hydrologic Monitoring Locations, Stone Corral Creek and Funks Creek

5.2.1 Geomorphic Conditions

Data collected during the geomorphic component of the Hydrogeomorphic Study (geomorphic assessment) would include a host of geomorphic attributes, or indicators, as described below. Topographic data (longitudinal profile and cross sections) needed for the hydrologic model (further described below) would also be collected during the geomorphic assessment. The geomorphic assessment would be conducted by a geomorphologist with expertise in channel and floodplain dynamics, channel stability analyses, and topographic surveying techniques.

The geomorphic assessment would include evaluation of the following indicators.

- Channel classification
- Local watershed inputs
- Hydrologic and flow patterns
- Riparian vegetation condition
- Bankfull width and depth and wetted width
- Bank instability and bank characteristics
- Channel bed substrate composition and embeddedness
- Channel complexity
- Degree of channel incision
- Stage of channel evolution
- Cross section and longitudinal profile surveys

These indicators would be assessed for each field site location (Figure 5). In addition, at least three permanent cross sections would be established within each field site location and within each hydrologic monitoring location (Figure 6) for collection of quantitative channel morphology information and required modeling input. Evaluation methods for these indicators are described below.

Channel Classification

Stream and river segments can be grouped into three generalized classifications based on their position in the watershed and the relative balance of transport capacity to sediment supply (Montgomery and Buffington 1998). Headwater source areas are typically transport-limited (often due to limited channel runoff) but do offer sediment storage that is intermittently initiated under large flow events, debris flows, or other gravitational events. Transport segments are composed of morphologically resilient, supply-limited reaches (e.g., bedrock, cascade, and step-pool) that rapidly convey increased sediment inputs. Response segments consist of lower-gradient, more transport-limited depositional reaches (e.g., plane-bed, pool-riffle) where channel adjustments occur in response to changes in sediment supply delivered from upstream.

Based on field observations and the stream classification methodology of Montgomery and Buffington (1998), each field site location would be classified accordingly. The classification would aid in the determination of the sediment regime and bedform morphology, which would help characterize the stream habitat and function of each field site location on the reaches of interest.

Local Watershed Inputs

Any major inputs of sediment and runoff into the field site locations (e.g., landslides or other mass wasting features, recent burn scars) would be summarized. The objective would be to identify any land use changes that could alter the balance of sediment supply and runoff that could lead to future instability (e.g., channel aggradation of degradation) within the reaches of interest. This would aid in the determination of channel stability and the potential for available habitat to be disrupted or altered in the vicinity of the field site locations.

Hydrologic and Flow Patterns

The hydrologic pattern would be determined throughout the length of the field site locations and would include identification of whether streamflow is perennial, intermittent, or ephemeral. Perennial streams are those which flow year-round; intermittent streams are those which flow for only certain times of the year and receive water from both surface water and groundwater; and ephemeral streams are those which have their channels above the water table year-round and only receive water from surface runoff. This geomorphic indicator would rely on the field-based hydrologic component of the overall Hydrogeomorphic Study, as described below.

Riparian Vegetation Condition

Riparian vegetation is an important indicator for overall stream habitat and function as it serves to stabilize streambanks and allows for canopy cover to create suitable water temperatures for aquatic species. Riparian condition refers to a description of the general health of the riparian area, focusing on the amount and type of vegetative cover.

Within each field site location, riparian condition would be described as low (0–25 % vegetative cover), moderate (25–50 % vegetative cover), high (50–75 % vegetative cover), or very high (75–100 % vegetative cover). The size and approximate age of any riparian vegetation growing in the channel bed would be documented because this is evidence of channel adjustment and possible re-stabilization from a prior disturbance.

Bankfull Width and Depth and Wetted Width

Bankfull width and depth measurements would be recorded to assess the hydraulic capacity of the channel in the field site locations. Specifically, a geomorphic or effective bankfull surface would be identified in the field. The geomorphic bankfull or effective surface is the surface that gets inundated by the discharge that performs the most geomorphic work on a system, typically a flow that occurs every 1.5 to 2 years (Knighton 1999). This discharge, known as the geomorphic bankfull discharge, is defined as that water discharged when stream water just begins to overflow into the active floodplain. The geomorphic bankfull or effective surface would be identified based on the methodology of Harrelson et al. (1994) and Hauer and Lamberti (1996). Once this surface is recognized, width and depth measurements would be recorded.

Like bankfull width and depth measurements, wetted width and depth measurements would be recorded. Specifically, the wetted surface would be identified in the field and width and depth measurements would be recorded.

Bankfull and wetted width and depth data collection would help to determine the size of the channel, which would help in assessing overall available habitat conditions in the field site locations and reaches of interest.

In addition, the "active channel" width would be identified, which typically represents a typical low to moderate flow regime and is usually bounded by the width of the in-channel vegetation.

Bank Instability and Bank Characteristics

The term *bank instability* refers to streambanks that are either actively retreating or have the potential to retreat soon. In brief, weakening processes are any bank or near-bank processes that act to erode or prepare streambanks for further erosion (Lawler 1992). The purpose of assessing this indicator would be to identify fluvial erosion (erosion associated with flowing water) and bank failure (erosion associated with gravitational forces and weakening processes). Fluvial erosion is closely related to boundary shear stress, which can be loosely approximated by unit stream power variations, and bank failure is collapse of all or part of the streambank in situ (Lawler 1995).

Bank stability would be defined as the natural streambank that has stable groundcover. Stable ground cover includes rooted trees, shrubs, herbaceous plants, and naturally occurring rocky substrates. Bank composition and bank height/angle would also be determined. The results, in conjunction with the other indicators, can be used to detect where the channel may be downcutting as suggested by over-steepened banks, and can also be used to describe the potential for the channel to potentially laterally migrate and increase the risk of bank instability.

Bank stability analyses would aid in determination of the sediment regime and bedform morphology, which would help characterize the stream habitat and function of the field site locations, as well as the determination of channel stability and the potential for available habitat to be disrupted or altered in the field site locations.

Channel Bed Substrate Composition and Embeddedness

Substrate composition and embeddedness refer to the size of the substrate materials on the channel bed, and the degree to which these materials are embedded. These conditions indicate how frequently the channel substrate is mobilized. Substrate composition and embeddedness would be measured using the methods described by Bunte and Abt (2001). Substrate composition would identify the available substrate (overall type and abundance) for aquatic species in the vicinity of each field site location.

Channel Complexity

The presence or absence of gravel bar development and evidence of scour and/or deposition would be determined throughout the length of each field site location. Pool and riffle habitats containing in-channel structures (e.g., instream woody material) that create complexity and habitat niches for aquatic organisms would also be documented. Basic channel or habitat units (e.g., pool, riffle, and flatwater) would be delineated according to standard habitat mapping descriptions in each field site location. A rough proportion of unit types would be calculated.

Channel or habitat units would be defined as follows.

- **Pool.** Slow water, length, and width at least one-half the bankfull channel width, and a 10-inch minimum residual pool depth. Subcategories define the general type of pool and include scour (lateral, channel, channel confluence, plunge), dam, and backwater, as defined by Overton et al. (1997).
- **Riffle.** Swiftly flowing, turbulent water, some partially exposed substrate, substrate cobble, and/or boulder dominated (McCain et al. 1990).
- **Flatwater.** Wide, uniform channel bottom, low to moderate water velocity, and little surface agitation. Encompasses any areas that do not qualify as pool or riffle (McCain et al. 1990).

If appropriate (i.e., if the habitat diversity merits such a method), the field site locations would be habitat typed to provide a more detailed stream habitat inventory. Stream habitats would be delineated into one of the six Level-III habitat classification types (Flosi et al. 2010) based on morphological characteristics. These include overall channel gradient, water velocity and depth, substrate, and, where applicable, the channel features (e.g., boulder, bedrock, woody material, converging flow) causing the formation of the habitat unit through scour and sediment deposition (Flosi et al. 2010). Channel/habitat type determination would allow for identification of available habitat types for aquatic species.

Degree of Channel Incision

The degree to which the channel is incised would be recorded as negligible, low, moderate, high, or very high. The degree of incision would be qualitatively analyzed using the following criteria.

- **Identification of any Quaternary landforms on the floodplain (e.g., terraces, low floodplain, fan, etc.).** Terraces typically have steep streambanks, and the channel may not necessarily be incised. Steep, unstable streambanks adjacent to a low floodplain surface, however, typically indicate incision.
- **Identification of bedforms downstream of the site where and if the channel is less incised.** Bed and streambank material from incised channels would typically be deposited downstream in somewhat uncharacteristically large deposits on the channel bed (downstream aggradation).
- **Recognition of base level changes downstream.** Dams and other barriers can create upstream changes in channel bed elevation (i.e., headward migration of incision).
- **Visual survey of channel bed at the field site location.** Channel or habitat sequences, such as pool-riffle sequences, are rare in incised channels, and those that do exist do so for only limited time

intervals. Additionally, the increased depth of flow associated with incision, coupled with an increased flashy regime, results in bed armoring and a decreased frequency of bed mobilization.

- **Determination of the health of the riparian and floodplain plant species.** Plants that are found in similar, un-incised reaches are usually not present in incised reaches. No vegetation at all is an indicator of no hydrologic interaction between the floodplain and the channel and, therefore, incision.
- **Identification of recent evidence of overbank deposition of fine sediment, plant debris, or other organic matter.** A channel that floods its streambanks frequently would typically have splay (i.e., sand) deposits and vegetation with a smoothed, flooded appearance in the downstream direction. Natural levee development is also an indication of frequent flooding.

Stage of Channel Evolution

A stream evolution model (Cluer and Thorne 2013) would be applied to the entirety of the reaches of interest on Stone Corral Creek and Funks Creek to provide a template for understanding geomorphic responses and processes within the immediate watershed. The stream evolution model of Cluer and Thorne (2013) revisits and updates two well-established channel evolution models (Schumm et al. 1984, Simon and Hupp 1987) in light of recent research and the authors' practical experiences.

In addition, a channel stability analysis would be conducted at each field site location. The chosen methodology would be dictated by site conditions but could include the methods as presented in the modified Pfankuch procedure (Pfankuch 1975) as described by Rosgen (2001), Simon and Down (1995), Bledsoe et al. (2010), or other applicable method. The stream evolution model and the channel stability analyses would aid in the determination of how on Stone Corral Creek and Funks Creek may evolve (e.g., deepen/widen) or remain in a state of equilibrium in the future, thus, having implications for the available habitat within the channels.

Cross Section and Longitudinal Profile Surveys

As mentioned above, at least three permanent cross sections would be established within each field site location (Figure 5) and within each hydrologic monitoring location (Figure 6) for collection of quantitative channel morphology information and required modeling input. Permanent cross sections would be established perpendicular to the primary channel following the methodology of Harrelson et al. (1994). Each transect would be surveyed using ground-based surveying equipment to capture and track channel morphology. Elevations along the cross sections would be collected at intervals close enough to capture slope breaks and distinct morphological features within the floodplain (if present), and along the channel sides and bottom.

The location of each cross section would be permanently marked in the field using 4-foot-tall metal t-posts or wooden lathes (to easily find the general transect location) and with rebar driven vertically into the ground surface, capped with an appropriate cover (to establish known permanent elevations [permanent monuments or benchmarks] on each side of the transect). The permanent benchmarks for each transect would be placed in a stable location above the active channel on the left and right (as viewed facing downstream) banks or terraces of the channel. Transect endpoints (i.e., the permanent monuments) would be documented using a GPS receiver. Representative photographs would be taken at each cross section.

In addition to the cross sections, a longitudinal profile would be surveyed throughout the length of the channel within a field site location. The spacing between channel bed data points would vary depending on the complexity of the channel bed characteristics. Digital photographs would be taken in the upstream and downstream directions at various locations throughout the longitudinal profile. The location(s) of each cross section would be surveyed on the longitudinal profile for graphical plotting purposes.

Channel Geometry Metrics

As mentioned previously, bankfull width and depth measurements would be recorded to assess the hydraulic capacity of the channels. This would be completed at the cross sections measured in the field. In addition to bankfull, wetted, and active channel width and depth measurements, the bankfull and entire channel width-to-depth ratio would be calculated for each cross section, and sinuosity and gradient of the longitudinal profile would be determined.

5.2.2 Hydrologic Conditions

The hydrologic component of the Hydrogeomorphic Study would consist of both desktop (modeling and historical conditions review) and field-based efforts (generation of stage-discharge relationships), both of which are summarized below. The desktop effort would provide detailed information on various (modeled) flows of interest (i.e., the 2-year, 5-year, 10-year, 50-year, and 100-year flow events), while the field-based efforts would validate/calibrate the modeling results via collection of real-time streamflow data, especially for smaller streamflow events (the flows that are expected to occur most of the time on each creek).

Summary of Modeling Approach

A HEC-HMS rainfall-runoff-routing watershed hydrology model would be created to generate hydrographs for both Stone Corral Creek and Funks Creek. Inputs into the hydrology model would include watershed land use, percent impervious inputs, soil types, precipitation and evapotranspiration, drainage network characteristics, and topography (which would be generated from available light detection and ranging [LiDAR] technology).

The topographic surveys as described above would also serve to augment the existing LiDAR data with on-the-ground data to better capture topography in areas requiring additional detail (such as densely vegetated areas). The topographic surveys would be tied into the State Plane Coordinate System and would be sufficient to generate contours at a 1-foot interval. The data collected via the topographic surveys would also be required for generation of stage discharge relationships, as described below.

It should be noted that HEC-HMS rainfall-runoff-routing watershed hydrology model constitutes the first (somewhat exploratory) step in the hydrologic analysis. As discussed in the RDEIR/SDEIS, any releases into Funks Creek would be made through the transition manifold at the base of Golden Gate Dam and a new pipeline that terminates at Funks Creek below the dam. These facilities would carry up to 100 cfs with a release range of 0 to 100 cfs into Funks Creek. Any releases into Stone Corral Creek would be made through the permanent outlet at Sites Dam. This outlet would have a release range of 0 to 100 cfs, with an emergency release capacity of up to 2,500 cfs. The modeling effort would be the first step in determining if a range in flows, as described in the RDEIR/SDEIS, would be needed to meet the purpose of CFGC Section 5937 given the modeled hydrology.

Summary of Field-Based Analysis

The primary objective of the field investigation would be to provide an accurate description of the existing watershed hydrology and variations in streamflow and water surface elevations (i.e., stage) on both Stone Corral Creek and Funks Creek. Periodic streamflow measurements (depth and velocity measurements) would be taken to develop stage-discharge relationships (rating curves) to translate the continuous water depth measurements measured with continuous stage recorders (i.e., HOBO water level loggers [Onset Computer Corporation]) into continuous estimates of flow. These measurements would occur at the hydrologic monitoring locations as shown on Figure 6.

To determine continuous estimates for streamflow, the stage recorders, which measure water temperature and pressure, and vertical stilling wells would be installed in relatively deep portions of the creeks at the locations as shown on Figure 6. The HOBO water level loggers would be set to monitor water depth every 15 or 30 minutes. Additional HOBO water level loggers would also be installed to monitor barometric pressure every 15 or 30 minutes for the purpose of calibrating the depth (water pressure) measurements, which are also affected by barometric pressure. These additional data loggers would be secured to upland surfaces (e.g., trees). Streamflow measurements would be collected to develop equations to convert the continuous stage recorder data into estimated streamflows (discharge). During variable discharge conditions, streamflows would be estimated using a Marsh-McBirney Flo-Mate Model 2000 flow meter and top-setting rod following the procedures described in Module O in Chapter 8 of the SWAMP 2016 SOP (Ode et al. 2016a, 2016b).

Daily precipitation data obtained from the California Data Exchange Center or the PRISM Climate Group would be used to characterize the rainfall patterns during the study period. Rainfall patterns would be displayed concurrently with the measured streamflow data.

If necessary, acoustic Doppler current profiler (ADCP) technology could be used to capture high flow events. ADCP equipment is particularly useful for collecting accurate and precise water depth and 2-D/3-D velocity data, especially at high flows when other standard surveying techniques as described above are impractical or unsafe. ADCP technology also offers the advantage of detecting bed elevation change resulting from high flow events that would be useful for evaluating sediment mobility in the reaches of interest. The applicability of ADCP would be investigated during the first season of hydrologic monitoring (once field conditions at the field site locations are ascertained).

5.3 Timing, Frequency, and Operation Monitoring

5.3.1 Pre-Operations Monitoring

The baseline geomorphic component of the Hydrogeomorphic Study would first be conducted during the winter/spring of 2023. It is anticipated that all relevant geomorphic indicators could be collected during one field trip. Additional baseline geomorphic data collection during subsequent years would be conducted if high precipitation patterns/high flow events occur during the pre-operation period.

The desktop hydrologic component of the Hydrogeomorphic Study would occur during 2023. The field-based hydrologic component of the Hydrogeomorphic Study would occur at the locations as shown on Figure 6 until the dams are constructed.

5.3.2 Operations Monitoring

Follow-up geomorphic and hydrologic surveys would be conducted on a regular (pre-approved) basis for up to 10 years after operations begin. The Authority would consult with the relevant agencies (CDFW, USFWS, and Colusa County) if the frequency of monitoring would be shortened after 5 years. Additional information on each component of is provided below.

Geomorphic Stability Monitoring Plan

Operations geomorphic monitoring would generally be like the pre-operation efforts, including returning to established field site locations and collecting information on geomorphic indicators by performing a geomorphic assessment as described above. Data collected as part of the operations geomorphic monitoring effort would be compared against the baseline data and summarized into interim and final reports to the Authority.

The focus of the operations geomorphic monitoring effort, however, would be geomorphic stability monitoring. As such, the primary survey components of monitoring would include cross section and longitudinal profile surveys, channel bed substrate composition determination, and channel stability evaluations. All methods for these efforts would be identical to those described above. The objectives of these monitoring elements and their relevance to geomorphic stability are summarized below.

Cross Section and Longitudinal Profile Surveys

The objectives of collecting data at the cross sections would be to collect primarily lateral stability information to determine the rate of lateral migration through bank erosion and overall cross-sectional area change. The rate, magnitude, and direction of lateral change and area change would be determined over time using repeat longitudinal profile surveys.

The objective of collecting data at the longitudinal profiles would be to collect primarily vertical stability information to determine rates of aggradation or degradation (whether the stream is downcutting [degrading], filling [aggrading], or remaining static). The rate, magnitude, and direction of vertical change would be determined over time using repeat longitudinal profile surveys.

Channel Bed Substrate Composition and Embeddedness

The objectives of collecting channel bed substrate composition and embeddedness information would be to observe potential shifts in bed material size-frequency distribution, which can be determined over time. Collected grain size information would aid in interpretation in specific geomorphic changes if they occur (such as any changes identified via the cross-sectional and longitudinal profile analyses above).

Channel Stability Evaluations

The chosen methodology for channel stability evaluations would be dictated by site conditions but could include the methods as presented in the modified Pfankuch procedure (Pfankuch 1975) as described by Rosgen (2001), Simon and Down (1995), Bledsoe et al. (2011), or other applicable method. Together with the stream evolution model (Cluer and Thorne 2013), the channel stability analyses would aid in the determination of how Stone Corral Creek and Funks Creek may continue to evolve (e.g., deepen/widen) or remain in a state of equilibrium in the future, thus having implications for the available habitat within the channels.

Hydrologic Monitoring Plan

Operations hydrologic monitoring would be like the pre-operation field-based efforts, including returning to established hydrologic monitoring locations, monitoring stage and stream discharge over time. Data collected as part of the operation hydrologic monitoring effort would be compared against the baseline data and summarized into interim and final reports.

The level of effort of the operations Hydrologic Monitoring Plan, however, would be considerably less than for the pre-operation effort because, depending on the streamflow and precipitation patterns during the pre-operation time-period, there would presumably already be numerous years of pre-operations hydrologic monitoring data at the hydrologic monitoring locations (in other words, a robust data set with multiple discharge measurements and associated stages would be available). The operation hydrologic monitoring effort would, therefore, primarily consist of measuring streamflow values that were not obtained during the pre-operation monitoring effort (presumably higher flow events) and conducting routine field maintenance activities such as periodic downloads of the HOBO water level loggers and upkeep of field equipment.

6.0 Temperature Study Design and Methods

6.1 Overview of Proposed Methods

A temperature study would be conducted to characterize temperatures under existing conditions and determine flow and storage effects on temperature in Stone Corral Creek and Funks Creek under operating conditions. The study would involve evaluating temperatures in the creeks before and after initiation of Project operation and would include consideration of the effects of creek flow and reservoir storage on temperature.

The study would assess the following.

- The temperatures that support the aquatic community under existing conditions.
- Reservoir discharge needed to maintain appropriate temperatures to maintain fish in good condition in Stone Corral Creek and Funks Creek downstream of Sites Reservoir after the start of operation.
- Documentation of hydrologic and flow patterns (as described in Section 5.2.1, *Geomorphic Conditions*)

6.2 Study Design

Once access to Stone Corral Creek is obtained, a temperature probe would be installed in Stone Corral Creek at the location of Sites Dam release, and four additional probes would be installed downstream by approximately 0.5-mile, 1 mile, 2.4 miles (near where Stone Corral Creek goes under Maxwell Sites Road), and 4.4 miles (near where TC Canal goes under Stone Corral Creek).

Once access to Funks Creek is obtained, a temperature probe would be installed in Funks Creek at the location of the I/O tower release to Funks Creek, and two additional probes would be installed downstream by approximately 0.5 mile and 1 mile (far enough upstream of Funks Reservoir to be unaffected by it). In addition, probes would be installed at the TC Canal inlet to Funks Reservoir, at the TC Canal outlet from Funks Reservoir, and at the Funks Creek outlet from Funks Reservoir.

As described in the draft Reservoir Management Plan included in Appendix 2D of the RDEIR/SDEIS, once operation has commenced, water temperature profiles would be measured near Golden Gate Dam once every 2 weeks at 5-feet depth intervals to inform decisions about which ports of the I/O tower to use during March through October. The temperature probes in the creeks would continuously record hourly temperatures. These temperatures would be used along with specific fish requirements to develop target temperature ranges for operation conditions.

Temperatures recorded after Sites Reservoir is operational would be used in conjunction with flow and storage data to determine flow and storage effects on creek temperatures. If creek temperatures cannot be accurately estimated with flow, storage, meteorology, and the reservoir temperature profiles, water temperature modeling could be performed for Sites Reservoir, Stone Corral Creek, and Funks Creek. If modeling is necessary, models would be calibrated with the measured flow, storage, and temperature data.

Water released into Stone Corral Creek would originate from the lower half of Sites Reservoir and would likely be cooler than equilibrium values during months when the reservoir is stratified. The biggest differential between release temperatures and equilibrium values would occur when the reservoir is full and ambient air temperature conditions are high. If it is determined that flow should be maintained in Stone Corral Creek at times when releases would be relatively cool compared to temperatures under existing conditions, lower flows would allow the water to warm farther upstream than higher flows.

Water released to Funks Creek would originate from the I/O tower and, when the reservoir is stratified, would be warmer than the water released to Stone Corral Creek. The temperatures would be warmer because the withdrawals would come from higher in the reservoir and, as described in the Reservoir Management Plan, the I/O tower port openings would be chosen to provide 65 degrees Fahrenheit (°F) or higher water temperatures during the rice growing season (May through September).

6.3 Timing and Frequency

Water temperature measurements would occur before and during operation. Measurements during the initial fill period would be useful for evaluating water temperature under low-storage conditions. Reservoir profile measurements and measurements at the Stone Corral Creek and Funks Creek releases may need to continue in the long term.

Measurements downstream of the release locations could be discontinued if the following conditions are met.

- Sites Reservoir has made releases for at least 2 years when the reservoir was at least 75% full.
- If native fish are found and temperature effects are determined to have little effect on the population(s) (e.g., if only short sections of the creeks below the dams experience temperature effects) or if flow and storage effects on creek temperatures are understood well enough that average daily creek temperatures can be estimated within 3°F based on meteorological conditions, flow, reservoir storage, and reservoir temperature profiles.

7.0 Reporting and Permit Requirements

7.1 Annual Reporting Requirements

Reporting requirements would be met through the preparation and submittal of annual and final reports as part of the Aquatic Study Plan that would be implemented as a part of the Authority's commitments and responsibilities to maintain fish in good condition consistent with CFGC Section 5937.

The first five annual reports would summarize the first 5 years of baseline conditions. All future (operation) reporting efforts would compare the conditions at that time to those collected during the baseline conditions.

The following information would be addressed in comprehensive annual reports with multiple chapters covering fish, bioassessment, hydrogeomorphic, and temperature study results.

- **Fish Study Results.** The annual report would include descriptions and locations of fish communities in Stone Corral Creek and Funks Creek, summarizing monitoring results in the study area. The report would document monitoring results and link results to objectives. The report would identify new or ongoing management issues, threats and stressors, and provide recommendations for future monitoring and management.
- **Bioassessment Results.** The annual reports would include BMI, algae, water quality, and PHAB output and results and a summary of each of these indicators. The most recent version of the SWAMP *Stream Habitat Characterization Form, Full Version* field forms would be provided in appendix format, along with representative photography of the sampling reaches.
- **Hydrogeomorphic Results.** The annual reports would include a summary of the monitoring methods; a summary and analysis of the hydrogeomorphic monitoring results, including an evaluation of site conditions in the context of the performance standards; a discussion of the monitoring results; a discussion of any modifications made to the monitoring methods; a discussion of the previous year's monitoring efforts; and photographs taken from the cross sections and longitudinal profiles.
- **Temperature Results.** The annual reports would include a summary of temperatures that support the aquatic community under existing conditions, and a recommendation of reservoir discharge needed to establish suitable temperatures in Stone Corral Creek downstream of Sites Dam and Funks Creek downstream of Golden Gate Dam after operation has commenced.
- **Monitoring Program Evaluation.** The annual reports would evaluate the Aquatic Study Plan to ensure that data (1) are collected efficiently, (2) address information needs, and (3) adequately assess resource responses to management actions. Changes in monitoring methods, protocols, or frequency would be summarized in the annual reports.
- **Objective Criteria Evaluation.** Annual reports during operations would evaluate whether management actions are meeting project objectives or performance standards (described below). An assessment would be made as to causal factors of observed declines, including the potential role of external stressors outside the parameters of Project effects.
- **Adaptive Management Thresholds.** The link between the technical and decision-making steps requires regular interaction and exchange of information between technical staff and decision-makers. This would be accomplished by annual meetings involving the Authority and the agencies where if necessary, both regulatory and technical expertise can be integrated into revising goals and

objectives, adjusting management and/or monitoring activities, or allocating funding. Meetings should be timed such that any new information discussed assists with the planning of upcoming seasonal work.

7.2 Performance Standards

Performance standards for the Aquatic Study Plan would be based on quantitative metrics. These performance standards would be designed specifically as a means of monitoring the progress and performance of the physical and biological conditions of the study reaches.

Fish community performance standards would include measures of community diversity and percent area occupied for both available and total reach distance within the study areas. BMI performance standards would likely include three main indicators—PHAB IPI scores, BMI CSCI scores, and algae ASCI scores. Geomorphic performance standards would focus on channel stability evaluations such as:(1) evidence of significant and detrimental morphologic changes at any of the cross sections; (2) evidence of channel headcutting; (3) significant loss of gravels via dam impoundment; and (4) significant decrease in the channel stability score during the duration of monitoring activities.

Performance standards would be developed in conjunction with the Authority and the relevant agencies (CDFW, USFWS, and Colusa County) prior to the start of operation monitoring.

7.3 Operations Plan

The Authority would use information from the results of implementation of this Aquatic Study Plan, including field studies described herein, to prepare the Operations Plan. The Operations Plan would describe the approach to address CFGC Section 5937 requirements, if any, resulting from impoundments to storage of flows from Stone Corral Creek and Funks Creek, while also ensuring that the Project's flood protection benefits are realized. Further, the Operations Plan would include, but would not be limited to, the approach for reservoir releases into Stone Corral Creek and Funks Creek, including release schedules and volumes. As stated in the Authority's application to appropriate water, the Operations Plan would be developed in consultation with CDFW, USFWS, and Colusa County, and approved by the Deputy Director for Water Rights.

7.4 Anticipated Schedule

The following schedule is anticipated to result in a reduced workload once a range of flows is encountered with representative variability of environmental conditions (Table 3). For example, the field-based Hydrologic Study could possibly occur over the course of the 5 years leading up to dam construction and could terminate once a suitable range of flows has been measured and analyzed. This could occur within 1 year if flow conditions are variable enough, but more than likely it will occur over a series of years.

Table 3. Anticipated years that each study will be needed to acquire a representative range of environmental conditions for baseline and post operation periods.

Year	Fish Community	Bioassessment Study	Water Quality	Water Temp.	Geomorphic Study	Hydrologic Study (desktop)	Hydrologic Study (field)
Baseline							
2023	√	√	√	√	√	√	√
2024	√		√	√			√
2025	√	√	√	√			√
2026	√		√	√			√
2027	√	√	√	√			√
Post Operation							
2030	√	√	√	√	√		√
2031	√		√	√			
2032	√	√	√	√	√		√
2033	√		√	√			
2034	√	√	√	√	√		√

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Sites Reservoir – Storm Coverage

Media Coverage

- **The Mercury News**
  - Letters: Water to ocean | Sites Reservoir | Healthy waterways | Expel Santos | Unnecessary travel | Standard time
- **The Redlands Daily Facts**
  - Storms tell California to upgrade its plumbing
- **BizPac Review**
  - California sat on authorized and much needed reservoir plan, now massive 'storm flows' head to sea
- **LA Times**
  - California has lots of catching up to do on flood management — with or without climate change
- **ABC 7 KRCR**
  - Assemblyman Gallagher discusses Sites Reservoir, flooding
- **Ag Net West Radio Network**
  - Week in Review: Simultaneous Drought & Flood Emergencies, More Funding for Sites Project
- **POLITICO**
  - Storms force California to look harder at capturing rainfall to ease drought
- **Cal Matters**
  - How California can prepare for future floods before a megastorm hits
- **Cal Matters**
  - Storms tell California to upgrade its plumbing
- **Cal Matters** (brief)
  - California's unhoused in the eye of the storm
- **Ag Net West**
  - Sites Reservoir Receives More Funding as California Experiences Substantial Rainstorms
- **OC Register**
  - What California can learn from wave of storms

The Mercury News

Letters: Water to ocean | Sites Reservoir | Healthy waterways | Expel Santos | Unnecessary travel | Standard time

Ed Kahl Woodside - Letters to the Editor

Sites Reservoir could guard against floods

California needs to build the Sites Reservoir to store flood waters from the Sacramento River. It is needed both for water storage and protection from the types of catastrophic floods that inundated California in 1861 and 1605. The 1861 megaflood was caused by a 45-dayatmospheric atmospheric river.

The Sites off-stream reservoir is the most cost-effective way to protect against such storms. It would store 1.8 million acre-feet of water for 5 million homes and agricultural water needs. Govs. Gavin Newsom and Jerry Brown strongly support the Sites project. While it costs $3.9 billion, it is less expensive per acre-foot than other proposals. Federal funds would be available from recently passed infrastructure bills to reduce the cost. Compared to spending $100 billion on high-speed rail, it's a no-brainer to build the Sites Reservoir.

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The Redlands Daily Facts

Storms tell California to upgrade its plumbing

Dan Walters

The rain and snow storms that have pummeled California for weeks have taken nearly two dozen lives and caused billions of dollars in damages to public and private property.

The flip side, however, is that they dropped immense amounts of water on a state that has suffered through severe drought for several years. At one point this month, an astonishing 160,000 cubic feet of water – 1.2 million gallons – was flowing through the Sacramento-San Joaquin Delta every second. That's enough water to fill a reservoir the size of Folsom Lake, about 1 million acre-feet, in three days and doesn't count water falling on other regions, such as Southern California.

Whether the storms have ended the drought, however, depends on California's ability to capture enough water to fill its badly depleted reservoirs and at least begin to recharge underground aquifers that have been terribly overdrafted by desperate farmers.

So far, only a relatively tiny amount of the immense storm runoff has found its way into storage. For instance, just a trickle of the Delta's heavy flows has been pumped into state and federal aqueducts for delivery to the San Joaquin Valley and Southern California, largely because of rules that that limit diversions to protect endangered species such as the two-inch-long Delta smelt.

This is no time to be dialing back the pumps," state Sen. Melissa Hurtado and Assemblywoman Jasmeet Bains, both Democrats from Bakersfield, told Newsom in a letter last week. "After several years of drought and low reservoir levels, it only makes sense to capitalize on wet conditions."

"We have a moral obligation to provide Californians any relief that is within our control," five Republican congressional members told Biden and Newsom. "Government regulations should not and must not deny our constituents critical water from these storms."

State water officials, however, say their hands are tied by environmental protection rules requiring that initial winter flows be allowed to flush out the Delta and San Francisco Bay.

What's been happening, or not happening, during the weeks-long deluge indicates that California needs some new plumbing to take advantage of the periodic "atmospheric rivers" that bring immense amounts of precipitation.

Meteorologists believe that due to global climate change, the state will experience more erratic weather – prolonged periods of drought interrupted by occasional storm events such as the ones California has been experiencing.

That means we need more storage, such as the Sites Reservoir on the west side of the Sacramento Valley that's been in the planning stage for several decades and sinking basins to recharge aquifers. The long-dormant, $4 billion Sites project now has the ardent support of state and federal officials, as well as some serious money.

The relatively meager diversions from the Delta now allowed by law, meanwhile, bolster the case for the "Delta Conveyance," which would allow more water to be diverted into the state and federal aqueducts, and thus into downstate reservoirs, without running afoul of environmental restrictions. The project has kicked around for six decades, first as a "peripheral canal," later as twin tunnels dubbed "Water Fix," and now a single tunnel.

California water managers will have another chance to fill reservoirs in a few months, when the immense Sierra snowpack that's twice the historic average and still growing melts. We can only hope that Mother Nature releases the snowpack's water slowly enough to avoid destructive floods.

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BizPac Review

California sat on authorized and much needed reservoir plan, now massive 'storm flows' head to sea

Melissa Fine

In the state of California, water is often a topic of conversation. The Beverly Hills elites need boatloads of it to fill their swimming pools, and the farmers who provide the nation with everything from avocados to Angus beef need it to keep the food coming.

It seems the Golden State always has either way too much of the wet stuff or not nearly enough.
So, in 2014, amid one of the driest spells in California's recorded history, residents voted to approve the Water Quality, Supply, and Infrastructure Improvement Act, also known as Proposition One, which authorized "$7.545 billion in general obligation bonds to fund ecosystems and watershed protection and restoration, water supply infrastructure projects, including surface and groundwater storage, and drinking water protection."
Nearly a decade later, as the state is drowning under a parade of atmospheric rivers and cyclone bombs, voters are watching trillions of gallons of water run out to sea and wondering what happened to all those promised reservoirs.

According to the San Francisco Chronicle, "none of the major storage projects, which include new and expanded reservoirs, has gotten off the ground."

"As the state experiences a historic bout of rain and snow this winter, amid another severe water shortage, critics are lamenting the missed opportunity to capture more of the extraordinary runoff that has been swelling rivers, flooding towns and pouring into the sea," the Chronicle reports.

"The seven dedicated storage projects funded by voter-approved Proposition 1 remain in various stages of planning," the outlet continues. "Many are big ventures, including the proposed Sites Reservoir in the

Sacramento Valley that would be California's eighth largest reservoir. Such efforts require years of design, permitting and fundraising and are not easy to build. Still, some say progress has been too slow given the dire need for water."

On January 11, the California Republican congressional delegation, led by Rep. David G. Valadao (CA – 22), penned a letter to California Governor Gavin Newsom and President Joe Biden, urging them to "prioritize and expedite water storage projects that would help the state be better prepared for future storm events."
"The past few years of catastrophic man-made drought have crushed California families and farms, and with supply chain disruptions further hamstringing our agricultural producers, we have a moral obligation to provide Californians any relief that is within our control," the lawmakers wrote. "Government regulations should not and must not deny our constituents critical water from these storms. While we cannot make it rain, we must take advantage of opportunities to store water when it does and maximize what can be moved at all times through the Delta for the duration of these storms."

"We urge your administrations to direct relevant federal and state agencies to waive all impediments that limit operations of the Delta pumps to ensure none of these storm flows go to waste," they stated. "Time is of the essence."

According to the Chronicle: "Gov. Gavin Newsom has weighed in, too, pledging to expedite the construction of new storage facilities by providing additional funding and removing 'permitting barriers,' not unlike his predecessor Jerry Brown who similarly tried to accelerate the work."

And even as soaked Californians attempt to navigate through flooded streets, as Politico noted on Monday, "the drought is not yet over."

"To many, the storms highlight the need for changes to the vast system to capture rain and snow in the wetter northern part of the state and transfer it to the farms of the Central Valley and the cities of Southern California," Politico reported. "Much of the recent runoff has ended in the sea, even as forecasters warn that the drought is not yet over."

"The state already has plans to start construction on a new reservoir near Sacramento next year," the outlet wrote, "and to increase pumping in the Sacramento-San Joaquin region through the Delta Conveyance project."

Newsom, it reported, is turning to the Biden administration's massive spending packages for relief.
"The governor suggested federal funding from the Inflation Reduction Act and the Bipartisan Infrastructure Law could help fund water supply and flood risk reduction projects," Politico stated. "He also called for a climate

bond to fund water and wildfire projects. A 2014 bond approved by voters was meant to help fund new reservoirs and other water projects, though opposition from local conservation groups has delayed construction."

"Megadroughts. Wildfires. Historic floods and atmospheric rivers," Newsom tweeted on Jan. 10. "This whiplash weather is not an anomaly. California is proof that the climate crisis is real and we have to take it seriously."

But, as the San Francisco Chronicle reported on Jan. 11, flooding of this magnitude is nothing new in California, making it even more maddening that nothing has been done to capture the rainfall.

"The Great Flood of 1862, seemingly lost in time, is the answer to the question: What was the most destructive flood in California history?" it stated.

"Entire towns were destroyed, and farmland and plains turned into lakes as far as the eye could see," the Chronicle continued. "Almost everyone in the state was impacted by the flood, from victims who lost their homes to state employees who, in the chaos and confusion, didn't get paid for more than a year."

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LA Times

California has lots of catching up to do on flood management — with or without climate change

George Skelton

SACRAMENTO — When Leland Stanford became California's governor in 1862, he needed a rowboat to carry him to the Capitol to be sworn in.

Sacramento's streets were flooded. In fact, much of California was. A 300-mile-long lake was created in the Central Valley from near Bakersfield to Red Bluff. At least 4,000 people were killed.

It was the largest flood in the recorded history of California, Nevada and Oregon, dumping 10 feet of water on this state over a 43-day period.

The Great Flood of 1862 followed a 20-year drought. And it occurred half a century before gasoline-burning automobiles began spewing greenhouse gases into the atmosphere, exacerbating human-caused global warming.

Gov. Gavin Newsom seems, in every other sentence, to blame the intensity of our current storms — or any drought or wildfire — on climate change. We're getting drier and wetter, and the cycles are becoming more frequent, he and experts warn.

OK, I'm no climatologist. But I do read history. And you can acknowledge history without being a climate denier. Burning fossil fuel has warmed the planet and appears to have mucked up our climate. But we'd still suffer terrible droughts and disastrous storms even if all the energy we used was carbon free.

Cycles of drought and flooding have been the California way — nature's way — for eons. There were many droughts and megafloods in California prior to the industrial revolution — before we packed nearly 40 million people into the state, making these events even more disastrous to humans.

And, of course, there were several catastrophic floods in the last century before global warming became acute. Times columnist Gustavo Arellano recently wrote about the Great Flood of 1938.

"What Southern California has weathered so far this January has been bad but nowhere near as destructive as 1938," he reminded. All the basin's major rivers overflowed their banks. At least 87 people were killed.
At Christmastime in 1955, floods inundated much of Northern California, killing more than 60 people. At least 42 died around Yuba City and Marysville when the Feather River burst its banks.

"California has lots of extremes. We've always had more wet years and drier years than any part of the country," Jay Lund, vice director of the UC Davis Center for Watershed Sciences, once told me. "Every year we're managing for drought and for floods, and we always will."

Yes, and we've got lots of catching up to do on flood management with or without climate change.
The 1955 flooding motivated just enough Northern California legislators and voters eager for flood control to approve new Gov. Pat Brown's then-controversial California Water Project in 1960. It included the huge Oroville Dam on the Feather River.

But the state has added little to its once-prized water system since then. Meanwhile, the population has more than doubled.

One failure is we're not capturing and storing nearly as much floodwater as we should. The primary example is in the Sacramento-San Joaquin River Delta, the source of drinking water for 27 million Californians and irrigation for 3 million acres.

Ideally, we'd be grabbing big pools of nature's gift and storing it for use in dry years. Instead, it escapes through San Francisco Bay and flows into the ocean.

One immediate reason we're capturing less water than we could is a regulation agreed to by the former Trump administration.

Under it, the "first flush" of each season's major storm is reserved for the bay. For two weeks, state and federal pumps at the southern end of the delta have been permitted to pump at only about half capacity.

The main reason is to protect endangered fish. Aggressive pumping reverses San Joaquin River flow, sucking endangered tiny smelt and little salmon into the pumps or mouths of large predator fish. But fish aside, the reverse flows draw in salt water from the bay. And that gets pumped south into Southern California reservoirs. "That's why we're so focused on the delta tunnel. It's going to allow us to pump large amounts of water during big winter storms without an environmental impact," says Wade Crowfoot, secretary of the state Natural Resources Agency.

Fresher Sacramento River water from the north delta would be siphoned into a 45-mile-long, 39-foot-wide tunnel ending near the southbound aqueducts. If it had been in place, Crowfoot estimates that an additional 131,000 acre-feet of floodwater could have been captured during the current storm as of late last week. But small delta communities, local farmers and environmentalists worry that if the tunnel existed, water grabbers — meaning San Joaquin agriculture and L.A. — wouldn't just be taking stormwater. They'd also be seizing water during dry summers and droughts, leaving the delta saltier.

All that must be negotiated and litigated. If it's ever built, the $16-billion project probably couldn't be operational until at least 2040.

There also needs to be more storage room for floodwater. There's a perpetual cry for additional costly dams. But we're already dammed to the brim. There are nearly 1,500 dams in California. Practically every good site has been used.

But one sensible dam project is noncontroversial and headed for construction. It's Sites in Colusa County, an off-stream reservoir that would hold 1.5 million acre-feet of water siphoned off the nearby Sacramento River. Construction on the $4.5-billion project could begin in 2025.

Some existing dams, including San Luis in Merced County and Los Vaqueros in Contra Costa County, probably will be expanded.

But the future of storage is underground in depleted aquifers. That's a major focus of state and local governments.

Meanwhile, even with climate change, Newsom didn't need to row a skiff to his recent second inauguration at the Capitol. He was driven to the outdoor ceremony in a big SUV as storm clouds briefly parted.

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Abc7 KRCR

Assemblyman Gallagher discusses Sites Reservoir, flooding

Preston Donion

REDDING, Calif. — With continued valley rain and mountain snow, concerns over how to retain that water have risen once again.

One project that, if completed, could add 1.5-million-acre feet in water storage capacity is the proposed Sites Reservoir in Glenn and Colusa counties. Assemblyman James Gallagher explained the reservoir has bipartisan support, but still faces bureaucratic hurdles on the road to construction, describing what's been done and where the project stands.

"One thing people should know is that we've done a lot of work to move sites forward. You know, I passed legislation in my first term that would help make that project more cost effective when it comes to construction and moving that forward. We successfully advocated with the Water Commission to allocate almost a billion dollars of funding to Sites Reservoir. And then, the federal government came to, you know, Congressman LaMalfa also worked really hard to get federal financing that helps with the funding of that project as well. The big hold up—I mean, the money's there, you know, we've advocated very successfully. The big hold up is under the governor's purview. It's the executive agencies that permit the project, so the State Department of Fish and Wildlife, the Water Resources Control Board, they have yet to issue permits, and they've been going back and forth. There's been studies after studies, analysis, all kinds of environmental review for years now, you know, it's been years since the Water Commission allocated the money. And so, that's where it's the bureaucratic hold up. That's where it is. It's stuck in the bureaucracy, and we need to move this project forward. We should already be building it right now," Gallagher told KRCR's Preston Donion on Friday.

Despite the challenges and the perpetually extended timeline, Assemblyman Gallagher expressed that the project remains important and that work will continue in 2023 to make the reservoir a reality.

"The governor said that he supports the project, and so we stand ready to. We're just saying, look, let's get going, you know, let's get going. We stand ready to work with you in any way possible, but we need to get this project off the ground. It's been far too long, and so it's a frustration because now we see these storm waters, you know, going down the river, we could be utilizing and capturing those storm flows better and it's just it's time to get it done," Gallagher said.

Gallagher also mentioned the importance of improving flood control infrastructure, and emphasized that as a goal in 2023, saying, "We've had localized flooding. We haven't had any levee breaks, you know, fortunately, but we need to continue to invest in our levees and make sure we're protecting our communities. A lot of that work. There has been a lot of positive work done on that front, but it's been mostly in urban areas and so we need to get out and start doing more work in the rural areas to strengthen our levees to make sure our flood control systems are strong enough to withstand these storms."

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Ag Net West Radio Network

Week in Review: Simultaneous Drought & Flood Emergencies, More Funding for Sites Project

Even as California receives massive amounts of rainfall, rural communities are still experiencing drought impacts. The Sites Reservoir Project has recently received an additional $80 million through the Water Infrastructure Improvements for the Nation Act. Ranch manager for Marthedal Enterprises, Austin Hubbell sees ag partnerships as being crucial to the progression of the raisin industry in allowing growers to take initiative and help find solutions to production challenges. John Deere has signed a memorandum of understanding with the American Farm Bureau Federation that addresses the right to repair equipment.

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POLITICO

Storms force California to look harder at capturing rainfall to ease drought

Camille Von Kaenel

SACRAMENTO, Calif. — After the driest three years in the state's modern history, California suddenly has a different problem on its hands: too much water.

An ongoing series of storms drenching the state has forced officials to take measures unfathomable just a month ago, like releasing excess water from reservoirs and pumping surging river flows into storage.

It's also renewing interest in how to better capture rainfall for dry times — an idea long popular in agricultural areas, particularly among Republicans, and now increasingly embraced by Gov. Gavin Newsom and other Democrats.

"As you can see outside with some of the floods, it's not that we don't have water, it's what are we doing with it when we get it," Assemblymember Devon Mathis (R-Visalia) said in an interview.

To many, the storms highlight the need for changes to the vast system to capture rain and snow in the wetter northern part of the state and transfer it to the farms of the Central Valley and the cities of Southern California.

Much of the recent runoff has ended in the sea, even as forecasters warn that the drought is not yet over.

The weather whiplash is not new to California, but climate change is expected to super-charge these extremes. The state already has plans to start construction on a new reservoir near Sacramento next year, and to increase pumping in the Sacramento-San Joaquin region through the Delta Conveyance project.

Mathis and others see this moment as an opening to boost water storage — but they will have to overcome a big price tag, the lack of obvious solutions like big dams, and entrenched polarization around the West's most precious resource. The Republican lawmaker is proposing a law requiring more storage capacity for water, a goal endorsed by Newsom.

Newsom also called for speeding up permitting for new water storage and flood reduction projects, a measure Mathis is now leading in the Assembly. A Democrat is leading a similar measure in the Senate. The proposals risk further conflict over efforts to protect habitat for salmon and other species.

Democratic state lawmakers from farming regions hit hardest by drought also jumped on the opportunity last week to urge officials to divert and store more water rushing through the Delta region to the ocean before the storms end. But laws protecting an endangered species of fish limit the pumping.

The pumps, aqueducts and reservoirs California relies on are "outdated and vulnerable to climate change" and limit the amount of water that can be stored during winter storms, acknowledged the director of the Department of Water Resources, Karla Nemeth.

The limits of large-scale projects have prompted officials to look for alternative ways to boost water supply, like funding more floodplain restoration and allowing certain water managers to more easily divert rivers and rain into underground basins. Los Angeles County is working to build hundreds of small wells and cisterns to grab as much river water as possible.

Two reservoirs have already started using real-time forecasts to take better advantage of California's winter storms. A Democrat wants to expand that technology this year with a proposal in the Assembly.

But it will take years of rain and careful conservation to replenish depleted groundwater supplies after a longstanding drought, said Jeffrey Mount, a senior fellow at the Public Policy Institute of California, a research organization.

"We're at the beginning of an era here in California where we're realizing that we really have to do a better job of taking advantage of these wet periods," he said. "But it's thoroughly disorganized at this point."

Newsom previewed the challenge in his budget proposal last week, calling for an additional $200 million for flood protection. His plan avoided large cuts in drought funding despite a revenue shortfall.

The governor suggested federal funding from the Inflation Reduction Act and the Bipartisan Infrastructure Law could help fund water supply and flood risk reduction projects. He also called for a climate bond to fund water and wildfire projects. A 2014 bond approved by voters was meant to help fund new reservoirs and other water projects, though opposition from local conservation groups has delayed construction.

Dressed casually, instead of his usual suit, the governor then cut his budget presentation short so he could get to the Central Coast and survey storm damage.

"Immediate drought support, 40 days ago, was top of mind," Newsom said. "Right now, what's top of mind is flood investments."

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CalMatters

How California can prepare for future floods before a megastorm hits

Guest Commentary

Californians have suddenly turned their attention from drought to flooding.

The future likelihood of a series of huge atmospheric rivers in California, a so-called ARk storm scenario, seems to be a certainty. Atmospheric rivers channel moist tropical air towards the West Coast, where mountains condense it to rain and snow. Over the last few weeks, California has suffered through a sneak peak of its devastating potential.

In late December of 1861, weeks of snow and rain from a huge ARk storm caused flooding from Oregon and Idaho to Mexico. The new settlers did not listen to the Indigenous peoples of California who knew that winter meant moving away from the river.

State government had to be temporarily relocated from Sacramento to San Francisco. The California Supreme Court made the move permanently. The Central Valley became an inland sea, and flooding was severe in Southern California. One percent of the state's population died.

These megastorms occur about once every 150 years. Climate change will intensify them.
Flood control reservoirs already line the Sierra Nevada foothills, including Shasta, Oroville, Folsom, New Melones and others. Some reservoir space is emptied each fall to make way for potential oncoming floods, reducing the value of the reservoir for hydroelectric generation, water supply, recreation and cold water storage for fish. Reservoir operators can minimize (but not eliminate) dumping valuable water if no major storm is predicted.

But Sierra Nevada and similar Southern California flood control reservoirs like Prado and Seven Oaks cannot store enough floodwater to sufficiently reduce the effects of atmospheric river megastorms. The reservoirs will fill, but continuous flood flows will pass through as if the reservoirs were not there.
Gigantic new flood control reservoirs could theoretically be built. But the costs would be in the tens of billions of dollars, and the reservoirs would serve little purpose for decades since they would have to be emptied at the start of each flood season. It's unlikely that the Legislature or Congress would invest in such a flood control system.

Indeed, at least $3 billion in levees and floodwater bypasses are needed just to prevent major flood damage in the Central Valley from storms that are expected to occur much more often than megastorms.

Can flood waters be diverted into "off-stream" storage reservoirs for later use? Not really. The proposed giant Sites Reservoir could divert only a small percentage of the water expected in the Sacramento River in even moderate flood events. The value of such reservoirs is largely in their water supply benefits.
Still, much can be done to prepare.

First, California needs to increase investment in flood plain acquisition and expansion and prevent the urbanization of flood-prone areas. Staying out of harm's way is the best idea.

Flood water bypasses help protect the Sacramento Valley and can recharge groundwater. The San Joaquin Valley urgently needs a similar system. It's likely too late to build them in highly urbanized parts of Southern California.
Second, property owners who are at risk only from a megaflood should be encouraged to purchase flood insurance. For property outside the "100 year" flood zone, it would be a small annual investment to cover the damage that is bound to occur.

Third, locally managed evacuation drills should be held in areas where the flood risk is highest, such as Sacramento and areas near the Los Angeles and Santa Ana Rivers. A megastorm will require evacuation of millions of people in the Central Valley and parts of the Bay Area and Southern California. The public needs to be prepared.

Californians have spent billions of dollars to prepare for earthquakes and catastrophic wildfires. Recent quakes and fires are often on our mind, and leaders are reacting appropriately.

But Californians have largely forgotten the death tolls and huge property losses of previous deadly floods, and even larger floods are likely to come. They will affect all Californians, and require greater investment in flood preparation, insurance and evacuation planning.

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CalMatters

Storms tell California to upgrade its plumbing

Dan Walters

The rain and snow storms that have pummeled California for weeks have taken nearly two dozen lives and caused billions of dollars in damages to public and private property.

The flip side, however, is that they dropped immense amounts of water on a state that has suffered through severe drought for several years. At one point this month, an astonishing 160,000 cubic feet of water – 1.2 million gallons – was flowing through the Sacramento-San Joaquin Delta every second. That's enough water to fill a reservoir the size of Folsom Lake, about 1 million acre-feet, in three days and doesn't count water falling on other regions, such as Southern California.

Whether the storms have ended the drought, however, depends on California's ability to capture enough water to fill its badly depleted reservoirs and at least begin to recharge underground aquifers that have been terribly overdrafted by desperate farmers.

So far, only a relatively tiny amount of the immense storm runoff has found its way into storage. For instance, just a trickle of the Delta's heavy flows has been pumped into state and federal aqueducts for delivery to the San Joaquin Valley and Southern California, largely because of rules that limit diversions to protect endangered species such as the two-inch-long Delta smelt.

San Joaquin Valley legislators have beseeched President Joe Biden and Gov. Gavin Newsom to relax the rules so that more runoff can be either delivered to farmers or placed in storage, such as the San Luis Reservoir, which is now less than half-full.

"This is no time to be dialing back the pumps," state Sen. Melissa Hurtado and Assemblywoman Jasmeet Bains, both Democrats from Bakersfield, told Newsom in a letter last week. "After several years of drought and low reservoir levels, it only makes sense to capitalize on wet conditions"

"We have a moral obligation to provide Californians any relief that is within our control," five Republican congressional members told Biden and Newsom. "Government regulations should not and must not deny our constituents critical water from these storms."

State water officials, however, say their hands are tied by environmental protection rules requiring that initial winter flows be allowed to flush out the Delta and San Francisco Bay.

What's been happening, or not happening, during the weeks-long deluge indicates that California needs some new plumbing to take advantage of the periodic "atmospheric rivers" that bring immense amounts of precipitation.

Meteorologists believe that due to global climate change, the state will experience more erratic weather – prolonged periods of drought interrupted by occasional storm events such as the ones California has been experiencing.

That means we need more storage, such as the Sites Reservoir on the west side of the Sacramento Valley that's been in the planning stage for several decades and sinking basins to recharge aquifers. The long-dormant, $4 billion Sites project now has the ardent support of state and federal officials, as well as some serious money.

The relatively meager diversions from the Delta now allowed by law, meanwhile, bolster the case for the "Delta Conveyance," which would allow more water to be diverted into the state and federal aqueducts, and thus into downstate reservoirs, without running afoul of environmental restrictions. The project has kicked around for six decades, first as a "peripheral canal," later as twin tunnels dubbed "Water Fix," and now a single tunnel. California water managers will have another chance to fill reservoirs in a few months, when the immense Sierra snowpack that's twice the historic average and still growing melts. We can only hope that Mother Nature releases the snowpack's water slowly enough to avoid destructive floods.

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CalMatters

California's unhoused in the eye of the storm

Sameea Kamal

Meanwhile, Gov. Gavin Newsom's request to the federal government for an emergency declaration was approved late Sunday. Newsom has proposed $202 million in his budget proposal to ramp up flood protection. He plans to unveil the rest of his proposal this morning, after which he's scheduled to survey the state's response to the storms. "Our message to Californians is simple: Be hyper-vigilant," he said in a statement.

In their budget priorities, Senate Republicans called Monday for more money for water storage:

- "The current wave of storms highlights the importance of building the Sites Reservoir and providing water conveyance in critical areas of the state. This will provide water storage for 1.5 million homes per year and promote much-needed water access for California's food producers."

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Ag Net West

Sites Reservoir Receives More Funding as California Experiences Substantial Rainstorms

Brian German

The Sites Reservoir project has received additional funding support from the Bureau of Reclamation. Last week, the project received $80 million through the Water Infrastructure Improvements for the Nation Act (WIIN

Act). The announcement comes after an additional award of $30 million was provided to the project through the Infrastructure Investment and Jobs Act.

"Thanks to the continued support of our federal elected officials and Commissioner Touton, we are maintaining momentum on Sites Reservoir and advancing critical project milestones," Sites Project Authority Chairman Fritz Durst said in a news release. "Sites will help ensure California has a reliable water supply in the face of prolonged drought uncertainty."

The reservoir project will increase water storage capacity in the state by 1.5 million acre-feet by capturing excess stormwater from the Sacramento River. Sites Project Authority has also been invited to apply for a $2.2 billion low-interest loan through the Environmental Protection Agency's Water Infrastructure Finance and Innovation Act. The entire project is estimated to cost about $5.2 billion.

The funding announcement comes as California experiences a series of significant storm systems. Flooding in areas of the state has once again sparked public discussion as to how California can better manage water. "It's time we manage water differently in California. More of the same will not provide relief from severe drought—but Sites Reservoir is a new source of drought year water that will provide tangible benefits to California's environment, people and farms," Durst noted.

Through the last month of rain events, water supplies in some of the state's largest reservoirs have increased by an average of approximately 10 percent of their holding capacity. The snowpack in the state has already greatly improved since the beginning of last month. According to the California Department of Water Resources, the statewide snowpack is at 76 percent of the April 1 average.

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OC Register

What California can learn from wave of storms

Dan Walters

California, particularly Northern California, was walloped by a major winter rain and snow storm last week and meteorologists expect that high levels of precipitation will continue for at least another week.
Despite some damage and at least one death from local flooding and tree-toppling high winds, the storm and the predictions of more to come are welcome relief from what had appeared to be a prolonged drought.
There are lessons to be learned from this watery wave, if Californians and the politicians they have elected pay attention, to wit:

— Despite great advances in technology and data collection, weather forecasting is still an imperfect science. Until the storm hit, meteorologists had expected that a phenomenon known as La Niña would continue to block Pacific fronts from reaching the state and thus continue the drought.

That said, there's no guarantee that the 2022-23 season will be a wet one. A year ago we had a similar spurt of precipitation, but it did not continue into the spring.

— Erratic precipitation makes it very difficult for reservoir managers to decide how much water to release and how much to retain for future use. For example, Folsom Lake near Sacramento was scarcely a third full when the storm hit, but the Bureau of Reclamation tripled releases to 24,000 cubic feet a second, worried about the reservoir's ability to absorb runoff in the American River's Sierra watershed.

— Folsom's increased releases are another indication that California lacks enough water storage to cope with precipitation cycles that are becoming less predictable due to climate change. If we had built the additional storage that water managers had long proposed – Auburn Dam upstream from Folsom, for example – it would have meant less guesswork when opportunities arose to capture water from heavy storms.
Preliminary construction had begun on Auburn Dam when, during the 1970s, it was abruptly halted. Other storage projects have been on the drawing board for decades, such as Sites Reservoir on the west side of the Sacramento Valley. Were Sites a reality today, it would be absorbing excess flow from the Sacramento River, banking water for when it would be needed in the future.

The "atmospheric river" now watering California underscores the state's vulnerability to catastrophic flooding.

Last year, a massive study was released, suggesting that climate change creates an and an ever-increasing risk of mega floods that would cause untold death and destruction.

It is the latest update to studies that originated from the historic flooding that struck California during the winter of 1861-62, when California had been a state for scarcely a decade.

As the study noted: "This event, which was characterized by weeks-long sequences of winter storms, produced widespread catastrophic flooding across virtually all of California's lowlands – transforming the interior Sacramento and San Joaquin valleys into a temporary but vast inland sea nearly 300 miles in length and inundating much of the now densely populated coastal plain in present-day Los Angeles and Orange counties."

If such a prolonged deluge occurred again, researchers Xingying Huang and Daniel Swain, wrote, it “would likely produce widespread, catastrophic flooding and subsequently lead to the displacement of millions of people, the long-term closure of critical transportation corridors and ultimately to nearly $1 trillion in overall economic losses.” Again, the American River’s situation illustrates the threat. Officials say that Folsom Lake’s capacity, nearly one million acre-feet, is too small to protect Sacramento from such a disaster. One rationale for Auburn Dam had been to provide another layer of flood protection.

Will politicians heed the lessons from the current period of prolonged precipitation or continue disengaged business as usual?

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Note to Media: If you are interested in interviewing a representative from Sites Project Authority on this topic, please contact Ann Newton at anewton@katzandassociates.com or (310) 774-7639 to schedule an interview with the Authority's executive director, Jerry Brown.

For Immediate Release: Contact: Ann Newton
January 18, 2023 (310) 774-7639

New Analysis Reveals Recent Storms Would Have Yielded Water for Up to 2 Million People, Farms, and Businesses if Sites Reservoir Were Operational Today

Sacramento, CA - The Sites Project Authority today announced findings from a new analysis that projected Sites Reservoir could have diverted and captured 120,000 acre-feet of water in just two weeks if the reservoir had been operational from Jan. 3 through Jan. 15. Based on forecasted flows, the analysis shows that the reservoir would continue to capture water over the next few weeks as flows continue to run high.

"This is exactly the type of scenario that Sites is being built for—short windows of extremely high flows. There is an untapped opportunity to capture and store a portion of the significant amount of flow from the Sacramento River that occurs during these rare but major storms without impacting the value of these high flows for our environment," said Jerry Brown, Executive Director of the Sites Project Authority.

Sites Reservoir is specifically designed to divert and store water generated by storm events, like the atmospheric rivers that drenched the state in recent weeks, to increase water flexibility, reliability, and resiliency in drier years.

The analysis found Sites Reservoir could have diverted 120,000 acre-feet of water—less than 4% of Delta outflow—from Jan. 3 to Jan. 15. Long-range forecasts estimated that Sites Reservoir would continue to divert stormwater through at least Feb. 15, for a total 382,000 acre-feet of water. A single acre-foot of water is enough to exceed the average annual indoor and outdoor water use of one to two California households, according to the Water Education Foundation.

"The rainstorms that pummeled Northern California would have been Sites' time to shine," said Alicia Forsythe, Environmental Planning and Permitting Manager of the Sites Project Authority. "It would have captured a portion of the flood waters for use in future dry times by farms, families, and ecosystems, while leaving lots of water in the Sacramento River and Delta for our environment and fisheries."

While Sacramento River flows started increasing in late December, the Project would have implemented its 7-day pulse flow protection criteria and not started diverting until January 3. The pulse flow protection criteria protects these initial high flow events as they provide value for outmigrating salmon and our river ecosystems.

Periods of heavy rainfall are ideal opportunities to divert and capture water that accumulates quickly but is often lost to flooding and rapid runoff. Sites will not divert any water until all other water rights and regulatory requirements are met. The analysis shows that during these major storms, all these other needs can be met, and Sites would still be able to store excess water while meeting the project's protective diversion criteria.

Sites Reservoir is an off-stream reservoir that will capture and store a portion of stormwater from the Sacramento River and release water to California communities, farms, business, and wildlife during drier years. Sites Reservoir has broad statewide support from cities, counties, water agencies, and irrigation districts throughout the Sacramento Valley, San Joaquin Valley, Bay Area, and Southern California which are working together to advance the project. The Sites Reservoir Project is locally led by the Sites Project Authority which is made up Sacramento Valley water districts, cities, and counties.

Sites is an off-stream reservoir proposed north of the Sacramento-San Joaquin Delta, where it would provide unique water supply and environmental benefits during dry periods, especially during extended drought. Additional information can be found at sitesproject.org or on Facebook and Twitter at @SitesProject.

From: Alicia Forsythe [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=A6CDF06A7E904B65BAA21702A82AD329-AFORSYTHE]
Sent: 1/19/2023 12:29:46 PM
To: Ann Newton [anewton@katzandassociates.com]
CC: Jerry Brown [jbrown@sitesproject.org]; Kevin Spesert [kspesert@sitesproject.org]; Sara M. Katz [skatz@katzandassociates.com]; Quin La Capra [qlacapra@katzandassociates.com]; Sarah Rossetto [srossetto@katzandassociates.com]
Subject: RE: Sites Storm Diversion Materials for Approval
Attachments: Recent Storms Make the Case for Sites_Blog_Ali.docx

Hi all – Apologies for taking so long on this, but I wasn't jazzed with the blog. I just felt like it said the same thing as the tweets and the press release. I felt like we should expand or take a little different approach in the blog to continue to build on the messaging.

Attached are some suggestions and thoughts for folks to consider. Maybe this goes too far, but thought I'd throw it out there.

I am leaving for maxwell and will be on the road for the next 1.5 hours.

Ali

Alicia Forsythe | Environmental Planning and Permitting Manager | Sites Project Authority | 916.880.0676 | aforsythe@sitesproject.org | www.SitesProject.org

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From: Ann Newton <anewton@katzandassociates.com>
Sent: Wednesday, January 18, 2023 12:17 PM
To: Alicia Forsythe <aforsythe@sitesproject.org>
Cc: Jerry Brown <jbrown@sitesproject.org>; Kevin Spesert <kspesert@sitesproject.org>; Sara M. Katz <skatz@katzandassociates.com>; Quin La Capra <qlacapra@katzandassociates.com>; Sarah Rossetto <srossetto@katzandassociates.com>
Subject: Re: Sites Storm Diversion Materials for Approval

Thanks all! We will change 3 million to 2 million across all materials and then distribute the press release and social. Holding on the blog until we receive further edits from Ali.

Sent from my iPhone

On Jan 18, 2023, at 12:09 PM, Alicia Forsythe <aforsythe@sitesproject.org> wrote:

Hi all – I think the press release and tweets are ready. I think there might be a little work on the blog. I can work on some mark-ups now.

Ali

Alicia Forsythe | Environmental Planning and Permitting Manager | Sites Project Authority | 916.880.0676 | aforsythe@sitesproject.org | www.SitesProject.org

From: Ann Newton <anewton@katzandassociates.com>
Sent: Wednesday, January 18, 2023 12:03 PM
To: Jerry Brown <jbrown@sitesproject.org>; Alicia Forsythe <aforsythe@sitesproject.org>; Kevin Spesert <kspesert@sitesproject.org>
Cc: Sara M. Katz <skatz@katzandassociates.com>; Quin La Capra <qlacapra@katzandassociates.com>; Sarah Rossetto <srossetto@katzandassociates.com>
Subject: RE: Sites Storm Diversion Materials for Approval

Thanks, Jerry. I was just working up a separate email to suggest a more conservative estimate as well. I had been thinking 4 people per household, but that's not accurate. We will say 2 million. Of course in reality, the water would also go to farms, the environment and businesses, but we just wanted to illustrate an example of how much water this could mean for California.

<image001.png>

From: Jerry Brown <jbrown@sitesproject.org>
Sent: Wednesday, January 18, 2023 11:59 AM
To: Ann Newton <anewton@katzandassociates.com>; Alicia Forsythe <aforsythe@sitesproject.org>; Kevin Spesert <kspesert@sitesproject.org>
Cc: Sara M. Katz <skatz@katzandassociates.com>; Quin La Capra <qlacapra@katzandassociates.com>; Sarah Rossetto <srossetto@katzandassociates.com>
Subject: Re: Sites Storm Diversion Materials for Approval
Importance: Low

All looks good. On the amount of water question and % of outflow:

General rules of thumb is 2 houses use 1 acre foot over the course of a year. So 382,000 AF * 2 = 764,000 homes served for one year. Also general rule of thumb is 2.5 people per home. So 764,000 homes * 2.5 people per home = 1,910,000. So say 2 million people, not 3.

Ali doing one final check on % of outflow calc with MBK.

From: Ann Newton <anewton@katzandassociates.com>
Date: Wednesday, January 18, 2023 at 11:36 AM
To: Jerry Brown <jbrown@sitesproject.org>, Alicia Forsythe <aforsythe@sitesproject.org>, Kevin Spesert <kspesert@sitesproject.org>
Cc: "Sara M. Katz" <skatz@katzandassociates.com>, Quin La Capra <qlacapra@katzandassociates.com>, Sarah

Rossetto <srossetto@katzandassociates.com>
Subject: Sites Storm Diversion Materials for Approval

Jerry, Ali and Kevin,

Attached please find three documents for your final review and approval:

1. Press Release
2. Social Media Posts
3. Blog (to be signed by either Jerry or Ali, whoever is preferred)

Couple of quick notes.

4. The press release and social media reflect Ali's edits and the final Tweets she sent us this morning.
5. We would like you to confirm that you are comfortable with how we've quantified the amount of water in the headline. See comment embedded in the release.
6. Priority is social media and press release. If we need more time on the blog, we can post it later this week.

We will await your edits and then do a final QA/QC and distribute through channels only after we get approval. Thanks all!

Ann

<image002.png>

Reservoir Committee and Authority Board Meeting

Agenda Item 3.1: Converting to Storage Allocation-Based Participation

January 20, 2023

Sites

Objective

- Transition to Storage Allocation based participation starting with Phase 3/Phase 4
  - RC and AB approved methodology for allocating storage space to local Storage Partners in April 2021
  - State and Federal participation is more certain now
  - Timing is appropriate prior to soft call mid-2023
- Discussion today is for questions and initial feedback

Storage Allocation Methodology

- Approved April 16, 2021
- Established equitable treatment between local Partners, without disproportionate benefits to State and Reclamation
- Preliminary outcome equation:

  Existing participation x 6.234 = Storage Allocation

- Applied to Amendment 3 Participation

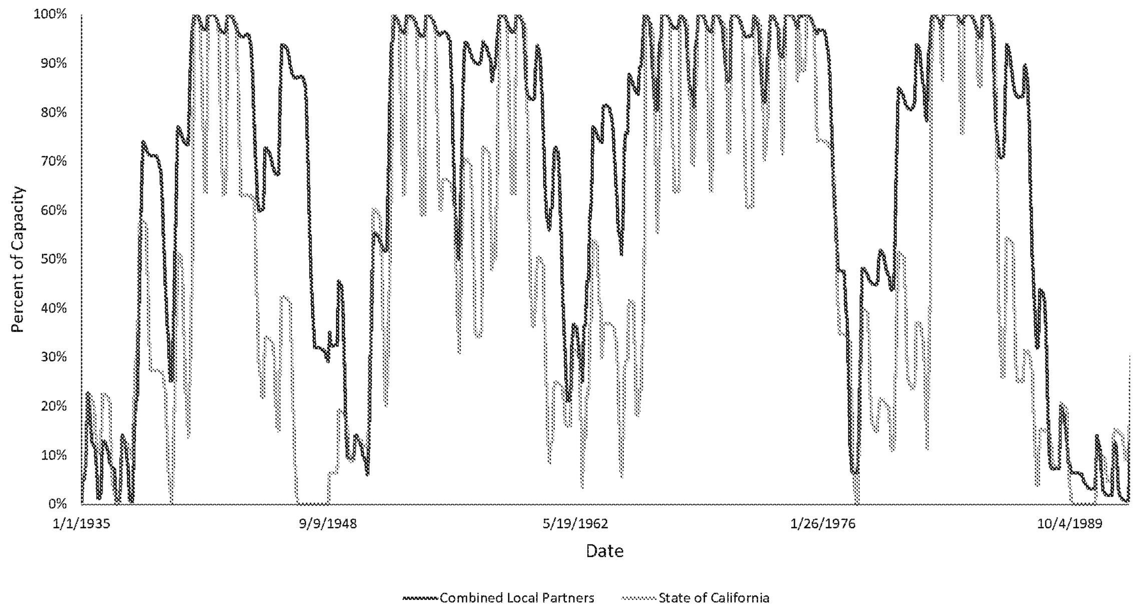
Participant	Amendment 3 Participation (Annualized AF[1])	Amendment 3 Participation (Storage Allocation AF[2])
Antelope Valley-East Kern Water Agency	500	3,117
City of American Canyon	4,000	24,936
Coachella Valley Water District	10,000	62,340
Colusa County	10,000	62,340
Colusa County Water District	9,256	57,702
Cortina Water District	450	2,805
Davis Water District	2,000	12,468
Desert Water Agency	6,500	40,521
Dunnigan Water District	2,972	18,527
Glenn-Colusa Irrigation District	5,000	31,170
Irvine Ranch Water District	1,000	6,234
LaGrande Water District	1,000	6,234
Metropolitan Water District of Southern California	50,000	311,700
Reclamation District 108	4,000	24,936
Rosedale-Rio Bravo Water Storage District	500	3,117
San Bernardino Valley Municipal Water District	21,400	133,408
San Gorgonio Pass Water Agency	14,000	87,276
Santa Clara Valley Water District	500	3,117
Santa Clarita Valley Water Agency	5,000	31,170
Westside Water District	5,375	33,508
Wheeler Ridge-Maricopa Water Storage District	3,050	19,014
Zone 7 Water Agency	10,000	62,340
Public Water Agency (PWA) Total	**166,503**	**1,037,980**

Notes:
1. Participation (annualized AF) is used primarily as the basis of local agency participation and allocation of local cost share of planning/development costs.
2. The storage allocation for the State of California and Bureau of Reclamation are not shown.

Considerations and Timing

- Storage Partners will make management decisions based on their Storage Allocation
- Need to consider entire available supply in Storage Allocation, not just annualized supply
  - Authority's contractual obligation will be to provide:
    - Storage Allocation as dedicated space
    - Proportionate share of diverted water
  - Important consideration for upcoming soft call
- If conversion factor is less than 6.234, does not mean supply is reduced

Considerations – Supply vs. Storage



Next Steps

- Finalize calculations considering change in dead pool and recent survey refinements to reservoir capacity
- Provide additional information to Storage Partners about Storage Allocation and potential supply
- Seek approval to make transition to Storage Allocation based participation
  - Likely brought for approval in April or May
  - Discussions going forward would be based around storage instead of annualized supply

Questions?

From: Jerry Brown [jbrown@sitesproject.org]
Sent: 1/20/2023 8:05:58 AM
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Subject: Sites - Communications Update
Attachments: Sites Reservoir Press Release_Storm Diversion Data_1.18.2023.pdf; Sites Social Media Posts 1.18.23.pdf; Sites Reservoir_January Storm Surface Articles_Coverage Report_1.19.pdf

Sites Board, Reservoir Committee and Participating Agencies,

On the heels of the major storms we've experienced, our team has been working to analyze how much water the storm events would have yielded for Sites Reservoir and our participants. As you know, it is in scenarios like these where Sites thrives.

The analysis found Sites Reservoir could have diverted 120,000 acre-feet of water—less than 4% of Delta outflow—in the two weeks from Jan. 3 to Jan. 15. Long-range forecasts estimate that Sites Reservoir would continue to divert stormwater through at least Feb. 15, for a total 382,000 acre-feet of water.

This data, and the accompanying message that Sites is needed to capture water from major storms to save it for dry years, will be an important part of our outreach and communications in the coming weeks and months. In an effort to share this information widely, we issued a press release yesterday detailing the results of the analysis. We also shared the information on our social media channels. To further share this information, we are asking that our participants distribute through their own channels.

In the past week, we've also seen a positive uptick in the amount of media coverage on Sites, with many news outlets pointing to Sites as a needed solution to California's wild weather swings. We have attached a comprehensive report of media coverage to this email. We will continue looking for ways to share the Sites story and hope that you all will help echo this message.

Thank you all in advance for sharing our information and please reach out if you have any questions.

Thanks,

Jerry

For Immediate Release:
January 18, 2023

Contact: Ann Newton
(310) 774-7639

New Analysis Reveals Recent Storms Would Have Yielded Water for Up to 2 Million People, Farms, and Businesses if Sites Reservoir Were Operational Today

Sacramento, CA - The Sites Project Authority today announced findings from a new analysis that projected Sites Reservoir could have diverted and captured 120,000 acre-feet of water in just two weeks if the reservoir had been operational from Jan. 3 through Jan. 15. Based on forecasted flows, the analysis shows that the reservoir would continue to capture water over the next few weeks as flows continue to run high.

"This is exactly the type of scenario that Sites is being built for—short windows of extremely high flows. There is an untapped opportunity to capture and store a portion of the significant amount of flow from the Sacramento River that occurs during these rare but major storms without impacting the value of these high flows for our environment," said Jerry Brown, Executive Director of the Sites Project Authority.

Sites Reservoir is specifically designed to divert and store water generated by storm events, like the atmospheric rivers that drenched the state in recent weeks, to increase water flexibility, reliability, and resiliency in drier years.

The analysis found Sites Reservoir could have diverted 120,000 acre-feet of water—less than 4% of Delta outflow—from Jan. 3 to Jan. 15. Long-range forecasts estimated that Sites Reservoir would continue to divert stormwater through at least Feb. 15, for a total 382,000 acre-feet of water. A single acre-foot of water is enough to exceed the average annual indoor and outdoor water use of one to two California households, according to the Water Education Foundation.

"The rainstorms that pummeled Northern California would have been Sites' time to shine," said Alicia Forsythe, Environmental Planning and Permitting Manager of the Sites Project Authority. "It would have captured a portion of the flood waters for use in future dry times by farms, families and ecosystems, while leaving lots of water in the Sacramento River and Delta for our environment and fisheries."

While Sacramento River flows started increasing in late December, the Project would have implemented its 7-day pulse flow protection criteria and not started diverting until January 3. The pulse flow protection criteria protects these initial high flow events as they provide value for outmigrating salmon and our river ecosystems.

Periods of heavy rainfall are ideal opportunities to divert and capture water that accumulates quickly but is often lost to flooding and rapid runoff. Sites will not divert any water until all other water rights and regulatory requirements are met. The analysis shows that during these major storms, all these other needs can be met, and Sites would still be able to store excess water while meeting the project's protective diversion criteria.

Sites Reservoir is an off-stream reservoir that will capture and store a portion of stormwater from the Sacramento River and release water to California communities, farms, business, and wildlife during drier years. Sites Reservoir has broad statewide support from cities, counties, water agencies, and irrigation districts throughout the Sacramento Valley, San Joaquin Valley, Bay Area, and Southern California which are working together to advance the project. The Sites Reservoir Project is locally led by the Sites Project Authority which is made up Sacramento Valley water districts, cities, and counties.

Sites is an off-stream reservoir proposed north of the Sacramento-San Joaquin Delta, where it would provide unique water supply and environmental benefits during dry periods, especially during extended drought. Additional information can be found at www.sitesproject.org or on Facebook and Twitter at @SitesProject.

Sites

Sites Reservoir – Storm Coverage
1/19/2022

Media Coverage

- The Mercury News
  - Letters: Water to ocean | Sites Reservoir | Healthy waterways | Expel Santos | Unnecessary travel | Standard time
- The Redlands Daily Facts
  - Storms tell California to upgrade its plumbing
- BizPac Review
  - California sat on authorized and much needed reservoir plan, now massive 'storm flows' head to sea
- LA Times
  - California has lots of catching up to do on flood management — with or without climate change
- ABC 7 KRCR
  - Assemblyman Gallagher discusses Sites Reservoir, flooding
- Ag Net West Radio Network
  - Week in Review: Simultaneous Drought & Flood Emergencies, More Funding for Sites Project
- POLITICO
  - Storms force California to look harder at capturing rainfall to ease drought
- Cal Matters
  - How California can prepare for future floods before a megastorm hits
- Cal Matters
  - Storms tell California to upgrade its plumbing
- Cal Matters (brief)
  - California's unhoused in the eye of the storm
- Ag Net West
  - Sites Reservoir Receives More Funding as California Experiences Substantial Rainstorms

- **OC Register**
  - What California can learn from wave of storms
- **LA Times**
  - Have no Prop. 1 water projects been built in California? No, but they are moving slowly
- **The Porterville Recorder**
  - Analysis: Sites Reservoir could have save hundreds of thousands of acre-feet of water
- **My Mother Lode.com**
  - Local California Assemblyman Calls For More Water Projects

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The Mercury News

Letters: Water to ocean | Sites Reservoir | Healthy waterways | Expel Santos | Unnecessary travel | Standard time

Ed Kahl Woodside - Letters to the Editor

Sites Reservoir could guard against floods

California needs to build the Sites Reservoir to store flood waters from the Sacramento River. It is needed both for water storage and protection from the types of catastrophic floods that inundated California in 1861 and 1605. The 1861 megaflood was caused by a 45-dayatmospheric atmospheric river.

The Sites off-stream reservoir is the most cost-effective way to protect against such storms. It would store 1.8 million acre-feet of water for 5 million homes and agricultural water needs. Govs. Gavin Newsom and Jerry Brown strongly support the Sites project. While it costs $3.9 billion, it is less expensive per acre-foot than other proposals. Federal funds would be available from recently passed infrastructure bills to reduce the cost. Compared to spending $100 billion on high-speed rail, it's a no-brainer to build the Sites Reservoir.

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The Redlands Daily Facts

Storms tell California to upgrade its plumbing

Dan Walters

The rain and snow storms that have pummeled California for weeks have taken nearly two dozen lives and caused billions of dollars in damages to public and private property.

The flip side, however, is that they dropped immense amounts of water on a state that has suffered through severe drought for several years. At one point this month, an astonishing 160,000 cubic feet of water – 1.2 million gallons – was flowing through the Sacramento-San Joaquin Delta every second. That's enough water to fill a reservoir the size of Folsom Lake, about 1 million acre-feet, in three days and doesn't count water falling on other regions, such as Southern California.

Sites

Whether the storms have ended the drought, however, depends on California's ability to capture enough water to fill its badly depleted reservoirs and at least begin to recharge underground aquifers that have been terribly overdrafted by desperate farmers.

So far, only a relatively tiny amount of the immense storm runoff has found its way into storage. For instance, just a trickle of the Delta's heavy flows has been pumped into state and federal aqueducts for delivery to the San Joaquin Valley and Southern California, largely because of rules that that limit diversions to protect endangered species such as the two-inch-long Delta smelt.

This is no time to be dialing back the pumps," state Sen. Melissa Hurtado and Assemblywoman Jasmeet Bains, both Democrats from Bakersfield, told Newsom in a letter last week. "After several years of drought and low reservoir levels, it only makes sense to capitalize on wet conditions."

"We have a moral obligation to provide Californians any relief that is within our control," five Republican congressional members told Biden and Newsom. "Government regulations should not and must not deny our constituents critical water from these storms."

State water officials, however, say their hands are tied by environmental protection rules requiring that initial winter flows be allowed to flush out the Delta and San Francisco Bay.

What's been happening, or not happening, during the weeks-long deluge indicates that California needs some new plumbing to take advantage of the periodic "atmospheric rivers" that bring immense amounts of precipitation.

Meteorologists believe that due to global climate change, the state will experience more erratic weather – prolonged periods of drought interrupted by occasional storm events such as the ones California has been experiencing.

That means we need more storage, such as the Sites Reservoir on the west side of the Sacramento Valley that's been in the planning stage for several decades and sinking basins to recharge aquifers. The long-dormant, $4 billion Sites project now has the ardent support of state and federal officials, as well as some serious money.

The relatively meager diversions from the Delta now allowed by law, meanwhile, bolster the case for the "Delta Conveyance," which would allow more water to be diverted into the state and federal aqueducts, and thus into downstate reservoirs, without running afoul of environmental restrictions. The project has kicked around for six decades, first as a "peripheral canal," later as twin tunnels dubbed "Water Fix," and now a single tunnel.

California water managers will have another chance to fill reservoirs in a few months, when the immense Sierra snowpack that's twice the historic average and still growing melts. We can only hope that Mother Nature releases the snowpack's water slowly enough to avoid destructive floods.

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BizPac Review

California sat on authorized and much needed reservoir plan, now massive 'storm flows' head to sea

Melissa Fine

In the state of California, water is often a topic of conversation. The Beverly Hills elites need boatloads of it to fill their swimming pools, and the farmers who provide the nation with everything from avocados to Angus beef need it to keep the food coming.

It seems the Golden State always has either way too much of the wet stuff or not nearly enough.
So, in 2014, amid one of the driest spells in California's recorded history, residents voted to approve the Water Quality, Supply, and Infrastructure Improvement Act, also known as Proposition One, which authorized "$7.545 billion in general obligation bonds to fund ecosystems and watershed protection and restoration, water supply infrastructure projects, including surface and groundwater storage, and drinking water protection."
Nearly a decade later, as the state is drowning under a parade of atmospheric rivers and cyclone bombs, voters are watching trillions of gallons of water run out to sea and wondering what happened to all those promised reservoirs.

According to the San Francisco Chronicle, "none of the major storage projects, which include new and expanded reservoirs, has gotten off the ground."

"As the state experiences a historic bout of rain and snow this winter, amid another severe water shortage, critics are lamenting the missed opportunity to capture more of the extraordinary runoff that has been swelling rivers, flooding towns and pouring into the sea," the Chronicle reports.

"The seven dedicated storage projects funded by voter-approved Proposition 1 remain in various stages of planning," the outlet continues. "Many are big ventures, including the proposed Sites Reservoir in the Sacramento Valley that would be

Sites

California's eighth largest reservoir. Such efforts require years of design, permitting and fundraising and are not easy to build. Still, some say progress has been too slow given the dire need for water."

On January 11, the California Republican congressional delegation, led by Rep. David G. Valadao (CA – 22), penned a letter to California Governor Gavin Newsom and President Joe Biden, urging them to "prioritize and expedite water storage projects that would help the state be better prepared for future storm events."
"The past few years of catastrophic man-made drought have crushed California families and farms, and with supply chain disruptions further hamstringing our agricultural producers, we have a moral obligation to provide Californians any relief that is within our control," the lawmakers wrote. "Government regulations should not and must not deny our constituents critical water from these storms. While we cannot make it rain, we must take advantage of opportunities to store water when it does and maximize what can be moved at all times through the Delta for the duration of these storms."

"We urge your administrations to direct relevant federal and state agencies to waive all impediments that limit operations of the Delta pumps to ensure none of these storm flows go to waste," they stated. "Time is of the essence."

According to the Chronicle: "Gov. Gavin Newsom has weighed in, too, pledging to expedite the construction of new storage facilities by providing additional funding and removing 'permitting barriers,' not unlike his predecessor Jerry Brown who similarly tried to accelerate the work."

And even as soaked Californians attempt to navigate through flooded streets, as Politico noted on Monday, "the drought is not yet over."

"To many, the storms highlight the need for changes to the vast system to capture rain and snow in the wetter northern part of the state and transfer it to the farms of the Central Valley and the cities of Southern California," Politico reported. "Much of the recent runoff has ended in the sea, even as forecasters warn that the drought is not yet over."

"The state already has plans to start construction on a new reservoir near Sacramento next year," the outlet wrote, "and to increase pumping in the Sacramento-San Joaquin region through the Delta Conveyance project."

Newsom, it reported, is turning to the Biden administration's massive spending packages for relief.
"The governor suggested federal funding from the Inflation Reduction Act and the Bipartisan Infrastructure Law could help fund water supply and flood risk reduction projects," Politico stated. "He also called for a climate bond to fund water and wildfire projects. A 2014 bond approved by voters was meant to help fund new

reservoirs and other water projects, though opposition from local conservation groups has delayed construction."

"Megadroughts. Wildfires. Historic floods and atmospheric rivers," Newsom tweeted on Jan. 10. "This whiplash weather is not an anomaly. California is proof that the climate crisis is real and we have to take it seriously."

But, as the San Francisco Chronicle reported on Jan. 11, flooding of this magnitude is nothing new in California, making it even more maddening that nothing has been done to capture the rainfall.

"The Great Flood of 1862, seemingly lost in time, is the answer to the question: What was the most destructive flood in California history?" it stated.

"Entire towns were destroyed, and farmland and plains turned into lakes as far as the eye could see," the Chronicle continued. "Almost everyone in the state was impacted by the flood, from victims who lost their homes to state employees who, in the chaos and confusion, didn't get paid for more than a year."

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LA Times

California has lots of catching up to do on flood management — with or without climate change

George Skelton

SACRAMENTO — When Leland Stanford became California's governor in 1862, he needed a rowboat to carry him to the Capitol to be sworn in.

Sacramento's streets were flooded. In fact, much of California was. A 300-mile-long lake was created in the Central Valley from near Bakersfield to Red Bluff. At least 4,000 people were killed.

It was the largest flood in the recorded history of California, Nevada and Oregon, dumping 10 feet of water on this state over a 43-day period.

The Great Flood of 1862 followed a 20-year drought. And it occurred half a century before gasoline-burning automobiles began spewing greenhouse gases into the atmosphere, exacerbating human-caused global warming.

Sites

Gov. Gavin Newsom seems, in every other sentence, to blame the intensity of our current storms — or any drought or wildfire — on climate change. We're getting drier and wetter, and the cycles are becoming more frequent, he and experts warn.

OK, I'm no climatologist. But I do read history. And you can acknowledge history without being a climate denier. Burning fossil fuel has warmed the planet and appears to have mucked up our climate. But we'd still suffer terrible droughts and disastrous storms even if all the energy we used was carbon free.

Cycles of drought and flooding have been the California way — nature's way — for eons. There were many droughts and megafloods in California prior to the industrial revolution — before we packed nearly 40 million people into the state, making these events even more disastrous to humans.

And, of course, there were several catastrophic floods in the last century before global warming became acute.
Times columnist Gustavo Arellano recently wrote about the Great Flood of 1938.

"What Southern California has weathered so far this January has been bad but nowhere near as destructive as 1938," he reminded. All the basin's major rivers overflowed their banks. At least 87 people were killed.
At Christmastime in 1955, floods inundated much of Northern California, killing more than 60 people. At least 42 died around Yuba City and Marysville when the Feather River burst its banks.

"California has lots of extremes. We've always had more wet years and drier years than any part of the country," Jay Lund, vice director of the UC Davis Center for Watershed Sciences, once told me. "Every year we're managing for drought and for floods, and we always will."

Yes, and we've got lots of catching up to do on flood management with or without climate change.
The 1955 flooding motivated just enough Northern California legislators and voters eager for flood control to approve new Gov. Pat Brown's then-controversial California Water Project in 1960. It included the huge Oroville Dam on the Feather River.

But the state has added little to its once-prized water system since then. Meanwhile, the population has more than doubled.

One failure is we're not capturing and storing nearly as much floodwater as we should. The primary example is in the Sacramento-San Joaquin River Delta, the source of drinking water for 27 million Californians and irrigation for 3 million acres.

Ideally, we'd be grabbing big pools of nature's gift and storing it for use in dry years. Instead, it escapes through San Francisco Bay and flows into the ocean.

One immediate reason we're capturing less water than we could is a regulation agreed to by the former Trump administration.

Under it, the "first flush" of each season's major storm is reserved for the bay. For two weeks, state and federal pumps at the southern end of the delta have been permitted to pump at only about half capacity.

The main reason is to protect endangered fish. Aggressive pumping reverses San Joaquin River flow, sucking endangered tiny smelt and little salmon into the pumps or mouths of large predator fish. But fish aside, the reverse flows draw in salt water from the bay. And that gets pumped south into Southern California reservoirs.
"That's why we're so focused on the delta tunnel. It's going to allow us to pump large amounts of water during big winter storms without an environmental impact," says Wade Crowfoot, secretary of the state Natural Resources Agency.

Fresher Sacramento River water from the north delta would be siphoned into a 45-mile-long, 39-foot-wide tunnel ending near the southbound aqueducts. If it had been in place, Crowfoot estimates that an additional 131,000 acre-feet of floodwater could have been captured during the current storm as of late last week.
But small delta communities, local farmers and environmentalists worry that if the tunnel existed, water grabbers — meaning San Joaquin agriculture and L.A. — wouldn't just be taking stormwater. They'd also be seizing water during dry summers and droughts, leaving the delta saltier.

All that must be negotiated and litigated. If it's ever built, the $16-billion project probably couldn't be operational until at least 2040.

There also needs to be more storage room for floodwater. There's a perpetual cry for additional costly dams. But we're already dammed to the brim. There are nearly 1,500 dams in California. Practically every good site has been used.

But one sensible dam project is noncontroversial and headed for construction. It's Sites in Colusa County, an off-stream reservoir that would hold 1.5 million acre-feet of water siphoned off the nearby Sacramento River. Construction on the $4.5-billion project could begin in 2025.

Some existing dams, including San Luis in Merced County and Los Vaqueros in Contra Costa County, probably will be expanded.

But the future of storage is underground in depleted aquifers. That's a major focus of state and local governments.

Meanwhile, even with climate change, Newsom didn't need to row a skiff to his recent second inauguration at the Capitol. He was driven to the outdoor ceremony in a big SUV as storm clouds briefly parted.

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Abc7 KRCR
Assemblyman Gallagher discusses Sites Reservoir, flooding
Preston Donion

REDDING, Calif. — With continued valley rain and mountain snow, concerns over how to retain that water have risen once again.

One project that, if completed, could add 1.5-million-acre feet in water storage capacity is the proposed Sites Reservoir in Glenn and Colusa counties. Assemblyman James Gallagher explained the reservoir has bipartisan support, but still faces bureaucratic hurdles on the road to construction, describing what's been done and where the project stands.

"One thing people should know is that we've done a lot of work to move sites forward. You know, I passed legislation in my first term that would help make that project more cost effective when it comes to construction and moving that forward. We successfully advocated with the Water Commission to allocate almost a billion dollars of funding to Sites Reservoir. And then, the federal government came to, you know, Congressman LaMalfa also worked really hard to get federal financing that helps with the funding of that project as well. The big hold up—I mean, the money's there, you know, we've advocated very successfully. The big hold up is under the governor's purview. It's the executive agencies that permit the project, so the State Department of Fish and Wildlife, the Water Resources Control Board, they have yet to issue permits, and they've been going back and forth. There's been studies after studies, analysis, all kinds of environmental review for years now, you know, it's been years since the Water Commission allocated the money. And so, that's where it's the bureaucratic hold up. That's where it is. It's stuck in the bureaucracy, and we need to move this project forward. We should already be building it right now," Gallagher told KRCR's Preston Donion on Friday.

Despite the challenges and the perpetually extended timeline, Assemblyman Gallagher expressed that the project remains important and that work will continue in 2023 to make the reservoir a reality.

"The governor said that he supports the project, and so we stand ready to. We're just saying, look, let's get going, you know, let's get going. We stand ready to work with you in any way possible, but we need to get this project off the ground. It's been far too long, and so it's a frustration because now we see these storm waters, you know, going down the river, we could be utilizing and capturing those storm flows better and it's just it's time to get it done," Gallagher said.

Gallagher also mentioned the importance of improving flood control infrastructure, and emphasized that as a goal in 2023, saying, "We've had localized flooding. We haven't had any levee breaks, you know, fortunately, but we need to continue to invest in our levees and make sure we're protecting our communities. A lot of that work. There has been a lot of positive work done on that front, but it's been mostly in urban areas and so we need to get out and start doing more work in the rural areas to strengthen our levees to make sure our flood control systems are strong enough to withstand these storms."

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Ag Net West Radio Network

Week in Review: Simultaneous Drought & Flood Emergencies, More Funding for Sites Project

Even as California receives massive amounts of rainfall, rural communities are still experiencing drought impacts. The Sites Reservoir Project has recently received an additional $80 million through the Water Infrastructure Improvements for the Nation Act. Ranch manager for Marthedal Enterprises, Austin Hubbell sees ag partnerships as being crucial to the progression of the raisin industry in allowing growers to take initiative and help find solutions to production challenges. John Deere has signed a memorandum of understanding with the American Farm Bureau Federation that addresses the right to repair equipment.

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POLITICO

Storms force California to look harder at capturing rainfall to ease drought

Camille Von Kaenel

SACRAMENTO, Calif. — After the driest three years in the state's modern history, California suddenly has a different problem on its hands: too much water.

An ongoing series of storms drenching the state has forced officials to take measures unfathomable just a month ago, like releasing excess water from reservoirs and pumping surging river flows into storage.

It's also renewing interest in how to better capture rainfall for dry times — an idea long popular in agricultural areas, particularly among Republicans, and now increasingly embraced by Gov. Gavin Newsom and other Democrats.

"As you can see outside with some of the floods, it's not that we don't have water, it's what are we doing with it when we get it," Assemblymember Devon Mathis (R-Visalia) said in an interview.

To many, the storms highlight the need for changes to the vast system to capture rain and snow in the wetter northern part of the state and transfer it to the farms of the Central Valley and the cities of Southern California.

Much of the recent runoff has ended in the sea, even as forecasters warn that the drought is not yet over.

The weather whiplash is not new to California, but climate change is expected to super-charge these extremes. The state already has plans to start construction on a new reservoir near Sacramento next year, and to increase pumping in the Sacramento-San Joaquin region through the Delta Conveyance project.

Mathis and others see this moment as an opening to boost water storage — but they will have to overcome a big price tag, the lack of obvious solutions like big dams, and entrenched polarization around the West's most precious resource. The Republican lawmaker is proposing a law requiring more storage capacity for water, a goal endorsed by Newsom.

Newsom also called for speeding up permitting for new water storage and flood reduction projects, a measure Mathis is now leading in the Assembly. A Democrat is leading a similar measure in the Senate. The proposals risk further conflict over efforts to protect habitat for salmon and other species.

Democratic state lawmakers from farming regions hit hardest by drought also jumped on the opportunity last week to urge officials to divert and store more water rushing through the Delta region to the ocean before the storms end. But laws protecting an endangered species of fish limit the pumping.

The pumps, aqueducts and reservoirs California relies on are "outdated and vulnerable to climate change" and limit the amount of water that can be stored during winter storms, acknowledged the director of the Department of Water Resources, Karla Nemeth.

The limits of large-scale projects have prompted officials to look for alternative ways to boost water supply, like funding more floodplain restoration and allowing certain water managers to more easily divert rivers and rain into underground basins. Los Angeles County is working to build hundreds of small wells and cisterns to grab as much river water as possible.

Two reservoirs have already started using real-time forecasts to take better advantage of California's winter storms. A Democrat wants to expand that technology this year with a proposal in the Assembly.

But it will take years of rain and careful conservation to replenish depleted groundwater supplies after a longstanding drought, said Jeffrey Mount, a senior fellow at the Public Policy Institute of California, a research organization.

"We're at the beginning of an era here in California where we're realizing that we really have to do a better job of taking advantage of these wet periods," he said. "But it's thoroughly disorganized at this point."

Newsom previewed the challenge in his budget proposal last week, calling for an additional $200 million for flood protection. His plan avoided large cuts in drought funding despite a revenue shortfall.

The governor suggested federal funding from the Inflation Reduction Act and the Bipartisan Infrastructure Law could help fund water supply and flood risk reduction projects. He also called for a climate bond to fund water and wildfire projects. A 2014 bond approved by voters was meant to help fund new reservoirs and other water projects, though opposition from local conservation groups has delayed construction.

Dressed casually, instead of his usual suit, the governor then cut his budget presentation short so he could get to the Central Coast and survey storm damage.

"Immediate drought support, 40 days ago, was top of mind," Newsom said. "Right now, what's top of mind is flood investments."

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CalMatters

How California can prepare for future floods before a megastorm hits

Guest Commentary

Californians have suddenly turned their attention from drought to flooding.

Sites

The future likelihood of a series of huge atmospheric rivers in California, a so-called ARk storm scenario, seems to be a certainty. Atmospheric rivers channel moist tropical air towards the West Coast, where mountains condense it to rain and snow. Over the last few weeks, California has suffered through a sneak peak of its devastating potential.

In late December of 1861, weeks of snow and rain from a huge ARk storm caused flooding from Oregon and Idaho to Mexico. The new settlers did not listen to the Indigenous peoples of California who knew that winter meant moving away from the river.

State government had to be temporarily relocated from Sacramento to San Francisco. The California Supreme Court made the move permanently. The Central Valley became an inland sea, and flooding was severe in Southern California. One percent of the state's population died.

These megastorms occur about once every 150 years. Climate change will intensify them.
Flood control reservoirs already line the Sierra Nevada foothills, including Shasta, Oroville, Folsom, New Melones and others. Some reservoir space is emptied each fall to make way for potential oncoming floods, reducing the value of the reservoir for hydroelectric generation, water supply, recreation and cold water storage for fish. Reservoir operators can minimize (but not eliminate) dumping valuable water if no major storm is predicted.

But Sierra Nevada and similar Southern California flood control reservoirs like Prado and Seven Oaks cannot store enough floodwater to sufficiently reduce the effects of atmospheric river megastorms. The reservoirs will fill, but continuous flood flows will pass through as if the reservoirs were not there.
Gigantic new flood control reservoirs could theoretically be built. But the costs would be in the tens of billions of dollars, and the reservoirs would serve little purpose for decades since they would have to be emptied at the start of each flood season. It's unlikely that the Legislature or Congress would invest in such a flood control system.

Indeed, at least $3 billion in levees and floodwater bypasses are needed just to prevent major flood damage in the Central Valley from storms that are expected to occur much more often than megastorms.

Can flood waters be diverted into "off-stream" storage reservoirs for later use? Not really. The proposed giant Sites Reservoir could divert only a small percentage of the water expected in the Sacramento River in even moderate flood events. The value of such reservoirs is largely in their water supply benefits.
Still, much can be done to prepare.

First, California needs to increase investment in flood plain acquisition and expansion and prevent the urbanization of flood-prone areas. Staying out of harm's way is the best idea.

Flood water bypasses help protect the Sacramento Valley and can recharge groundwater. The San Joaquin Valley urgently needs a similar system. It's likely too late to build them in highly urbanized parts of Southern California. Second, property owners who are at risk only from a megaflood should be encouraged to purchase flood insurance. For property outside the "100 year" flood zone, it would be a small annual investment to cover the damage that is bound to occur.

Third, locally managed evacuation drills should be held in areas where the flood risk is highest, such as Sacramento and areas near the Los Angeles and Santa Ana Rivers. A megastorm will require evacuation of millions of people in the Central Valley and parts of the Bay Area and Southern California. The public needs to be prepared.

Californians have spent billions of dollars to prepare for earthquakes and catastrophic wildfires. Recent quakes and fires are often on our mind, and leaders are reacting appropriately.

But Californians have largely forgotten the death tolls and huge property losses of previous deadly floods, and even larger floods are likely to come. They will affect all Californians, and require greater investment in flood preparation, insurance and evacuation planning.

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CalMatters

Storms tell California to upgrade its plumbing

Dan Walters

The rain and snow storms that have pummeled California for weeks have taken nearly two dozen lives and caused billions of dollars in damages to public and private property.

The flip side, however, is that they dropped immense amounts of water on a state that has suffered through severe drought for several years. At one point this month, an astonishing 160,000 cubic feet of water – 1.2 million gallons – was flowing through the Sacramento-San Joaquin Delta every second. That's enough water to fill a reservoir the size of Folsom Lake, about 1 million acre-feet, in three days and doesn't count water falling on other regions, such as Southern California.

Whether the storms have ended the drought, however, depends on California's ability to capture enough water to fill its badly depleted reservoirs and at least begin to recharge underground aquifers that have been terribly overdrafted by desperate farmers.

So far, only a relatively tiny amount of the immense storm runoff has found its way into storage. For instance, just a trickle of the Delta's heavy flows has been pumped into state and federal aqueducts for delivery to the San Joaquin Valley and Southern California, largely because of rules that limit diversions to protect endangered species such as the two-inch-long Delta smelt.

San Joaquin Valley legislators have beseeched President Joe Biden and Gov. Gavin Newsom to relax the rules so that more runoff can be either delivered to farmers or placed in storage, such as the San Luis Reservoir, which is now less than half-full.

"This is no time to be dialing back the pumps," state Sen. Melissa Hurtado and Assemblywoman Jasmeet Bains, both Democrats from Bakersfield, told Newsom in a letter last week. "After several years of drought and low reservoir levels, it only makes sense to capitalize on wet conditions"

"We have a moral obligation to provide Californians any relief that is within our control," five Republican congressional members told Biden and Newsom. "Government regulations should not and must not deny our constituents critical water from these storms."

State water officials, however, say their hands are tied by environmental protection rules requiring that initial winter flows be allowed to flush out the Delta and San Francisco Bay.

What's been happening, or not happening, during the weeks-long deluge indicates that California needs some new plumbing to take advantage of the periodic "atmospheric rivers" that bring immense amounts of precipitation.

Meteorologists believe that due to global climate change, the state will experience more erratic weather – prolonged periods of drought interrupted by occasional storm events such as the ones California has been experiencing.

That means we need more storage, such as the Sites Reservoir on the west side of the Sacramento Valley that's been in the planning stage for several decades and sinking basins to recharge aquifers. The long-dormant, $4 billion Sites project now has the ardent support of state and federal officials, as well as some serious money.

The relatively meager diversions from the Delta now allowed by law, meanwhile, bolster the case for the "Delta Conveyance," which would allow more water to be diverted into the state and federal aqueducts, and thus into downstate reservoirs, without running afoul of environmental restrictions. The project has kicked around for six decades, first as a "peripheral canal," later as twin tunnels dubbed "Water Fix," and now a single tunnel.

Sites

California water managers will have another chance to fill reservoirs in a few months, when the immense Sierra snowpack that's twice the historic average and still growing melts. We can only hope that Mother Nature releases the snowpack's water slowly enough to avoid destructive floods.

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CalMatters
California's unhoused in the eye of the storm
Sameea Kamal

Meanwhile, Gov. Gavin Newsom's request to the federal government for an emergency declaration was approved late Sunday. Newsom has proposed $202 million in his budget proposal to ramp up flood protection. He plans to unveil the rest of his proposal this morning, after which he's scheduled to survey the state's response to the storms. "Our message to Californians is simple: Be hyper-vigilant," he said in a statement.

In their budget priorities, Senate Republicans called Monday for more money for water storage:

- "The current wave of storms highlights the importance of building the Sites Reservoir and providing water conveyance in critical areas of the state. This will provide water storage for 1.5 million homes per year and promote much-needed water access for California's food producers."

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Ag Net West
Sites Reservoir Receives More Funding as California Experiences Substantial Rainstorms
Brian German

The Sites Reservoir project has received additional funding support from the Bureau of Reclamation. Last week, the project received $80 million through the Water Infrastructure Improvements for the Nation Act (WIIN Act). The announcement comes after an additional award of $30 million was provided to the project through the Infrastructure Investment and Jobs Act.

"Thanks to the continued support of our federal elected officials and Commissioner Touton, we are maintaining momentum on Sites Reservoir and advancing critical project milestones," Sites Project Authority Chairman Fritz Durst said in a news release. "Sites will help ensure California has a reliable water supply in the face of prolonged drought uncertainty."

The reservoir project will increase water storage capacity in the state by 1.5 million acre-feet by capturing excess stormwater from the Sacramento River. Sites Project Authority has also been invited to apply for a $2.2 billion low-interest loan through the Environmental Protection Agency's Water Infrastructure Finance and Innovation Act. The entire project is estimated to cost about $5.2 billion.

The funding announcement comes as California experiences a series of significant storm systems. Flooding in areas of the state has once again sparked public discussion as to how California can better manage water. "It's time we manage water differently in California. More of the same will not provide relief from severe drought— but Sites Reservoir is a new source of drought year water that will provide tangible benefits to California's environment, people and farms," Durst noted.

Through the last month of rain events, water supplies in some of the state's largest reservoirs have increased by an average of approximately 10 percent of their holding capacity. The snowpack in the state has already greatly improved since the beginning of last month. According to the California Department of Water Resources, the statewide snowpack is at 76 percent of the April 1 average.

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OC Register
What California can learn from wave of storms
Dan Walters

California, particularly Northern California, was walloped by a major winter rain and snow storm last week and meteorologists expect that high levels of precipitation will continue for at least another week.

Despite some damage and at least one death from local flooding and tree-toppling high winds, the storm and the predictions of more to come are welcome relief from what had appeared to be a prolonged drought.

There are lessons to be learned from this watery wave, if Californians and the politicians they have elected pay attention, to wit:

Sites

— Despite great advances in technology and data collection, weather forecasting is still an imperfect science. Until the storm hit, meteorologists had expected that a phenomenon known as La Niña would continue to block Pacific fronts from reaching the state and thus continue the drought.

That said, there's no guarantee that the 2022-23 season will be a wet one. A year ago we had a similar spurt of precipitation, but it did not continue into the spring.

— Erratic precipitation makes it very difficult for reservoir managers to decide how much water to release and how much to retain for future use. For example, Folsom Lake near Sacramento was scarcely a third full when the storm hit, but the Bureau of Reclamation tripled releases to 24,000 cubic feet a second, worried about the reservoir's ability to absorb runoff in the American River's Sierra watershed.

— Folsom's increased releases are another indication that California lacks enough water storage to cope with precipitation cycles that are becoming less predictable due to climate change. If we had built the additional storage that water managers had long proposed – Auburn Dam upstream from Folsom, for example – it would have meant less guesswork when opportunities arose to capture water from heavy storms.
Preliminary construction had begun on Auburn Dam when, during the 1970s, it was abruptly halted. Other storage projects have been on the drawing board for decades, such as Sites Reservoir on the west side of the Sacramento Valley. Were Sites a reality today, it would be absorbing excess flow from the Sacramento River, banking water for when it would be needed in the future.

The "atmospheric river" now watering California underscores the state's vulnerability to catastrophic flooding.

Last year, a massive study was released, suggesting that climate change creates an and an ever-increasing risk of mega floods that would cause untold death and destruction.

It is the latest update to studies that originated from the historic flooding that struck California during the winter of 1861-62, when California had been a state for scarcely a decade.

As the study noted: "This event, which was characterized by weeks-long sequences of winter storms, produced widespread catastrophic flooding across virtually all of California's lowlands – transforming the interior Sacramento and San Joaquin valleys into a temporary but vast inland sea nearly 300 miles in length and inundating much of the now densely populated coastal plain in present-day Los Angeles and Orange counties."

If such a prolonged deluge occurred again, researchers Xingying Huang and Daniel Swain, wrote, it "would likely produce widespread, catastrophic flooding and subsequently lead to the displacement of millions of people, the long-term closure of critical transportation corridors and ultimately to nearly $1 trillion in overall economic losses."
Again, the American River's situation illustrates the threat. Officials say that Folsom Lake's capacity, nearly one million acre-feet, is too small to protect Sacramento from such a disaster. One rationale for Auburn Dam had been to provide another layer of flood protection.

Will politicians heed the lessons from the current period of prolonged precipitation or continue disengaged business as usual?

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LA Times

Have no Prop. 1 water projects been built in California? No, but they are moving slowly

George Skelton

SACRAMENTO — California voters approved a ballyhooed $7.5-billion bond issue eight-plus years ago thinking the state would build dams and other vital water facilities. But it hasn't built zilch. True or false?
That's the rap: The voters were taken. The state can't get its act together.

Republicans and agriculture interests in particular make that charge, but the complaint also is widespread throughout the state.

There's some truth in the allegation. But it's basically a bum rap.

No dams have been built, that's true. But one will be and two will be expanded. And hundreds of other smaller projects have been completed.

It is true that government bureaucracies at all levels move at a glacial pace. I've always thought that's because agency heads are too skittish politically. They're pressured by their elected bosses not to make them look bad. So, they creep along cautiously.

Also, there's no profit motive to spur swift government action, unlike in the private sector. But the private sector isn't always a great example of competence either. Southwest Airlines demonstrated that over the holidays and Pacific Gas & Electric Co. constantly screws up in accidentally igniting wildfires.
Republicans last week blasted Democrats for alleged inaction on the 2014 bond act, Proposition 1, which passed by a lopsided 2-1 vote. Hardly anyone pays attention to Republicans anymore in Sacramento, but they made some good points this time while being off base on their basic premise.

Let's back up for some perspective.

The $7.5-billion bond was a scaled-down compromise of an earlier $11.1-billion borrowing scheme that was so larded with putrid pork that legislators twice pulled it from the ballot, fearful voters would gag.

Then-Gov. Jerry Brown negotiated with legislative leaders to create the leaner and more digestible Proposition 1.

"Look at these swollen rivers," Assembly Republican leader James Gallagher of Yuba City told me after he and GOP colleagues held a news conference near the rampaging American River in Sacramento last week. "All these waters should be captured."

At the news conference, Gallagher contended that "the Democratic supermajority and the governor have failed to make investments in water infrastructure."

Maybe not as much as Gallagher and the GOP would like, but the state has spent billions and intends to keep spending on water projects.

Gallagher later told me, however, "money is not the problem" for Proposition 1's main dam project, Sites, a proposed off-stream reservoir in Colusa County. It would hold 1.5 million acre-feet of water pumped from the nearby Sacramento River.

"It's been studied since Eisenhower [was president] and is stuck in permitting," the GOP leader said. "It's taking forever. Decades and decades. It's a bureaucratic morass."

Gov. Gavin Newsom apparently doesn't disagree. Last fall, he created "strike teams" to help cut through bureaucratic red tape on Proposition 1 projects.

Sites Project Director Jerry Brown — no relation to the former governor, who lives nearby on his family's ancestral ranch — seems satisfied with the project's progress.

“We’re rolling along,” he told me. “By the end of 2024, we should be all squared away and able to initiate construction in 2025. That will take six or seven years.”

On Wednesday, Brown estimated that if Sites were now operating, it could capture 382,000 acre-feet of stormwater through mid-February.

He estimates the reservoir’s total cost at $4.5 billion — a bit higher than the $3.9 billion listed on a state website. The state has committed $875 million in Proposition 1 money to the project.

The rest will be paid primarily by water users, mainly farm growers. The Metropolitan Water District of Southern California plans to buy 20% of the water. The feds also are kicking in money.

Financing water storage facilities gets complicated.

Under Proposition 1, $2.7 billion is earmarked for storage — above and below ground. But the state money can be used only for “public benefits” such as salmon protection, recreation and flood control. Water users — farmers, homeowners, businesses — pay the rest with higher monthly bills.

Six other storage projects also have qualified for Proposition 1 funds.

There are two dam expansions: Los Vaqueros in Contra Costa County and Pacheco in Santa Clara County. State bond money will pay for $478 million of Los Vaqueros’ nearly $800-million cost. The Pacheco project will get $504 million toward its $2.5-billion tab.

Four groundwater projects also have been approved for Proposition 1 money: in Sacramento ($292 million) and Kern ($89 million) counties, along with the Antelope Valley ($128 million) and Chino Basin ($215 million).

These decisions were left up to the state Water Commission so they wouldn’t become chips in legislative political bargaining.

Proposition 1 was designed for multi-agency involvement, guaranteeing bureaucratic bottlenecks. The water storage projects are all led by local agencies, not the state. Sacramento is contributing money and, with the feds, signing off — gradually — on permits.

"It's slow going — a lot of permitting," says Lisa Lien-Mager, spokesperson for the state Natural Resources Agency. "It's not like the state just writes a check."

The rest of the Proposition 1 money is for myriad projects such as wastewater management, stormwater capture, recycling, and groundwater cleanup.
Of the total bond money, $6.4 billion has been committed to projects and more than $2 billion has been spent, says Nancy Vogel, the Natural Resources Agency's deputy secretary for water. In all, 1,838 projects have been funded and 760 are completed.

So, it's false that zilch has been built. But it's true that many projects are progressing too slowly, even by government standards.

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The Porterville Recorder

Analysis: Sites Reservoir could have save hundreds of thousands of acre-feet of water

The Sites Project Authority which oversees the proposed Sites Reservoir, claimed on Wednesday an analysis found millions could have benefitted by the reservoir capturing water from the recent storms.

The Sites Project Authority announced findings from a new analysis that projected the Sites Reservoir could have diverted and captured 120,000 acre-feet of water in just two weeks if the reservoir had been operational from January 3-15. Based on forecasted flows, the analysis showed the reservoir would continue to capture water over the next few weeks as flows continue to run high, the authority stated. "This is exactly the type of scenario that Sites is being built for — short windows of extremely high flows. There is an untapped opportunity to capture and store a portion of the significant amount of flow from the Sacramento River that occurs during these rare but major storms without impacting the value of these high flows for our environment," said Jerry Brown, Executive Director of the Sites Project Authority.

Sites Reservoir is specifically designed to divert and store water generated by storm events, like the atmospheric rivers that drenched the state in recent weeks, to increase water availability during drought years, the authority stated. The analysis found Sites Reservoir could have diverted 120,000 acre-feet of water — less than 4 percent of Delta outflow — from January 3 to 15, the authority stated.

Long-range forecasts estimated that Sites Reservoir would continue to divert stormwater through at least February 15, for a total 382,000 acre-feet of water, the authority stated. A single acre-foot of water is enough to exceed the average annual indoor and outdoor water use of one to two California households, according to the Water Education Foundation.

"The rainstorms that pummeled Northern California would have been Sites' time to shine," said Alicia Forsythe, Environmental Planning and Permitting Manager of the Sites Project Authority. "It would have captured a portion of the flood waters for use in future dry times by farms, families, and ecosystems, while leaving lots of water in the Sacramento River and Delta for our environment and fisheries."

While Sacramento River flows began increasing in late December, the Project would have implemented its 7-day pulse flow protection criteria and not started diverting until January 3. The pulse flow protection criteria protects these initial high flow events as they provide for out-migrating salmon and river ecosystems. Periods of heavy rainfall are ideal opportunities to divert and capture water that accumulates quickly but is often lost to flooding and rapid runoff, the authority stated.

The authority added Sites won't divert any water until all other water rights and regulatory requirements are met. The analysis showed that during major storms, all needs can be met, and Sites would still be able to store excess water while meeting the project's protective diversion criteria. Sites Reservoir is an off-stream reservoir designed to capture and store a portion of stormwater from the Sacramento River and release water to California communities, farms, business, and wildlife during drought years.

The authority stated the Sites Reservoir has broad statewide support from cities, counties, water agencies, and irrigation districts throughout the Sacramento Valley, San Joaquin Valley, Bay Area, and Southern California which are working together to advance the project.

The Sites Reservoir Project is locally led by the Sites Project Authority which is made up Sacramento Valley water districts, cities, and counties. Sites is an off-stream reservoir proposed north of the Sacramento-San Joaquin Delta, designed to provide water supply and environmental benefits during dry periods, especially during extended drought. Sites would be the first major storage reservoir developed in the state in decades. Additional information can be found at sitesproject.org or on Facebook and Twitter at @SitesProject.

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My Mother Lode.com

Local California Assemblyman Calls For More Water Projects

BJ Hansen

Sacramento, CA — Republican Health Flora, whose California Assembly district stretches into the Copperopolis area of Calaveras County, along with communities like Oakdale and La Grange, is urging Governor Newsom to take bold action on water.

Flora joined other GOP lawmakers at a press conference in Sacramento, and argued, “Conservation alone is not going to solve this crisis. Storage alone is not going to solve this crisis. We need an all-of-the-above approach to water: desalinization, storage, conservation.”

In the background was an earlier article from the Washington Post noting that California was anticipated to receive 22 trillion gallons of water from the recent string of storms.

Flora stated, “This Governor has the ability to do big things, and the ability to take on big, controversial, things. He has done it time and time again. I am calling on the Governor to take on this. He has the ability, and where there is a will, there is a way. Right now there is a way, but we just need the will.”

The last major reservoir project in the state was New Melones in the seventies.

There was also an emphasis at the press conference by others about the desire to get the long-talked about Sites Reservoir in Colusa County further into development.

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From: Jerry Brown [jbrown@sitesproject.org]
Sent: 1/20/2023 8:05:58 AM
To: gevans@countyofcolusa.org; 1cjm@frontiernet.net; tom.arnold@countyofglenn.net; logan@canalfarms.com; fdurst@rd108.org; jsutton@tccanal.com; jdparker@frontiernet.net; glallen337@gmail.com; SchmitzK@SacCounty.net; MJAzevedo@countyofcolusa.org; johnamaro@msn.com; sean@dohertyfarms.com; hreinhard@rd108.org; hcharter69@gmail.com; ccwd2@frontiernet.net; jyoder@countyofglenn.net; tinab@countyofglenn.net; sdemoss@countyofglenn.net; hcharter69@gmail.com; Zachary@CanalFarms.com; DRuiz@westsidewd.com; h2o4u@westsidewd.com; josh@jalpine.com; vfigueroa@pcwa.net; clerk@pcwa.net; PetersonMi@SacCounty.net; SchmitzK@SacCounty.net; BEwart@cityofsacramento.org; asanger@cityofsacramento.org; Felix Hernandez III [fhernandez@cityofamericancanyon.org]; Dwayne Chisam [dchisam@avek.org]; Robert Cheng [rcheng@cvwd.org]; MJAzevedo@countyofcolusa.org; hcharter69@gmail.com; Mark Krause [mkrause@dwa.org]; 'TBettner@gcid.net' [tbettner@gcid.net]; Paul Weghorst [weghorst@irwd.com]; Randall Neudeck [rneudeck@mwdh2o.com]; 'WVanderwaal@rd108.org' [wvanderwaal@rd108.org]; Trent Taylor [ttaylor@rrbwsd.com]; Bob Tincher [bobt@sbvmwd.com]; Lance Eckhart [leckhart@sgpwa.com]; Cindy Kao [ckao@valleywater.org]; Steve Cole [scole@scvwa.org]; Jim Peterson [jimp@chiconut.com]; Jamie Traynham [jamie@tnpfarms.com]; 'WVanderwaal@rd108.org' [wvanderwaal@rd108.org]; Zachary@CanalFarms.com; Allen Myers [flylegacy@yahoo.com]; Rob Kunde [rkunde@wrmwsd.com]; Valerie Pryor [vpryor@zone7water.com]; Jason Holley [jholley@cityofamericancanyon.org]; Sherri Cassidy [scassidy@cityofamericancanyon.org]; Dan Flory [dflory@ppeng.com]; Petya Vasileva [PVasileva@cvwd.org]; Jim Barrett [jbarrett@cvwd.org]; Julia Breyer [jbreyer@cvwd.org]; Sylvia Bermudez [sbermudez@cvwd.org]; gevans@countyofcolusa.org; Ann Nordyke [boardclerk@countyofcolusa.com]; ccwd2@frontiernet.net; Silvia Baca [sbaca@dwa.org]; Steve Johnson [sjohnson@dwa.org]; Jamie Hoffman [JHoffman@dwa.org]; Greg Krzys gkrzys@gcid.net [gkrzys@gcid.net]; Kayla Mendonca [kmendonca@gcid.net]; Kellie Welch [welch@irwd.com]; Gina Vanderploeg [Vanderpl@irwd.com]; Nina Hawk [nhawk@mwdh2o.com]; Lewis Bair [lbair@rd108.org]; Dan Bartel [dbartel@rrbwsd.com]; mmisuraca@rrbwsd.com; Heather Dyer (HeatherD@sbvmwd.com) [heatherd@sbvmwd.com]; Jose Macedo [JoseM@sbvmwd.com]; Thomas Todd [ttodd@sgpwa.com]; Cheryle Stiff [cstiff@sgpwa.com]; ecampbell@sgpwa.com; Katherine Maher [KMaher@valleywater.org]; Ali Elhassan [aelhassan@scvwa.org]; cgfarms@almondgrower.net; Jamie Traynham [jamie@tnpfarms.com]; Jake Spooner [jspoonerfarms@gmail.com]; Mike Urkov [mike.urkov@gmail.com]; Jamie Traynham [jamie@tnpfarms.com]; DRuiz@westsidewd.com; h2o4u@westsidewd.com; Sheridan Nicolas [snicholas@wrmwsd.com]; Carol Mahoney (cmahoney@zone7water.com) [cmahoney@zone7water.com]; Lillian Xie [lxie@zone7water.com]; osolitei@zone7water.com
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BCC: Sandra Yarbrough [syarbrough@sitesproject.org]; Marcia Kivett [MKivett@sitesproject.org]
Subject: Sites - Communications Update
Attachments: Sites Reservoir Press Release_Storm Diversion Data_1.18.2023.pdf; Sites Social Media Posts 1.18.23.pdf; Sites Reservoir_January Storm Surface Articles_Coverage Report_1.19.pdf

Sites Board, Reservoir Committee and Participating Agencies,

On the heels of the major storms we've experienced, our team has been working to analyze how much water the storm events would have yielded for Sites Reservoir and our participants. As you know, it is in scenarios like these where Sites thrives.

The analysis found Sites Reservoir could have diverted 120,000 acre-feet of water—less than 4% of Delta outflow—in the two weeks from Jan. 3 to Jan. 15. Long-range forecasts estimate that Sites Reservoir would continue to divert stormwater through at least Feb. 15, for a total 382,000 acre-feet of water.

This data, and the accompanying message that Sites is needed to capture water from major storms to save it for dry years, will be an important part of our outreach and communications in the coming weeks and months. In an effort to share this information widely, we issued a press release yesterday detailing the results of the analysis. We also shared the information on our social media channels. To further share this information, we are asking that our participants distribute through their own channels.

In the past week, we've also seen a positive uptick in the amount of media coverage on Sites, with many news outlets pointing to Sites as a needed solution to California's wild weather swings. We have attached a comprehensive report of media coverage to this email. We will continue looking for ways to share the Sites story and hope that you all will help echo this message.

Thank you all in advance for sharing our information and please reach out if you have any questions.

Thanks,

Jerry

From: Jerry Brown [jbrown@sitesproject.org]
Sent: 1/20/2023 8:29:47 AM
To: Alicia Forsythe [aforsythe@sitesproject.org]; Ann Newton [anewton@katzandassociates.com]
CC: Kevin Spesert [kspesert@sitesproject.org]; Sara M. Katz [skatz@katzandassociates.com]; Quin La Capra [qlacapra@katzandassociates.com]; Sarah Rossetto [srossetto@katzandassociates.com]
Subject: Re: Sites Storm Diversion Materials for Approval
Attachments: Recent Storms Make the Case for Sites_Blog_Ali Jerry.docx

Nice job Ali! I made a few tweaks but generally follows the same suggestions Ali provided in her comments. I'd like the Katz team to do a final review and then we can post later today. Ali will be the author. Thanks all.

From: Alicia Forsythe <aforsythe@sitesproject.org>
Date: Thursday, January 19, 2023 at 12:29 PM
To: Ann Newton <anewton@katzandassociates.com>
Cc: Jerry Brown <jbrown@sitesproject.org>, Kevin Spesert <kspesert@sitesproject.org>, "Sara M. Katz" <skatz@katzandassociates.com>, Quin La Capra <qlacapra@katzandassociates.com>, Sarah Rossetto <srossetto@katzandassociates.com>
Subject: RE: Sites Storm Diversion Materials for Approval

Hi all – Apologies for taking so long on this, but I wasn't jazzed with the blog. I just felt like it said the same thing as the tweets and the press release. I felt like we should expand or take a little different approach in the blog to continue to build on the messaging.

Attached are some suggestions and thoughts for folks to consider. Maybe this goes too far, but thought I'd throw it out there.

I am leaving for maxwell and will be on the road for the next 1.5 hours.

Ali

Alicia Forsythe | Environmental Planning and Permitting Manager | Sites Project Authority | 916.880.0676 | aforsythe@sitesproject.org | www.SitesProject.org

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From: Ann Newton <anewton@katzandassociates.com>
Sent: Wednesday, January 18, 2023 12:17 PM
To: Alicia Forsythe <aforsythe@sitesproject.org>
Cc: Jerry Brown <jbrown@sitesproject.org>; Kevin Spesert <kspesert@sitesproject.org>; Sara M. Katz <skatz@katzandassociates.com>; Quin La Capra <qlacapra@katzandassociates.com>; Sarah Rossetto <srossetto@katzandassociates.com>
Subject: Re: Sites Storm Diversion Materials for Approval

Thanks all! We will change 3 million to 2 million across all materials and then distribute the press release and social. Holding on the blog until we receive further edits from Ali.

Sent from my iPhone

On Jan 18, 2023, at 12:09 PM, Alicia Forsythe <aforsythe@sitesproject.org> wrote:

Hi all – I think the press release and tweets are ready. I think there might be a little work on the blog. I can work on some mark-ups now.

Ali

Alicia Forsythe | Environmental Planning and Permitting Manager | Sites Project Authority | 916.880.0676 | aforsythe@sitesproject.org | www.SitesProject.org

From: Ann Newton <anewton@katzandassociates.com>
Sent: Wednesday, January 18, 2023 12:03 PM
To: Jerry Brown <jbrown@sitesproject.org>; Alicia Forsythe <aforsythe@sitesproject.org>; Kevin Spesert <kspesert@sitesproject.org>
Cc: Sara M. Katz <skatz@katzandassociates.com>; Quin La Capra <qlacapra@katzandassociates.com>; Sarah Rossetto <srossetto@katzandassociates.com>
Subject: RE: Sites Storm Diversion Materials for Approval

Thanks, Jerry. I was just working up a separate email to suggest a more conservative estimate as well. I had been thinking 4 people per household, but that's not accurate. We will say 2 million. Of course in reality, the water would also go to farms, the environment and businesses, but we just wanted to illustrate an example of how much water this could mean for California.

<image001.png>

From: Jerry Brown <jbrown@sitesproject.org>
Sent: Wednesday, January 18, 2023 11:59 AM
To: Ann Newton <anewton@katzandassociates.com>; Alicia Forsythe <aforsythe@sitesproject.org>; Kevin Spesert <kspesert@sitesproject.org>
Cc: Sara M. Katz <skatz@katzandassociates.com>; Quin La Capra <qlacapra@katzandassociates.com>; Sarah Rossetto <srossetto@katzandassociates.com>
Subject: Re: Sites Storm Diversion Materials for Approval
Importance: Low

All looks good. On the amount of water question and % of outflow:

General rules of thumb is 2 houses use 1 acre foot over the course of a year. So 382,000 AF * 2 = 764,000 homes served for one year. Also general rule of thumb is 2.5 people per home. So 764,000 homes * 2.5 people per home = 1,910,000. So say 2 million people, not 3.

Ali doing one final check on % of outflow calc with MBK.

From: Ann Newton <anewton@katzandassociates.com>
Date: Wednesday, January 18, 2023 at 11:36 AM
To: Jerry Brown <jbrown@sitesproject.org>, Alicia Forsythe <aforsythe@sitesproject.org>, Kevin Spesert <kspesert@sitesproject.org>
Cc: "Sara M. Katz" <skatz@katzandassociates.com>, Quin La Capra <qlacapra@katzandassociates.com>, Sarah Rossetto <srossetto@katzandassociates.com>
Subject: Sites Storm Diversion Materials for Approval

Jerry, Ali and Kevin,

Attached please find three documents for your final review and approval:

1. Press Release
2. Social Media Posts
3. Blog (to be signed by either Jerry or Ali, whoever is preferred)

Couple of quick notes.

4. The press release and social media reflect Ali's edits and the final Tweets she sent us this morning.
5. We would like you to confirm that you are comfortable with how we've quantified the amount of water in the headline. See comment embedded in the release.
6. Priority is social media and press release. If we need more time on the blog, we can post it later this week.

We will await your edits and then do a final QA/QC and distribute through channels only after we get approval. Thanks all!

Ann

<image002.png>

Sites Reservoir

Reconnaissance-Level Biological Surveys Fact Sheet

What is a biological resource?

- Biological resources are defined by aspects of the natural world such as plants, invertebrates, fish, amphibians, reptiles, birds, mammals as well as natural communities that supports them like rivers, streams, ponds, wetlands, grasslands, shrublands, and forests.

What is the purpose of the biological resource survey?

- State and federal environmental laws require agencies to consider the effects of their projects on important biological resources.
- The first step of this process is to do research on existing biological resources and conduct a pedestrian survey also known as a reconnaissance-level survey to visually search a site and document baseline conditions of the site characterizing the existing biological resources (e.g. plants, animals, and habitats).
- Based on the results of the reconnaissance-level survey, additional follow-up surveys may be necessary in order to search for particular biological resources during the appropriate time of year at the site. For example, some plants flower in the spring, while others flower in the fall. Birds generally start breeding in the spring, while most amphibians breed in the winter.
- Some biological resources are referred to as "sensitive or special-status" and/or listed as threatened or endangered by state and federal wildlife agencies (California Department of Fish and Wildlife [CDFW] and U.S. Fish and Wildlife Service [USFWS]) because they are rare in California and/or throughout the nation.
- Not all biological resources are considered "sensitive or special-status" by CDFW and USFWS.
- If/when feasible, resource locations are incorporated into the project design to avoid impacts.

Commented [AJ1]: Suggest removing "amphibian" as there is sensitivity to the CRLF. We aren't doing CRLF as part of the priority 1 surveys.

Commented [AJ2]: Why not? Need to explain to guide Kevin/Conner

What data are collected?

- Biologists will survey the site and map natural communities in the field with handheld Global Positioning System (GPS) units and/or directly onto field maps. The biologists will cover the site by foot, traversing the entire area required in meandering transects to ensure full coverage of accessible areas. This includes the work areas and the survey buffer.
- During the survey, a general inventory of plant and general wildlife species detected by sight, calls, tracks, scat, or other signs will be compiled as well as a determination of potential "sensitive" species that could occur in or nearby. Soil samples may also be taken (up to a liter per location). Observable "sensitive" resources including perennial plants and conspicuous wildlife (i.e., birds and some reptiles) will be recorded and later digitized into a Geographic Information System (GIS) format onto a Biological Resources Map for the project.
- Species collection may be conducted during the survey by permitted biologists.
- Results of the survey will be documented in project reports and "sensitive" resource records may be filed with the California Natural Diversity Database (CNDDB), a public database managed by CDFW.

- The reports and resource records are then available to state and federal wildlife agencies as required by the project's permits and environmental documentation including the Section 7 Incidental Take Permit issued by USFWS and the Mitigated Negative Declaration reviewed by CDFW.

Commented [TD3]: This text is tailored to the geotech permits not the overall project permits, is that what we are going for?

Commented [AJ4R3]: Overall project.

What is the risk level to the landowner?

- Risk level to the landowner is relatively minimal as the state and federal laws pertaining to biological resources are applicable to "projects". Exceptions to this rule are cases involving listed species or sensitive natural communities. In the event sensitive biological resources are present, the landowner is subject to and required to comply with state and federal codes protecting sensitive biological resources.
- The landowner may be required to manage the sensitive resource in the case where the landowner proposes their own project. Even though on private land, that project would be required to comply with the same state and federal laws as the Sites Reservoir Project.
- Future management of a sensitive biological resource is the responsibility of the project's lead state and/or federal agency.

What qualifications do the individuals who collect this data have?

- Biological field supervisors generally have an advanced degree (MA/MS or PhD) and are also typically Certified Wildlife Biologists or Botanists.
- Field staff have at least a BS in Biology, but most have advanced degrees accompanied by specialized trainings and permits to conduct specific species surveys and collect specimens if necessary.

Commented [AJ5]: This needs to change as there may be field supervisors (seasoned biologists) that don't have a masters.

What duties do the individuals who collect these data have?

- Based on our user agreements with the CNDDB, we are obligated to file sensitive biological resource location data with them for use by other researchers in the public and private sectors.
- Researchers and project planners using the CNDDB database must adhere to an "Information Access and Use Agreement" which covers confidentiality for certain resources, data recipients and responsibilities, authorized users, the CNDDB terms of use, and data transmission requirements.

What are the impacts / challenges to the Project if we cannot collect this data at this time?

- Delaying portions of the survey will cause a significant impact to schedule by pushing back the subsequent stages (evaluation, mitigation) required under state and federal law for managing biological resources.

Recent near-record storms make the case for Sites Reservoir

By Ali Forsythe, Environmental and Permitting Manager

A powerful series of storms slammed Northern California in the first days of the new year, producing record rainfall that saturated the ground and made it more vulnerable to flooding and excessive runoff. The rainfall is welcome after the unprecedented drought of the last few years. As we've seen in the news the past few weeks, we've got to do better in more efficiently using these storm flows when they come to save for the inevitable drought periods that define the Mediterranean climate we live in. We're working hard to do that in making Sites Reservoir a reality.

Sites is specifically designed to divert and store water generated by storm events like we've seen these past three weeks to increase water flexibility, reliability, and resiliency in drier years. If Sites were operational this year, we would have been able to divert and store 120,000 acre-feet from January 3 to January 15. That's equal to less than 4% of Delta outflow, leaving plenty of water in the Sacramento River and Delta to serve important ecosystem functions. Additionally, long-range forecasts project Sites would continue to divert stormwater through at least February 15, collecting a total of 382,000 acre-feet of water over this period. All of this water would be diverted after all other water rights and regulatory requirements are met and with the Sites Project's protective diversion criteria.

Some of the recent news articles have identified that new dams in California aren't likely to be built or that all of the good locations for dams are gone. We challenge that position. 19th century dams were on river, assuming snowpack, and in conflict with the environment. This approach is in conflict with the current value system in California and in the face of climate change. Sites is a 21st century surface water storage system. It's a project designed with environmental values side by side with water supply needs and designed to serve these co-equal goals for our changing climate. Sites is off-stream and doesn't dam a major river or natural migration pathways for fish. Sites is a stormwater capture project, diverting only in high flow/flood flow conditions like we're seeing now and doesn't rely on snowpack. Sites diverts through state-of-the-art fish screens and only after highly protective fish criteria have been met. I'm not saying Sites is the silver bullet solution to California's water challenges, but it's an important component and we should not dismiss the fact that we can use human ingenuity to develop new, environmentally conscious infrastructure to solve our challenges today and for generations to come.

We've also heard a lot in recent news articles on groundwater recharge and we agree. Continuing our way of life and prosperity as a state into the future relies on a portfolio of water management efforts – conservation, groundwater management, desalination, conveyance improvements, surface and groundwater storage, and other measures as reflected in the Governor's August 2022 Water Supply Strategy. An "all of the above" strategy is prudent because just like your retirement portfolio, diversity is stability. Each asset will perform better or worse in different scenarios and at different times – and water assets are no different.

Periods of heavy rainfall, like the atmospheric rivers these past few weeks, are ideal opportunities to divert and capture water that accumulates quickly but is lost to flooding and rapid runoff. Atmospheric rivers carry, on average, 400 billion gallons of water—as much water a day as the Mississippi River—leading to storms that can last several days. When there is excess storm and flood water, we must be prepared with infrastructure to capture some of this water for future use while leaving some in our rivers for the important purpose it serves to our natural environment. Sites Reservoir is designed with this in mind.

If recent droughts have taught us anything, it's that we shouldn't pass up any opportunity to store water for the next, inevitable, drier day. We won't have to with Sites Reservoir.

From: Risse, Danielle [Danielle.Risse@hdrinc.com]
Sent: 1/22/2023 12:55:37 PM
To: Janis Offermann [janis@horizonh2o.com]; Alicia Forsythe [aforsythe@sitesproject.org]
CC: Kevin Spesert [kspesert@sitesproject.org]; Laurie Warner Herson [laurie.warner.herson@phenixenv.com]
Subject: RE: Colusa contact for AB 52

We have confirmed that all letters were delivered. Documentation of delivery has been uploaded to sharepoint here: Environmental Planning Team - 2023 Initial Invitation Letter - All Documents (sharepoint.com). I assume next steps will include some outreach directly to each tribe as follow up. Let me know if you need any assistance with that.

Thanks, Danielle

Danielle Risse, M.A.
Office 916-679-8796 **Mobile** 707-372-5007

hdrinc.com/follow-us

From: Risse, Danielle
Sent: Wednesday, January 18, 2023 3:35 PM
To: Janis Offermann <janis@horizonh2o.com>; Alicia Forsythe <aforsythe@sitesproject.org>
Cc: Kevin Spesert <kspesert@sitesproject.org>; Laurie Warner Herson <laurie.warner.herson@phenixenv.com>
Subject: RE: Colusa contact for AB 52

The additional 2 letters were sent out today and copies are on sharepoint.

Thanks, Danielle

Danielle Risse, M.A.
Office 916-679-8796 **Mobile** 707-372-5007

hdrinc.com/follow-us

From: Janis Offermann <janis@horizonh2o.com>
Sent: Wednesday, January 18, 2023 9:23 AM
To: Alicia Forsythe <aforsythe@sitesproject.org>
Cc: Kevin Spesert <kspesert@sitesproject.org>; Laurie Warner Herson <laurie.warner.herson@phenixenv.com>; Risse, Danielle <Danielle.Risse@hdrinc.com>
Subject: Colusa contact for AB 52

Hi, Ali
I was looking at the letters that the USBR sent to the tribes and I noticed that they cc'd Ms. Melissa Mitchum, Director of Tribal Preservation. We should reach out to her for AB 52 purposes, if she is still in that position. Do you want me to do that and try to set up a meeting?

FYI while looking at Colusa's web site, I saw that the current chairperson is Wayne Mitchum, who was just elected in November 2022. But you may already know that.

Also, I alerted Danielle about these changes, and suggested that we resend the TWG letters, just to be polite and let them know that we realize there is a new chairperson.

Lastly, have you heard anything from YD about their EIR comments? If not, I will reach out to Eric.

Thanks
janis

Janis Offermann, MA, RPA
Cultural Resources Practice Lead
Horizon Water and Environment
1801 7th Street, Suite 100
Sacramento, CA 95811
530.220.4918

Sites Reservoir

Cultural Resources Fact Sheet

What is a cultural resource?

- A cultural resource is defined as a district, site, building, structure, or object generally more than 50 years old. "Cultural resources" encompass everything from precontact Native American sites to historic-era refuse dumps to early 20th century buildings.

What is the purpose of the cultural resource survey?

- State and federal environmental laws require agencies to consider the effects of their projects on important cultural resources.
- The first step of this process is to do research on previously recorded cultural resources and conduct a pedestrian survey to locate and document previously unrecorded cultural resources.
- This is called the "inventory" stage. Based on the results of the inventory, additional work may be necessary at some important sites in order further understand the depth and breadth of the site.
- These "important" resources are often referred to as "eligible" because they are eligible for listing in the California Register of Historical Resources and/or the National Register of Historic Places.
    - Examples of eligible cultural resources would include an archaeological site consisting of the remains of a Native American village or an extensive mining site with intact features. Eligibility determinations are based on specific state and federal criteria. Eligible typically require additional analysis and consideration.
- Not all cultural resources are considered eligible.
- If/when feasible, site locations are incorporated into the project design to avoid impacts.

What data are collected?

- Data will only need to be collected from the project footprint, and not an entire parcel.
- When a site is located, the cultural resources specialists will record a written description of the resource on standard California Department of Parks and Recreation cultural resource forms, map the location using a Global Positioning System unit, and take photographs. (NOTE from JL – we could attach blank copies of the 523 forms for reference)
- Results of the inventory will be documented in reports and resource records which will be filed with the appropriate California Historical Resources Information System (CHRIS) repository.
- The reports and resource records are then available to tribes, other cultural resource specialists, and governmental agencies on an as needed basis.
- Cultural resource locations are exempt from public information requests under both state and federal law and are not disseminated in any public document.
- No artifact collection or ground disturbing activities will occur during the inventory stage.
- More extensive investigations (e.g., archaeological excavations), if necessary, would be coordinated with the landowner on a case-by-case basis.

What is the risk level to the landowner?

- Risk level to the landowner is relatively minimal as the state and federal laws pertaining to cultural resources are only applicable to "projects" and not to private landowners and their activities (i.e., the absence or presence of a cultural resource does not impede or restrict the landowner's use of that land).
- Future management of that resource is the responsibility of the project's lead state and/or federal agency.
- The landowner may be required to manage the resource in the case where the landowner proposes their own project. Even though on private land, that project would be required to comply with the same state and federal laws as the Sites Reservoir Project.

What qualifications do the individuals who collect this data have?

- Cultural resources field supervisors generally have an advanced degree (MA/MS or PhD) and are also typically Registered Professional Archaeologists.
- Field staff have at least a BA/BS in Anthropology, Archaeology, History, or Cultural Resource Management.

What duties do the individuals who collect these data have?

- Based on our user agreements with the CHRIS, we are obligated to file site location data with them for use by other researchers. As noted above, these data are restricted to professionals who have a demonstrated need for the records (i.e., usually for project planning or academic research).
- Researchers and project planners using the CHRIS database must adhere to an "Information Access and Use Agreement" which covers confidentiality, data recipients and responsibilities, authorized users, the CHRIS terms of use, and data transmission requirements.

What are the impacts / challenges to the Project if we cannot collect this data at this time?

- Delaying portions of the inventory will cause a significant impact to schedule by pushing back the subsequent stages (evaluation, mitigation) required under state and federal law for managing cultural resources.

From: Alicia Forsythe [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=A6CDF06A7E904B65BAA21702A82AD329-AFORSYTHE]
Sent: 1/24/2023 8:40:43 AM
To: Laurie Warner Herson [laurie.warner.herson@phenixenv.com]
Subject: RE: Admin EIR/EIS Prep Meeting(s) -Presentation
Attachments: 202301_admin Final EIR_EIS Review Prep_Ali.pptx

Fantastic! Here's a few edits. We can review and finalize for Reclamation and ICF review on our 9 AM call also.

Ali

Alicia Forsythe | Environmental Planning and Permitting Manager | Sites Project Authority | 916.880.0676 | aforsythe@sitesproject.org | www.SitesProject.org

From: Laurie Warner Herson <laurie.warner.herson@phenixenv.com>
Sent: Saturday, January 21, 2023 3:57 PM
To: Alicia Forsythe <aforsythe@sitesproject.org>
Subject: Admin EIR/EIS Prep Meeting(s) -Presentation

Hi Ali,

I've put together a draft presentation for your review and consideration. I went back and forth on where to put modeling. I am also happy to add more detail but thought this covers key points. Let me know if we need to reach out to Steve or others to review and/or attend these meetings.

Let me know if you would like us to send invitations once you have received the doodle poll results. Ariel can also run the PowerPoint.

Thanks,

Laurie

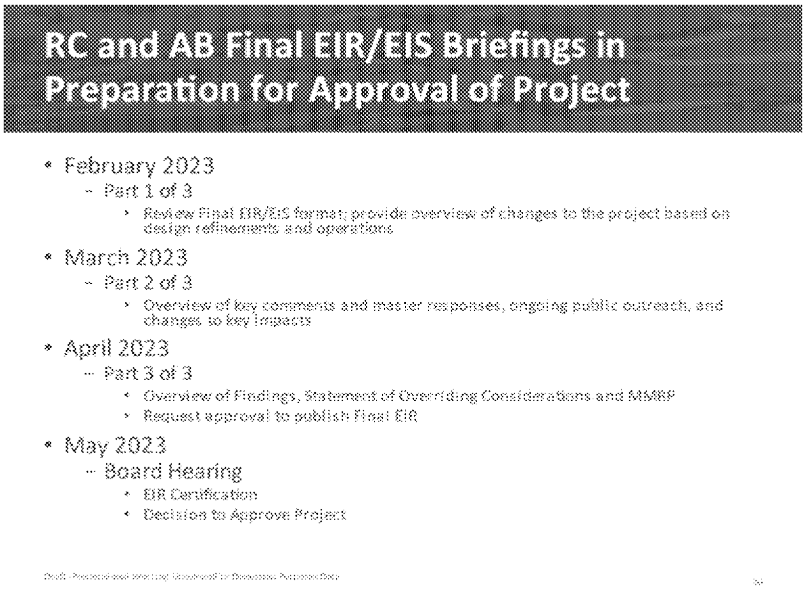
Laurie Warner Herson
Principal/Owner
Phenix
Environmental Planning

916.201.3935
laurie.warner.herson@phenixenv.com
State of California Small Business (#1796182)
Supplier Clearinghouse Women Business Enterprise (#16000323)

http://phenixenv.com/

From: Laurie Warner Herson [laurie.warner.herson@phenixenv.com]
Sent: 1/24/2023 9:04:28 AM
To: Alicia Forsythe [aforsythe@sitesproject.org]
Subject: RE: Admin EIR/EIS Prep Meeting(s) -Presentation

Thanks, by the way, here is the outline for RC/AB EIR/EIS meetings that we provided in December



From: Alicia Forsythe <aforsythe@sitesproject.org>
Sent: Tuesday, January 24, 2023 8:41 AM
To: Laurie Warner Herson <laurie.warner.herson@phenixenv.com>
Subject: RE: Admin EIR/EIS Prep Meeting(s) -Presentation

Fantastic! Here's a few edits. We can review and finalize for Reclamation and ICF review on our 9 AM call also.

Ali

Alicia Forsythe | Environmental Planning and Permitting Manager | Sites Project Authority | 916.880.0676 | aforsythe@sitesproject.org | www.SitesProject.org

From: Laurie Warner Herson <laurie.warner.herson@phenixenv.com>
Sent: Saturday, January 21, 2023 3:57 PM
To: Alicia Forsythe <aforsythe@sitesproject.org>
Subject: Admin EIR/EIS Prep Meeting(s) -Presentation

Hi Ali,

I've put together a draft presentation for your review and consideration. I went back and forth on where to put modeling. I am also happy to add more detail but thought this covers key points. Let me know if we need to reach out to Steve or others to review and/or attend these meetings.

Let me know if you would like us to send invitations once you have received the doodle poll results. Ariel can also run the PowerPoint.

Thanks,

Laurie

Laurie Warner Herson
Principal/Owner
Phenix
Environmental Planning

916.201.3935
laurie.warner.herson@phenixenv.com
State of California Small Business (#1796182)
Supplier Clearinghouse Women Business Enterprise (#16000323)

http://phenixenv.com/

From: Alicia Forsythe [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=A6CDF06A7E904B65BAA21702A82AD329-AFORSYTHE]
Sent: 1/24/2023 3:10:13 PM
To: Jerry Brown [jbrown@sitesproject.org]; Kevin Spesert [kspesert@sitesproject.org]; JP Robinette [jrobinette@sitesproject.org]
CC: Angela Bezzone [bezzone@mbkengineers.com]; Wesley Walker [walker@mbkengineers.com]
Subject: FW: Sites Project - Projected Diversions
Attachments: 2023-01-23 Sites Diversion Forecast Tool.xlsm

Hi all – we have an updated diversion forecast tool. This will be a living tool with updates as we expand its capabilities over time.

The tool is attached. It is also on SharePoint here: Ops Modeling - Daily Diversion Forecast Tool - All Documents (sharepoint.com). We will work to keep the most up to date version of it on SharePoint for everyone's future use.

A few notes from Wes on how the forecast has changed, leading to changes in our projected diversions:

- Releases from Black Butte (Stony Creek) have drastically fallen off, from 10,000 cfs earlier last week to 2,000 cfs by Monday. Most or all of this reduction was not included in the CNRFC forecast earlier this week. This will show up as reduced flow at Wilkins.
- Flow recession on Clear Creek has occurred much quicker than forecasted earlier last week. This has helped drop Bend flows much quicker than previously forecasted.
- Its not clear if the Bend forecast earlier last week included the release reductions at Keswick, which is a slow drop of 1000 cfs from 1/19 to 1/26. This would also drop the forecasted Bend flows.
- Combined tributary flows actually appear to be tracking pretty close to what was forecasted earlier last week, so it appears that most of the change in availability is a result of these unforeseen/unknown operational changes.

Although actual operations are a ways out, these are they types of things that we should keep in mind on making operating decisions and forecasting diversions.

At this time, this tool is NOT intended to be distributed outside of our internal group. While there is nothing confidential in it, its really a work in progress and we don't want it widely distributed at this time.

Thanks again to the MBK team for this fantastic tool!

Ali

Alicia Forsythe | Environmental Planning and Permitting Manager | Sites Project Authority | 916.880.0676 | aforsythe@sitesproject.org | www.SitesProject.org

From: Wesley Walker <walker@mbkengineers.com>
Sent: Tuesday, January 24, 2023 12:36 PM

To: Alicia Forsythe <aforsythe@sitesproject.org>; Angela Bezzone <bezzone@mbkengineers.com>
Cc: Spranza, John <john.spranza@hdrinc.com>
Subject: RE: Sites Project - Projected Diversions

Ali,

Here's an updated copy. I cleaned up some of the formatting on the graph, fixed a few inconsequential errors in the calculations, and changed the resetting threshold to use the 3-day moving average. It starts the upcoming pulse protection 1 day sooner, so it does allow for 1 additional day of diversions. Let us know if you have any questions!

Thanks,
Wes

From: Alicia Forsythe <aforsythe@sitesproject.org>
Sent: Monday, January 23, 2023 2:54 PM
To: Wesley Walker <walker@mbkengineers.com>; Angela Bezzone <bezzone@mbkengineers.com>
Cc: Spranza, John <john.spranza@hdrinc.com>
Subject: RE: Sites Project - Projected Diversions

Super fascinating! This is why I love these tool and this shadow operations as we get to test all of this out and learn these little quirks in the system.

I cant remember what document I was looking at a few days ago, but was looking at the Bend Bridge criteria and thought – interesting, initiation is based on forecast, but resetting is based on hindcast (the 3-day moving average of actual data). We should talk about this on our call when we talk about Wilkins Slough. I don't have a strong preference at this time, but I do remember thinking that there was a difference there in the way it was written.

Thanks Wes!

Ali

Alicia Forsythe | Environmental Planning and Permitting Manager | Sites Project Authority | 916.880.0676 | aforsythe@sitesproject.org | www.SitesProject.org

---

From: Wesley Walker <walker@mbkengineers.com>
Sent: Friday, January 20, 2023 2:42 PM
To: Alicia Forsythe <aforsythe@sitesproject.org>; Angela Bezzone <bezzone@mbkengineers.com>
Cc: Spranza, John <john.spranza@hdrinc.com>
Subject: RE: Sites Project - Projected Diversions

Ali,

Very interesting! I looked into things a bit and checked all of the data pulls, etc. to make sure everything was correct. All of which looks fine. A few things have changed operationally/hydrologically since earlier this week that I don't think were captured in the earlier CNRFC forecasts:

- Releases from Black Butte (Stony Creek) have drastically fallen off, from 10,000 cfs earlier this week to 2,000 cfs by Monday. Most or all of this reduction was not included in the CNRFC forecast earlier this week. This will show up as reduced flow at Wilkins.
- Flow recession on Clear Creek has occurred much quicker than forecasted earlier this week. This has helped drop Bend flows much quicker than previously forecasted.
- Its not clear if the Bend forecast earlier this week included the release reductions at Keswick, which is a slow drop of 1000 cfs from 1/19 to 1/26. This would also drop the forecasted Bend flows from earlier this week.
- Combined tributary flows actually appear to be tracking pretty close to what was forecasted earlier this week, so it appears that most of the change in availability is a result of these unforeseen/unknown operational changes.

One thing that did pop out to me is whether the 7-day "resetting threshold" should be using the 3-day forecasted average or the 3-day moving average? Currently we are using the 3-day forecasted for both the initiation and the resetting thresholds. For this instance (and I think most instances) it does not make much of a difference, as it just changes when the reset occurs by a day or two, not whether it would occur or not. For example, we have a 13-day period (1/21-2/2) where the daily combined tributary flows are near or less than 2,500 cfs, which overlaps a 10-day period (1/24-2/2) where daily Bend flows are near or less than 7,500 cfs. As such, the reset will occur at some point during that period regardless of which 3-day period one uses. Flows then jump above the initiation thresholds on 2/3 which starts the next pulse protection period.

It's also worth noting that even though flows do drop below the resetting thresholds, Bend flow levels generally don't go much lower than ~7,000 cfs. So it won't take much of a change to negate the need for a pulse protection event.

Sorry for the long email, but hopefully that covers everything. Feel free to give us a call if you'd like to discuss!

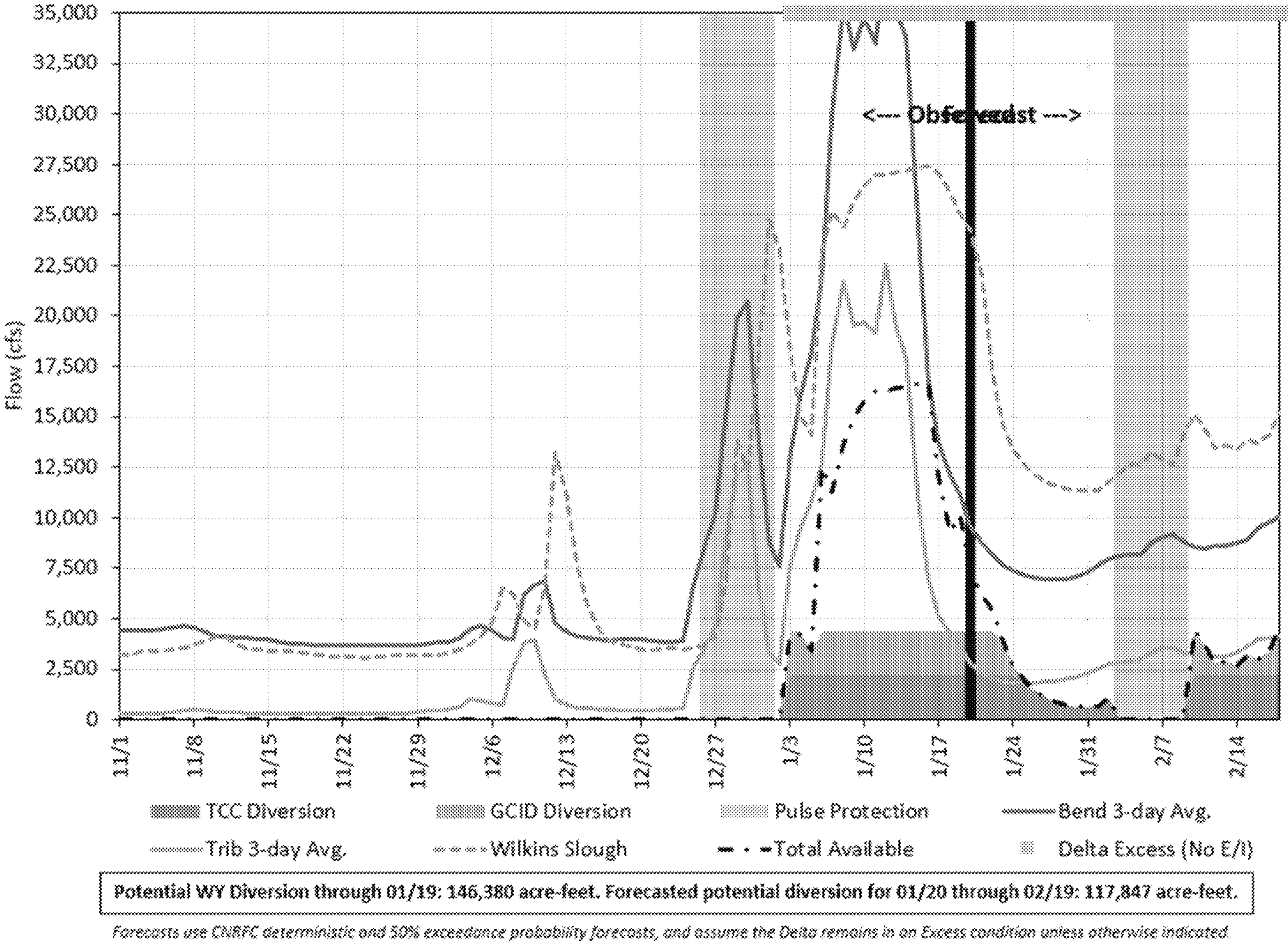
Wes

From: Alicia Forsythe <aforsythe@sitesproject.org>
Sent: Friday, January 20, 2023 11:33 AM
To: Wesley Walker <walker@mbkengineers.com>; Angela Bezzone <bezzone@mbkengineers.com>
Cc: Spranza, John <john.spranza@hdrinc.com>
Subject: Sites Project - Projected Diversions

Hi Wes and Angela – The bad side of developing a tool is lots of questions. 😉

Forecasted flows have dropped quite a bit. The tool is now forecasting a pulse flow protection. But I kind of wonder if that would really be the case, or if its just a very reduced diversion amount. It doesn't seem like we have an increase sufficient to trigger another pulse protection. Can you take a look at this when you get a chance? No rush.

Ali



Alicia Forsythe | Environmental Planning and Permitting Manager | Sites Project Authority | 916.880.0676 | aforsythe@sitesproject.org | www.SitesProject.org

File Provided Natively

From: Spranza, John [John.Spranza@hdrinc.com]
Sent: 1/25/2023 1:57:22 PM
To: Berryman, Ellen (Ellen.Berryman@icf.com) [ellen.berryman@icf.com]; Briard, Monique (Monique.Briard@icfi.com) [Monique.Briard@icfi.com]; Webber, Lisa [lisa.webber@icf.com]
CC: Alicia Forsythe [aforsythe@sitesproject.org]
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12-1
2-3
Tuesday 1/31
9-10
Wednesday 2/1
12-1
1-2
2-3

John Spranza

D 916.679.8858 M 818.640.2487

From: Millsap, Stephanie D <stephanie_millsap@fws.gov>
Sent: Tuesday, January 24, 2023 4:12 PM
To: Hunt, Shane D <shunt@usbr.gov>; Jacobson, Allison M <ajacobson@usbr.gov>; Brick, David A <dbrick@usbr.gov>
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- These modeled large areas are not helpful in a consultation because it becomes more difficult to determine if the proposed action is likely to jeopardize the continued existence of listed species, quantify potential take, and make it more difficult to determine whether a project effect can reasonably be compensated.
- It's better to state the modeled number then, using whatever other criteria your best professional opinion or other information you have, and state those factors (that is, don't say "my best professional opinion", but rather, say, it is my best professional opinion that factors XYZ greatly reduce the likelihood of presence over such a broad area). After this justification provide a lower number, or range, that you feel is probable to be achieved during the eventual on-the-ground surveys.
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  - This may include identifying the locations of potential mitigation lands or banks for each of the species and/or habitat types for which mitigation is proposed and if sufficient acres/credits are available
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Thank you for the opportunity to review and provide technical assistance regarding these federally-listed terrestrial species. I hope these comments are helpful and the Service looks forward to continuing to provide input on these topics.

Sincerely,
-Stephanie

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Stephanie Millsap, Ph.D.
Watershed Planning Division Manager
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U.S. Fish and Wildlife Service
SF Bay Delta Fish and Wildlife Office
650 Capital Mall, Suite 8-300
Sacramento, CA 95814

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From: Spranza, John <John.Spranza@hdrinc.com>
Sent: Wednesday, November 2, 2022 10:42 AM
To: Alicia Forsythe <aforsythe@sitesproject.org>; Dekar, Melissa D <mdekar@usbr.gov>; Hunt, Shane D <shunt@usbr.gov>; Millsap, Stephanie D <stephanie_millsap@fws.gov>; Jacobson, Allison M <ajacobson@usbr.gov>; Reaves, Brittany L <brittany_reaves@fws.gov>; Schoenberg, Steven <steven_schoenberg@fws.gov>; garwin.yip <garwin.yip@noaa.gov>; Stephen Maurano <stephen.maurano@noaa.gov>; Brick, David A <dbrick@usbr.gov>
Subject: [EXTERNAL] Spranza, John shared the folder "2022-Nov_Admin_Draft_BA" with you.

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Regards,
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2022-Nov_Admin_Draft_BA

This link only works for the direct recipients of this message.

Open

Microsoft

Privacy Statement

From:	Berryman, Ellen [Ellen.Berryman@icf.com]
Sent:	1/25/2023 2:28:26 PM
To:	Spranza, John [john.spranza@hdrinc.com]; Briard, Monique [Monique.Briard@icf.com]; Webber, Lisa [Lisa.Webber@icf.com]
CC:	Alicia Forsythe [aforsythe@sitesproject.org]
Subject:	RE: FWS technical assistance on Sites Reservoir terrestrial species RE: [EXTERNAL] Spranza, John shared the folder "2022-Nov_Admin_Draft_BA" with you.

Hi John. The best time slot that works for us is Wednesday, 2/1 from 12 to 2.
The Wednesday 2-3 timeslot is possible but not ideal.
Thanks,
Ellen

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Open

Recent near-record storms make the case for Sites Reservoir

By Ali Forsythe, Environmental and Permitting Manager

A powerful series of storms slammed Northern California in the first days of the new year, producing record rainfall that saturated the ground and made it more vulnerable to flooding and excessive runoff. The rainfall is welcome after the unprecedented drought of the last few years. As we've seen in the news the past few weeks, we've got to do better in more efficiently using these storm flows when they come to save for the inevitable drought periods that define the Mediterranean climate we live in. We're working hard to do that in making Sites Reservoir a reality.

Sites is specifically designed to divert and store water generated by storm events like we've seen these past three weeks to increase water flexibility, reliability, and resiliency in drier years. If Sites were operational this year, we would have been able to divert and store 120,000 acre-feet from January 3 to January 15. That's equal to less than 4% of Delta outflow, leaving plenty of water in the Sacramento River and Delta to serve important ecosystem functions. Additionally, long-range forecasts project Sites would continue to divert stormwater through at least February 15, collecting a total of 382,000 acre-feet of water over this period. All of this water would be diverted after all other water rights and regulatory requirements are met and with the Sites Project's protective diversion criteria.

Some of the recent news articles have identified that new dams in California aren't likely to be built or that all of the good locations for dams are gone. We challenge that position. 19th century dams were on river, assuming snowpack, and in conflict with the environment. This approach is in conflict with the current value system in California and in the face of climate change. Sites is a 21st century surface water storage system. It's a project designed with environmental values side by side with water supply needs and designed to serve these co-equal goals for our changing climate. Sites is off-stream and doesn't dam a major river or natural migration pathways for fish. Sites is a stormwater capture project, diverting only in high flow/flood flow conditions like we're seeing now and doesn't rely on snowpack. Sites diverts through state-of-the-art fish screens and only after highly protective fish criteria have been met. I'm not saying Sites is the silver bullet solution to California's water challenges, but it's an important component and we should not dismiss the fact that we can use human ingenuity to develop new, environmentally conscious infrastructure to solve our challenges today and for generations to come.

We've also heard a lot in recent news articles on groundwater recharge and we agree. Continuing our way of life and prosperity as a state into the future relies on a portfolio of water management efforts – conservation, groundwater management, desalination, conveyance improvements, surface and groundwater storage, and other measures as reflected in the Governor's August 2022 Water Supply Strategy. An "all of the above" strategy is prudent because just like your retirement portfolio, diversity is stability. Each asset will perform better or worse in different scenarios and at different times – and water assets are no different.

Periods of heavy rainfall, like the atmospheric rivers these past few weeks, are ideal opportunities to divert and capture water that accumulates quickly but is lost to flooding and rapid runoff. Atmospheric rivers carry, on average, 400 billion gallons of water—as much water a day as the Mississippi River—leading to storms that can last several days. When there is excess storm and flood water, we must be prepared with infrastructure to capture some of this water for future use while leaving some in our rivers for the important purpose it serves to our natural environment. Sites Reservoir is designed with this in mind.

If recent droughts have taught us anything, it's that we shouldn't pass up any opportunity to store water for the next, inevitable, drier day. We won't have to with Sites Reservoir.

Date: January 26, 2023

Attendees:

- Ali Forsythe
- Laurie Warner Herson
- Sara Katz
- Emily Fan Michaelson

Purpose: To discuss timing and communications to support the release of the Final EIR/EIS.

Notes:

- Planning for certification of the document at the May Board meeting, but this timing may be difficult to meet.
- Need to provide responses to agency comments 10 days before adopting.
- Since the Board has to take action, there will be an opportunity for public comment at the Board meeting.
- Plan to distribute a press release after the Board meeting.
- After the EIS is approved to publish, there is a seven day delay before publication in the Federal Register.
- Planning on a series of briefings at three consecutive Board meetings – February, March and April.
- Need to update environmental review page on website to communicate current expected timing for release of Final EIR/EIS – Spring 2023; revisit in March to see if more specific timing is available to share.
- Update and potentially expand community guide; meet in a few weeks to review community guide and identify needed updates.
- Review existing fact sheet and FAQs and revisit if updates are needed or if information can be pulled into community guide.
- Develop five key topic fact sheets on the following highlight areas:
    - Water quality
    - Fisheries
    - Trinity River
    - Tribal coordination
    - Local community impacts
- Schedule calls to discuss five key topic fact sheets, develop outlines and identify where information will come from.
- Will translate community guide and five key topic fact sheets into Spanish.
- Develop short videos – potentially three 60-second videos – to tell our story and address what this milestone means for the project and what the next steps are.
- Videos could highlight: project team expertise, collaboration and partnering with state and fed to solve tough problems, core values and strategic plan.
- Videos would feature Ali and others, such as potentially Chris and Chuck Bonham.

Action Items:

- Update environmental review webpage with current expected timing for release of Final EIR/EIS.
- Schedule calls to discuss and outline five key topic fact sheets.
- Review existing fact sheet and FAQs for potential updates or for information to add to community guide.
- Schedule call to discuss development of short videos.
- Schedule call in a few weeks to identify needed updates to community guide.

From: Alicia Forsythe [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=A6CDF06A7E904B65BAA21702A82AD329-AFORSYTHE]
Sent: 1/30/2023 8:42:24 AM
To: Jacobson, Allison M [ajacobson@usbr.gov]; Brick, David A [dbrick@usbr.gov]; Laurie Warner Herson [laurie.warner.herson@phenixenv.com]
Subject: RE: Sites Project - Admin Final EIR/EIS Briefings
Attachments: 202301_Admin Final EIR_EIS Review Prep_Final.pdf; 202301_Admin Final EIR_EIS Review Prep_Final.pptx

Hi all – Attached is the final presentation for our meetings today and tomorrow. I've incorporated changes based on David's comments.

Let me know if you see anything more that needs to be changed. Otherwise, we'll just roll with it.

I did make a PDF file already (attached). I was going to wait to send it out until after the presentation. Figured we might make some tweaks to the presentation if we get comments/questions that indicate some things are unclear.

Ali

Alicia Forsythe | Environmental Planning and Permitting Manager | Sites Project Authority | 916.880.0676 | aforsythe@sitesproject.org | www.SitesProject.org

From: Alicia Forsythe
Sent: Wednesday, January 25, 2023 1:53 PM
To: Jacobson, Allison M <ajacobson@usbr.gov>; Brick, David A <dbrick@usbr.gov>
Cc: Laurie Warner Herson <laurie.warner.herson@phenixenv.com>
Subject: Sites Project - Admin Final EIR/EIS Briefings

Hi Allison and David – It looks like the 2 best days for the Cooperating and Responsible Agency briefings are as follows:

Monday, January 30 from 1 to 2 PM
Wednesday, February 1 from either 2 to 3 pm or 3 to 4 pm (my preference would be 3 to 4 pm)

David, do these days/times work for you?

Allison, I think you may have a conflict with the January 30 one. Are you okay with us moving forward if David can attend?

Ali

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Sites Reservoir Project
Administrative Final EIR/EIS

January 2023

1

Agenda

- Purpose of Meeting
  - Provide overview of the Administrative Final EIR/EIS and the review process and schedule
- Approach to the Final EIR/EIS:
  - Final EIR/EIS Development
  - Content and Format
  - Approach to Responses to Comments
- Project Refinements:
  - Preferred Alternative
  - Comparison of RDEIR/SDEIS and Final EIR/EIS Operational Criteria
  - Mitigation Measure Fish-2.1
  - Updated Modeling
  - Facility Refinements
- Review Process and Schedule

2

Approach to Final EIR/EIS

Sites

3

Final EIR/EIS Development

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- Close of public review January 28, 2022
  - 101 comment letters
  - Some comments submitted in form letters and in a petition
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4

Final EIR/EIS Format

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Final EIR/EIS Format (continued)

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- Master Responses
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  - Currently organized by topics in comment response tables
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7

Master Response Topics

- MR1, CEQA and NEPA Process, Regulatory Requirements, and General Comments
- MR2, Alternatives Description and Baseline
- MR3, Hydrology and Hydrologic Modeling
- MR4, Water Quality
- MR5, Aquatic Biological Resources
- MR6, Vegetation, Wetland, and Wildlife Resources
- MR7, Tribal Coordination, Consultation, and Engagement
- MR8, Trinity River
- MR9, Alternatives Development

8

Chapters/Appendices with No Changes

- Chapters
  - 13, Minerals
  - 18, Navigation, Transportation and Traffic
  - 19, Noise
  - 20, Air Quality
  - 22, Cultural Resources
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  - 25, Population and Housing
- Appendix 8B, 9A, 9B, 10A, 10B, 19A, 20A, 20C, 20C1, 20C2, 20C3, 20D, 22A, 24A, 24B, 33C

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Project Refinements

Sites

10

Key Differences

- Changes between RDEIR/SDEIS and Final EIR/EIS:
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  - Revisions to diversion criteria
  - Incorporation of Mitigation Measure Fish-2.1 into Project
  - Revised modeling
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Changed to Alt 3 as Preferred Alternative

Facilities / Operations	Alternative 1 – Authority's Preferred Project in RDEIR/SDEIS	Alternative 2	Alternative 3 – Preferred Alt in the Final EIR/EIS
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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 1
Reclamation Involvement	1. Funding Partner, up to 7% 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
DWR Involvement	Operational Exchanges with Oroville and storage in SWP facilities South-of-Delta	Same as Alt 1	Same as Alt 1
Route to West Side of Reservoir	Bridge across reservoir	Paved road around southern end of reservoir	Same as Alt 1

12

Revised Diversion Criteria

Location (Listed from North to South)	RDEIR/SDEIS with Mitigation Included	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 are 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, (2) hourly gage monitoring at Bend Bridge gage detects the predicted flow of 8,000 cfs, and migrating anadromous fish are detected at RBDD, and (3) pulse protection may cease earlier than 7 days if flows at Bend Bridge exceed 25,000 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

Revised Diversion Criteria (Continued)

Location (Listed from North to South)	RDEIR/SDEIS with Mitigation Included	Final EIR/EIS
Minimum Bypass Flows in the Sacramento River at Wilkins Slough	Chapter 2: In addition to the minimum bypass flows in the Sacramento River at RBPP and the Hamilton City Pump Station, a minimum bypass flow of 8,000 cfs in the Sacramento River at Wilkins Slough would be in place in April and May and 5,000 cfs during the rest of the year Mitigation Measure FISH-2.1: 10,700 cfs in March through May; 5,000 cfs all other times	10,700 cfs October 1 through June 14; 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 is 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

Revised Diversion Criteria (Continued)

Location (Listed from North to South)	RDEIR/SDEIS with Mitigation Included	Final EIR/EIS
Sacramento River Fully Appropriated Stream	Diversions allowed only when the Sacramento River is not fully appropriated (September 1 through June 14)	No change
Excess conditions, as determined by DWR and Reclamation and defined in 2018 COA Addendum	Delta must be in excess for Sites Reservoir diversions	No change
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

15

Incorporation of Mitigation Measure Fish-2.1 into Project

- RDEIR/SDEIS
  - Included Mitigation Measure FISH-2.1 to reduce potential life stage effects on salmonids by increasing the bypass flow requirement at Wilkins Slough
    - Minimum bypass flow requirement of 10,700 cfs at Wilkins Slough in March-May
- Final EIR/EIS
  - Project description now incorporates the requirements of Mitigation Measure FISH-2.1, which have been refined and made more restrictive (the revised diversion criteria on the previous slide)
  - The bypass flow requirement at Wilkins Slough has been developed as an integral component of how the Project is proposed to operate in terms of its water diversion criteria
  - The modeling performed for the Final EIR/EIS includes the revised diversion criteria
  - This eliminates the need for Mitigation Measure FISH-2.1 in the Final EIR/EIS

16

Revised Modeling

- Adjustments made in the CALSIM II modeling between the RDEIR/SDEIS and the Final EIR/EIS to better represent the most up-to-date modeling procedures and actual operations, including:
  - Shasta Lake Operations – expanded exchanges to include more opportunities for fall flow stability and spring pulse enhancement
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  - Delta Salinity Accounting – slightly refined based on revisions to Calsim II coding
  - Period of Diversion to Sites Storage – revised to only include Sept 1 to June 14 to match water right application
  - South of Delta Water Delivery – revised to allow in any year that capacity is available (previously limited to below normal, dry and critically dry years)
  - Updates to Diversion Criteria – revised diversion criteria incorporated

17

Facility Refinements

- The RDEIR/SDEIS noted that:
  - "Preliminary design for facilities described herein will continue to be refined and modifications may occur as needed as the Project proceeds to final design and as part of the ongoing value engineering process undertaken by the Authority."
- Admin Final EIR/EIS includes:
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18

Review Process and Schedule

Sites

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Format for Comments

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21

Where To Go With Questions

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  - Laurie Warner Herson at laurie.warner.herson@phenixenv.com
- CEQA Responsible Agencies
  - Ali Forsythe at aforsythe@sitesproject.org
  - Laurie Warner Herson
- Reclamation staff and NEPA Cooperating Agencies
  - David Brick at dbrick@usbr.gov
  - Allison Jacobson at ajacobson@usbr.gov

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Questions?

Sites

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Sites

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Sites Reservoir Project

Administrative Final EIR/EIS

January 2023

Sites

Agenda

- Purpose of Meeting
  - Provide overview of the Administrative Final EIR/EIS and the review process and schedule
- Approach to the Final EIR/EIS:
  - Final EIR/EIS Development
  - Content and Format
  - Approach to Responses to Comments
- Project Refinements:
  - Preferred Alternative
  - Comparison of RDEIR/SDEIS and Final EIR/EIS Operational Criteria
  - Mitigation Measure Fish-2.1
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Speaker: Ali

Approach to Final EIR/EIS

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Speaker: Laurie/ICF?

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Master responses will ultimately be informed by comments in comment response tables and revised hydrologic modeling results
Preliminary Master Responses Currently Include:
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Aquatic Biological Resources
Trinity River
Alternatives Screening and Selection
Other Analyses and/or Other Modeling (e.g., climate change)

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Review Process and Schedule

Sites

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Speaker: Ali

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  - Laurie Warner Herson
- Reclamation staff and NEPA Cooperating Agencies
  - David Brick at dbrick@usbr.gov
  - Allison Jacobson at ajacobson@usbr.gov

Speaker: Ali

Questions?

Sites

60TAF Operational Dead Pool

- RDEIR/SDEIS assumed operational dead pool at 120TAF
- Revised operational dead pool of 60TAF results in:
  - occasional periods of lower storage and increased evapoconcentration of metals
  - Negligible change in temperature of receiving waters and release of metals to receiving waters
  - When near or at operational dead pool, releases, if needed, into Stone Corral and Funks Creeks:
    - Could have higher concentrations cyanobacteria and cyanotoxins (HABs) than with the 120 TAF dead pool
    - Could have higher metal concentrations than with the 120 TAF dead pool
  - Effects addressed in MR4, Water Quality

Speaker: John, 60 TAF = 323 ft ASL

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Key Topics in Comments

- Comments address:
  - Trinity River impacts
  - Water rights
  - Level of Tribal consultation
  - Need to disclose operations plan
  - Fisheries impacts
  - Flood impacts
  - Faults and earthquake scenarios
  - Groundwater, seepage
  - Feasibility and project costs
  - Need to better define ecosystem benefits
  - Service needs due to changes to the town of Maxwell

Speaker: Laurie

Public Agency Comments

- Tribal:
  - United Auburn Indian Council
  - Winnemem Wintu Tribe (with NGO group)
  - Yocha Dehe Wintun Nation
- Federal:
  - National Marine Fisheries Service
  - US Environmental Protection Agency
- State:
  - California Department of Fish and Wildlife
  - CA Office of Environmental Health and Hazard Assessment
  - Central Valley Regional Water Quality Control Board
  - State Water Resources Control Board, Water Rights Division
- Regional:
  - Contra Costa Water District
  - East Bay Municipal Utility District
  - Local Agencies of the North Delta
- Local:
  - Colusa County Board of Supervisors
  - Maxwell Fire Protection District
  - Maxwell Public Utility District
  - Maxwell Unified School District
- Water NGOs:
  - State Water Contractors
  - Northern California Water Association

Speaker: Laurie

Non-Governmental Organizations Comments

- AquAlliance
- Bay Institute
- California Indian Environmental Alliance
- California Sportfishing Protection Alliance
- CalWild
- Center for Biological Diversity
- Defenders of Wildlife
- Friends of the River
- Golden State Salmon Association
- Golden West Women Flyfishers
- Institute for Fisheries Resources
- Natural Resources Defense Council
- Northern California Council Fly Fishers International
- North Coast Rivers Alliance
- Planning and Conservation League
- Pacific Coast Federation of Fishermen's Associations
- Restore the Delta
- San Francisco Baykeeper
- Save California Salmon
- Sierra Club California

Speaker: Laurie

From: Spranza, John [John.Spranza@hdrinc.com]
Sent: 1/30/2023 9:31:08 AM
To: Turner, Debbie [Debbie.Turner@icf.com]
CC: Berryman, Ellen [Ellen.Berryman@icf.com]; Alicia Forsythe [aforsythe@sitesproject.org]; Arsenijevic, Jelica [jelica.arsenijevic@hdrinc.com]; Luu, Henry [henry.luu@hdrinc.com]; Risse, Danielle [danielle.risse@hdrinc.com]; Lloyd, John [John.Lloyd@hdrinc.com]; Briard, Monique (Monique.Briard@icfi.com) [Monique.Briard@icfi.com]
Subject: RE: Sites - revising inundation area to 498 elevation contour generated by Lidar.

Sounds good Debbie, that's an appropriate methodology for where we are right now.
Thanks.

John Spranza

D 916.679.8858 M 818.640.2487

From: Turner, Debbie <Debbie.Turner@icf.com>
Sent: Tuesday, January 24, 2023 9:28 AM
To: Spranza, John <John.Spranza@hdrinc.com>
Cc: Berryman, Ellen <Ellen.Berryman@icf.com>
Subject: RE: Sites - revising inundation area to 498 elevation contour generated by Lidar.

Hi John,

I added realigning portions of Access Roads B1 and B2 to the list below in red.

Debbie

Debbie Turner | Conservation GIS Analyst | 858.444.3927 (primary phone) | 619.417.4277 (mobile)
Work Schedule: Monday through Thursday 7 am to 3 pm PST
| debbie.turner@icf.com
ICF50 | 525 B Street, Suite 1700, San Diego, CA 92101 USA | icf.com

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From: Berryman, Ellen <Ellen.Berryman@icf.com>
Sent: Monday, January 23, 2023 4:05 PM
To: Turner, Debbie <Debbie.Turner@icf.com>
Subject: FW: Sites - revising inundation area to 498 elevation contour generated by Lidar.

Oh shoot! I already sent this and forgot to cc you!!! Should I send a revised statement?

From: Berryman, Ellen
Sent: Monday, January 23, 2023 3:32 PM
To: John Spranza <John.Spranza@hdrinc.com>
Subject: Sites - revising inundation area to 498 elevation contour generated by Lidar.

Hi John,
Per our discussion today with you and Debbie, we have developed a work-around that would allow us to meet the January 31 deadline for the revised ITP application even though we're missing engineering details. As we discussed this

morning, we know that engineering is in progress and details will change, therefore permit amendments will be needed and it is not necessary to be excessively precise in our impact calculations. As such, our impact estimates for the revised application will be based on a new footprint, using the 498 elevation contour generated by Lidar for the inundation area, with the following items that may or may not need to be updated:

- Realign portions of Sites Lodoga road using the EIR version of the road (Alt 1 v1) to avoid overlap with the new inundation area (this will give us a pre-generated alignment that will help us calculate impacts – the alignment will not be shown on any maps or figures).
- Realign portions of Saddle Dam South access road and South/Huffmaster roads to avoid overlap with new inundation area. Realign portions of Access Roads B1 and B2. ICF GIS will make these edits on an adhoc basis since engineering drawings are not available.
- The Golden Gate and Sites dam footprints will not be revised.
- We are not to include the following polygons that are included in the construction years data layers:
    - Quarry/borrow area northeast of Sites Dam
    - Transmission line that heads south from TRR West
    - Sutton/Lenshan/Wadleigh roads and portions of Maxwell Sites Road/Old Hwy 99 W
- Other minor overlaps/gaps between the Lidar-generated 498 elevation contour/construction years data layers and the Alt 1 v3 inundation area/impact footprint will be disregarded.
- For figures:
    - We will not generate any detailed project figures but will provide CDFW with updated KMZ or GIS data when available.
    - The existing figures will be used as schematics and will not be revised.
    - We will create one new figure that shows impact by year.

We're seeking concurrence from the Authority with this new approach as soon as possible so that we can complete the revised application prior to the Jan 31 deadline.
Thanks!
Ellen

From: Turner, Debbie <Debbie.Turner@icf.com>
Sent: Monday, January 23, 2023 2:32 PM
To: Berryman, Ellen <Ellen.Berryman@icf.com>
Subject: Sites - revising inundation area to 498 elevation contour generated by Lidar.

Hi Ellen,

Per our discussion today with John, the following are the items that may or may not need to be updated in the new impact footprint that will use the 498 elevation contour generated by Lidar for the inundation area.

- Realign portions of Sites Lodoga road using the EIR version of the road (Alt 1 v1) to avoid overlap with the new inundation area.
- Realign portions of Saddle Dam South access road and South/Huffmaster roads to avoid overlap with new inundation area. ICF GIS will make these edits on an adhoc basis since engineering drawings are not available.
- The Golden Gate and Sites dam footprints will not be revised.
- We are not to include the following polygons that are included in the construction years data layers:
    - Quarry/borrow area northeast of Sites Dam
    - Transmission line that heads south from TRR West
    - Sutton/Lenshan/Wadleigh roads and portions of Maxwell Sites Road/Old Hwy 99 W

Other minor overlaps/gaps between the Lidar-generated 498 elevation contour/construction years data layers and the Alt 1 v3 inundation area/impact footprint will be disregarded.

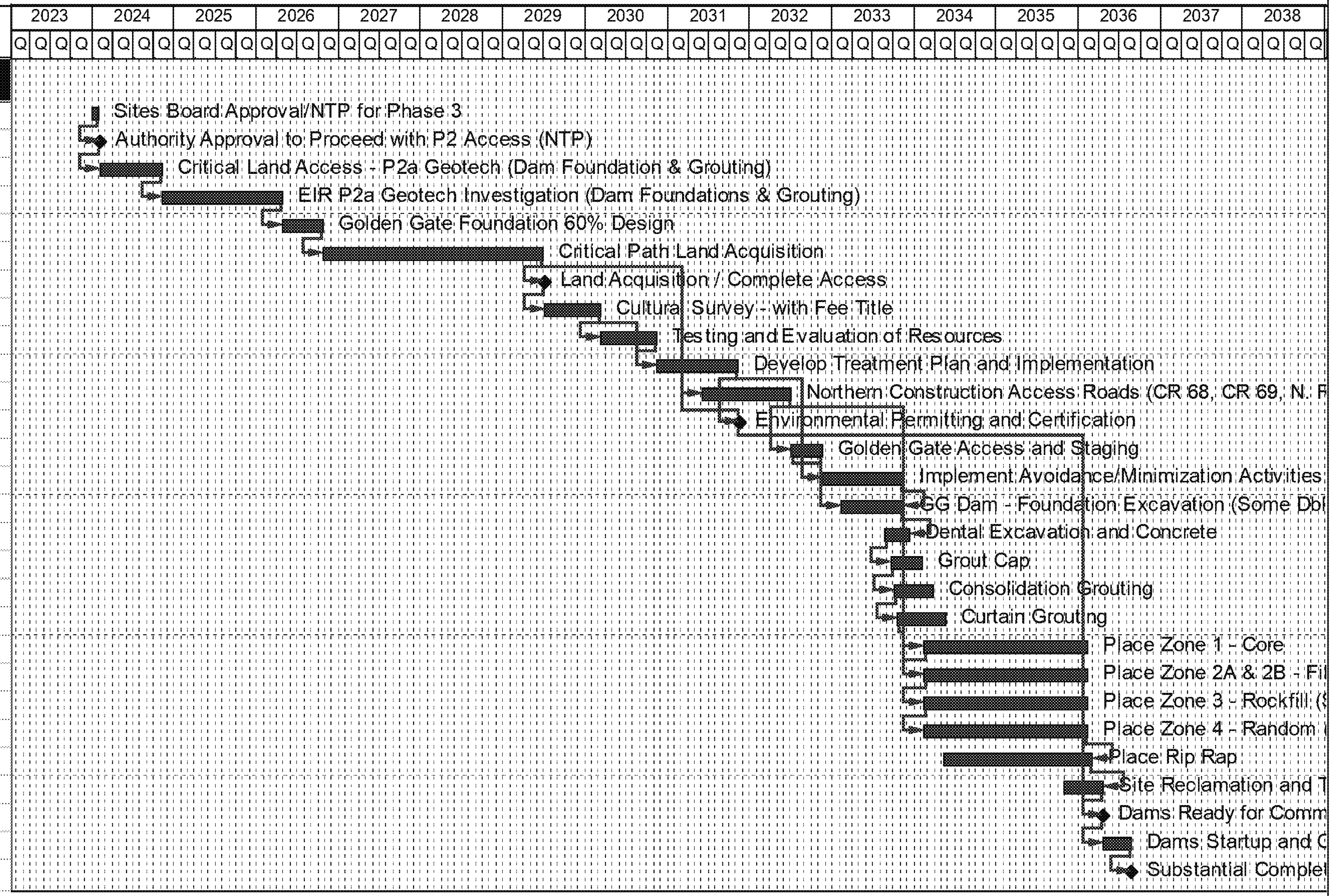
Debbie

Debbie Turner | Conservation GIS Analyst | 858.444.3927 (primary phone) | 619.417.4277 (mobile)
Work Schedule: Monday through Thursday 7 am to 3 pm PST
| debbie.turner@icf.com
ICF50 | 525 B Street, Suite 1700, San Diego, CA 92101 USA | icf.com

Sites Reservoir Project

Schedule

#	Activity ID	Activity Name	Duration	Start	Finish
1	**Sites Reservoir Dams Construction - rev 6 11-09-20**				
2	6	Sites Board Approval/NTP for Phase 3	23	03-Jan-24*	02-Feb-24
3	12	Authority Approval to Proceed with P2 Access (NTP)	0	05-Feb-24*	
4	16	Critical Land Access - P2a Geotech (Dam Foundation & Grouting)	200	05-Feb-24	08-Nov-24
5	82	EIR P2a Geotech Investigation (Dam Foundations & Grouting)	380	11-Nov-24*	24-Apr-26
6	92	Golden Gate Foundation 60% Design	130	27-Apr-26	23-Oct-26
7	19	Critical Path Land Acquisition	700	26-Oct-26	29-Jun-29
8	20	Land Acquisition / Complete Access	0	02-Jul-29	
9	76	Cultural Survey - with Fee Title	180	02-Jul-29	08-Mar-30
10	77	Testing and Evaluation of Resources	180	11-Mar-30	15-Nov-30
11	78	Develop Treatment Plan and Implementation	260	18-Nov-30	14-Nov-31
12	182	Northern Construction Access Roads (CR 68, CR 69, N. Rd)	284	02-Jun-31	01-Jul-32
13	23	Environmental Permitting and Certification	0	17-Nov-31	
14	321	Golden Gate Access and Staging	100	02-Jul-32	18-Nov-32
15	79	Implement Avoidance/Minimization Activities During Construction	260	19-Nov-32	17-Nov-33
16	325	GG Dam - Foundation Excavation (Some Dbl Shift)	200	11-Feb-33	17-Nov-33
17	329	Dental Excavation and Concrete	80	26-Aug-33	15-Dec-33
18	330	Grout Cap	100	23-Sep-33	09-Feb-34
19	331	Consolidation Grouting	125	07-Oct-33	30-Mar-34
20	332	Curtain Grouting	150	21-Oct-33	18-May-34
21	336	Place Zone 1 - Core	525	10-Feb-34	14-Feb-36
22	337	Place Zone 2A & 2B - Filters, Drains and Transitions	525	10-Feb-34	14-Feb-36
23	338	Place Zone 3 - Rockfill (Some Dbl Shift)	525	10-Feb-34	14-Feb-36
24	339	Place Zone 4 - Random (Some Dbl Shift)	525	10-Feb-34	14-Feb-36
25	340	Place Rip Rap	475	12-May-34	06-Mar-36
26	341	Site Reclamation and Topsoil Replacement	120	02-Nov-35	17-Apr-36
27	342	Dams Ready for Commissioning	0	18-Apr-36	
28	343	Dams Startup and Commissioning	90	18-Apr-36	21-Aug-36
29	344	Substantial Completion	0	22-Aug-36	



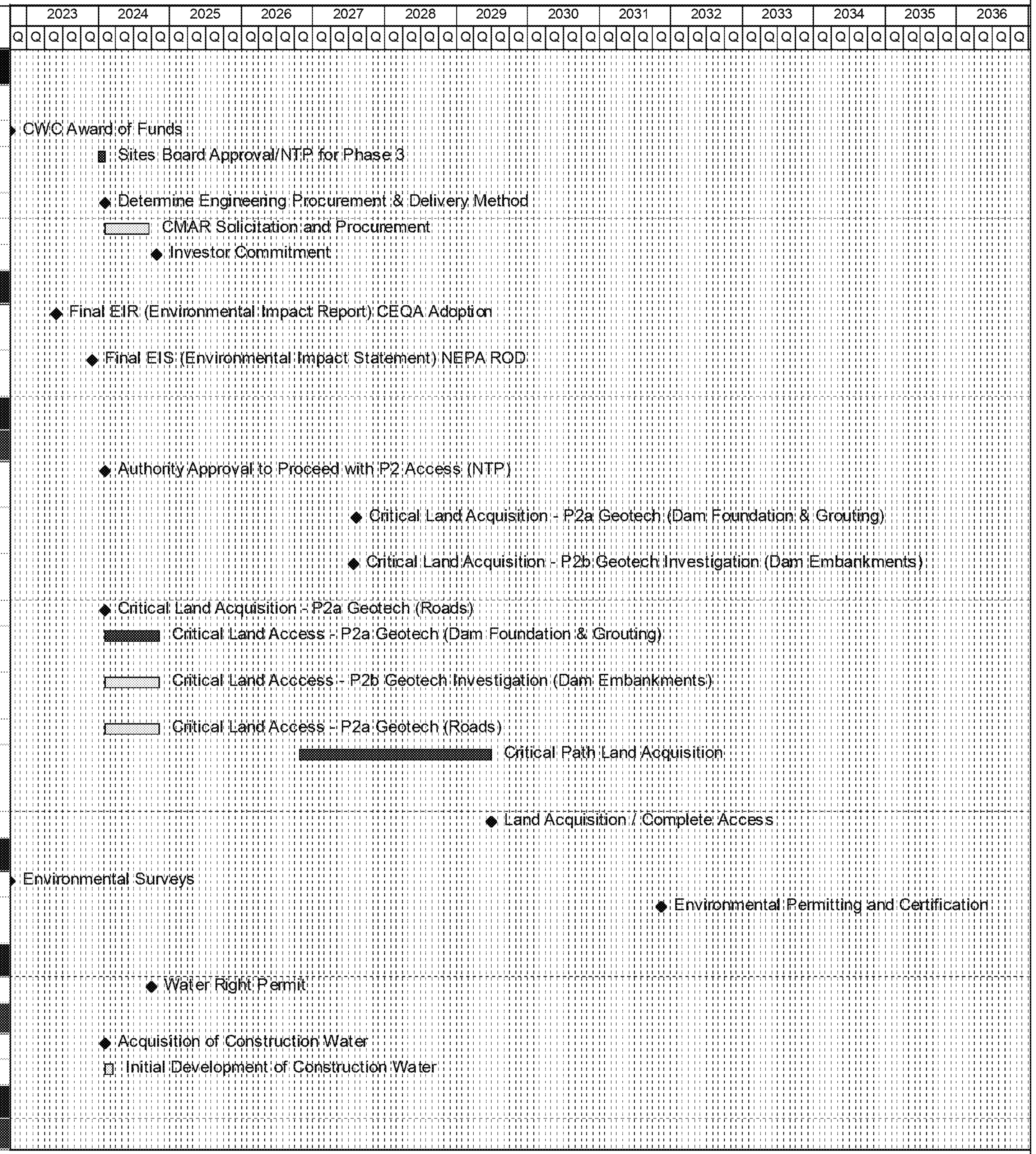
Remaining Level of Effort | Remaining Work
Actual Level of Effort | Critical Remaining Work
Actual Work | Milestone

Project ID: CP1 Version 3 / Project Name: Sites Reservoir Dams Construction - rev 6 11-09-20
Layout Name: Sites Reservoir Critical / TASK filter: Activity ID Equals.
Data Date: 04-Oct-22 / Print Date: 30-Jan-23

Sites Reservoir Project

Schedule with Predecessor and Successor Details

#	Activity ID	Activity Name	Remaining Duration	Start	Finish	Predecessor Details	Successor Details
1		**Sites Reservoir Dams Construction - rev 6 11-09-20**					
2		**Sites Reservoir - CP-1**					
3	5	CWC Award of Funds	0	04-Oct-22			6: FS
4	6	Sites Board Approval/NTP for Phase 3	23	03-Jan-24*	02-Feb-24	5: FS	7: FS, 12: FS, 25: FS, 27: FS
5	7	Determine Engineering Procurement & Delivery Met	0	05-Feb-24		6: FS	8: FS
6	8	CMAR Solicitation and Procurement	160	05-Feb-24	13-Sep-24	7: FS	172: FS
7	9	Investor Commitment	0	24-Oct-24*			
8		**Final EIR / EIS**					
9	3	Final EIR (Environmental Impact Report) CEQA Adoption	0	01-Jun-23*			14: FS, 15: FS, 16: FS, 17: FS, 18: FS, 81: FS
10	4	Final EIS (Environmental Impact Statement) NEPA ROD	0	30-Nov-23*			
11		**Real Estate**					
12		**Land Access and Acquisition**					
13	12	Authority Approval to Proceed with P2 Access (NTP)	0	05-Feb-24*		6: FS	13: FS, 14: FS, 15: FS, 16: FS, 17: FS, 18: FS
14	13	Critical Land Acquisition - P2a Geotech (Dam Foundation & Grouting)	0	09-Aug-27		12: FS, 94: FS	
15	14	Critical Land Acquisition - P2b Geotech Investigation (Dam Embankments)	0	26-Jul-27		12: FS, 117: FS, 3: FS	
16	15	Critical Land Acquisition - P2a Geotech (Roads)	0	05-Feb-24		12: FS, 3: FS	
17	16	Critical Land Access - P2a Geotech (Dam Foundation & Grouting)	200	05-Feb-24	08-Nov-24	12: FS, 3: FS	82: FS
18	17	Critical Land Acccess - P2b Geotech Investigation (Dam Embankments)	200	05-Feb-24	08-Nov-24	12: FS, 3: FS	84: FS
19	18	Critical Land Access - P2a Geotech (Roads)	200	05-Feb-24*	08-Nov-24	12: FS, 3: FS	83: FS
20	19	Critical Path Land Acquisition	700	26-Oct-26	29-Jun-29	92: FS	20: FS, 56: FS, 179: FS, 182: FS -120, 189: FS, 192: FS -120
21	20	Land Acquisition / Complete Access	0	02-Jul-29		19: FS	40: FS, 45: FS, 76: FS
22		**Environmental**					
23	22	Environmental Surveys	0	04-Oct-22			23: FS
24	23	Environmental Permitting and Certification	0	17-Nov-31		22: FS, 73: FS, 78: FS	182: FS -120, 192: FS -40, 342: FS
25		**Water**					
26	25	Water Right Permit	0	26-Sep-24*		6: FS	342: FS
27		**Construction Water**					
28	27	Acquisition of Construction Water	0	05-Feb-24*		6: FS	28: FS, 175: FS
29	28	Initial Development of Construction Water	30	05-Feb-24	15-Mar-24	27: FS	175: FS
30		**Sites Reservoir Permitting, Mitigation and Cultural Work**					
31		**Permitting**					



Remaining Level of Effort | Remaining Work
Actual Level of Effort | Critical Remaining Work
Actual Work | Milestone

Project ID: CP1 Version 3 / Project Name: Sites Reservoir Dams Construction - rev 6 11-09-20
Layout Name: Sites WBS w/ Pred Succ / TASK filter: Less than 100%.
Data Date: 04-Oct-22 / Print Date: 30-Jan-23

#	Activity ID	Activity Name	Remaining Duration	Start	Finish	Predecessor Details	Successor Details
32		**Baseline Surveys and Revised ESA Consultation**					
33	32	Access Granted for Biological Surveys	0	27-Apr-26		92: SS	33: FS 7, 36: SS, 59: FS, 73: FS, 75: FS
34	33	Plant Survey 1	15	06-May-26*	26-May-26	32: FS 7	34: FS 20
35	34	Plant Survey 2	15	24-Jun-26	14-Jul-26	33: FS 20	35: FS 20
36	35	Plant Survey 3 and Report	45	12-Aug-26	13-Oct-26	34: FS 20	67: FS, 69: FS
37	36	Land Cover Verification/Aquatic Delineation #1	15	27-Apr-26*	15-May-26	32: SS	37: FS 15, 52: SS
38	37	Land Cover Verification/Aquatic Delineation #2	15	08-Jun-26	26-Jun-26	36: FS 15	38: FS 15
39	38	Land Cover Verification/Aquatic Delineation and Report	45	20-Jul-26	18-Sep-26	37: FS 15	39: FS
40	39	Revise Impact Acres and Work with Agencies	60	21-Sep-26	11-Dec-26	38: FS	40: FS, 45: FS
41	40	BUOW #1 (Burrowing Owls Study)	5	01-Apr-30*	05-Apr-30	39: FS, 20: FS	41: FS 15
42	41	BUOW #2	5	29-Apr-30	03-May-30	40: FS 15	42: FS 20
43	42	BUOW #3	5	03-Jun-30	07-Jun-30	41: FS 20	43: FS 20
44	43	BUOW #4 and Report	30	08-Jul-30	16-Aug-30	42: FS 20	44: FS
45	44	BUOW Relocation	15	19-Aug-30*	06-Sep-30	43: FS	321: FS
46	45	SWHA #1 and TCBB #1	5	01-Mar-30*	07-Mar-30	39: FS, 20: FS	46: FS 15
47	46	SWHA #2 and TCBB #2	5	29-Mar-30	04-Apr-30	45: FS 15	47: FS 15
48	47	SWHA #3 and TCBB #3	5	26-Apr-30	02-May-30	46: FS 15	48: FS 20, 51: FS, 58: FS
49	48	SWHA #4	5	31-May-30	06-Jun-30	47: FS 20	49: FS 15
50	49	SWHA #5	5	28-Jun-30	04-Jul-30	48: FS 15	50: FS 7
51	50	SWHA #6 and Report	30	16-Jul-30	26-Aug-30	49: FS 7	67: FS, 69: FS
52	51	TCBB Report	30	03-May-30	13-Jun-30	47: FS	69: FS
53	52	Vernal Pool Wet Season Survey 1	10	03-Dec-29*	14-Dec-29	36: SS	53: FS 15
54	53	Vernal Pool Wet Season Survey 2	10	07-Jan-30	18-Jan-30	52: FS 15	54: FS 15
55	54	Vernal Pool Wet Season Survey 3	10	11-Feb-30	22-Feb-30	53: FS 15	55: FS 15
56	55	Vernal Pool Wet Season Survey 4 (more may be needed) and Report	60	18-Mar-30	07-Jun-30	54: FS 15	67: FS
57	56	VELB Survey and Report	30	30-Apr-30*	10-Jun-30	19: FS	57: FS 150, 60: SS, 67: FS
58	57	VELB Transplant	20	07-Jan-31	03-Feb-31	56: FS 150	321: FS
59	58	Bank Swallow Survey and Report	30	03-May-30	13-Jun-30	47: FS	64: FS, 69: FS
60	59	CRLF Surveys and Report	200	03-Jan-30*	09-Oct-30	32: FS	67: FS
61	60	Bumble Bee Survey 1	5	30-Apr-30	06-May-30	56: SS	61: FS 15
62	61	Bumble Bee Survey 2	5	28-May-30	03-Jun-30	60: FS 15	62: FS 15
63	62	Bumble Bee Survey 3	5	25-Jun-30	01-Jul-30	61: FS 15	63: FS 15
64	63	Bumble Bee Survey 4 and Report	45	23-Jul-30	23-Sep-30	62: FS 15	69: FS
65	64	Badger Survey and Report	30	14-Jun-30	25-Jul-30	58: FS	65: FS
66	65	Bat Survey (Roosts)	10	26-Jul-30	08-Aug-30	64: FS	66: FS
67	66	Bat Roosts Removal	10	09-Aug-30	22-Aug-30	65: FS	321: FS
68	67	USFWS - Amend ESA Consultation: Prepare Report and Submit	90	10-Oct-30	12-Feb-31	35: FS, 50: FS, 55: FS, 56: FS, 59: FS	68: FS
69	68	USFWS Review and Amend ESA Permit and Take Statement	120	13-Feb-31	30-Jul-31	67: FS	321: FS
70	69	CDFW - Amend ESA ITP: Prepare Report and Submit	90	24-Sep-30	27-Jan-31	35: FS, 50: FS, 51: FS, 58: FS, 63: FS	70: FS
71	70	CDFW Review Report and Ament ITP Take Statem	120	28-Jan-31	14-Jul-31	69: FS	71: FS 15
72	71	Precon Avoidance (GGS, Avian, mammal, other CEQA spp)	30	05-Aug-31	15-Sep-31	70: FS 15	321: FS
73		**Compensatory Mitigation**					

Remaining Level of Effort — Remaining Work
Actual Level of Effort — Critical Remaining Work
Actual Work — ◆ Milestone

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Layout Name: Sites WBS w/ Pred Succ / TASK filter: Less than 100%.
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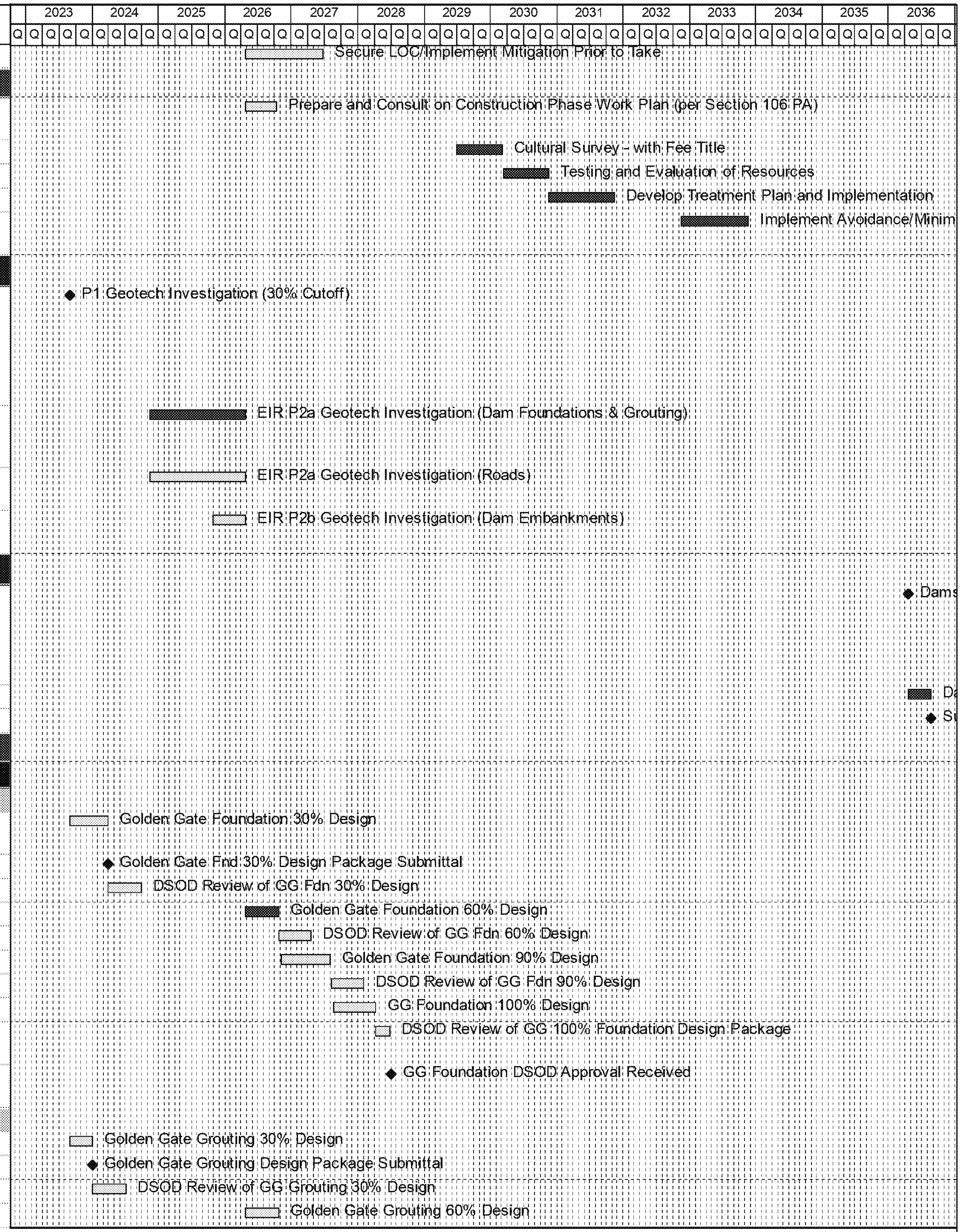
#	Activity ID	Activity Name	Remaining Duration	Start	Finish	Predecessor Details	Successor Details
74	73	Secure LOC/Implement Mitigation Prior to Take	305	27-Apr-26	25-Jun-27	32: FS	23: FS, 78: FS
75	Cultural Work						
76	75	Prepare and Consult on Construction Phase Work Plan (per Section 106 PA)	120	27-Apr-26	09-Oct-26	32: FS	76: FS
77	76	Cultural Survey - with Fee Title	180	02-Jul-29	08-Mar-30	75: FS, 20: FS	77: FS, 78: FS
78	77	Testing and Evaluation of Resources	180	11-Mar-30	15-Nov-30	76: FS	78: FS
79	78	Develop Treatment Plan and Implementation	260	18-Nov-30	14-Nov-31	76: FS, 73: FS, 77: FS	23: FS, 79: FS
80	79	Implement Avoidance/Minimization Activities During Construction	260	19-Nov-32	17-Nov-33	78: FS, 321: FS	325: FF
81	P1 / P2 Geotech Investigations						
82	81	P1 Geotech Investigation (30% Cutoff)	0	31-Aug-23*		3: FS	82: FS, 83: FS, 89: FS, 100: FS, 101: FS, 111: FS, 112: FS, 124: FS, 136: FS, 137: FS, 148: FS, 149: FS, 160: FS, 184: FS 260, 209: FS
83	82	EIR P2a Geotech Investigation (Dam Foundations & Grouting)	380	11-Nov-24*	24-Apr-26	16: FS, 81: FS	84: SS 250, 92: FS, 103: FS, 127: FS, 139: FS, 163: FS
84	83	EIR P2a Geotech Investigation (Roads)	380	11-Nov-24*	24-Apr-26	81: FS, 18: FS	179: FS, 189: FS, 194: FS, 199: FS, 204: FS
85	84	EIR P2b Geotech Investigation (Dam Embankments)	130	27-Oct-25*	24-Apr-26	17: FS, 82: SS 250	114: FS, 151: FS, 163: FS
86	Reservoir Facilities						
87	342	Dams Ready for Commissioning	0	18-Apr-36		287: FS, 207: FS, 202: FS, 318: FS, 341: FS, 286: FS, 284: FS, 254: FS, 233: FS, 197: FS, 25: FS, 23: FS, 275: FS	343: FS
88	343	Dams Startup and Commissioning	90	18-Apr-36	21-Aug-36	342: FS	344: FS
89	344	Substantial Completion	0	22-Aug-36		343: FS	
90	Engineering - Dams						
91	Golden Gate Dam Design						
92	Golden Gate Foundation Design						
93	89	Golden Gate Foundation 30% Design	151	31-Aug-23	28-Mar-24*	81: FS	90: FS, 100: SS, 111: SS 200
94	90	Golden Gate Fnd 30% Design Package Submittal	0	29-Mar-24		89: FS	91: FS
95	91	DSOD Review of GG Fdn 30% Design	130	29-Mar-24	26-Sep-24	90: FS	92: SS 10
96	92	Golden Gate Foundation 60% Design	130	27-Apr-26	23-Oct-26	82: FS, 91: SS 10	19: FS, 32: SS, 93: FS
97	93	DSOD Review of GG Fdn 60% Design	130	26-Oct-26	23-Apr-27	92: FS	94: SS 10
98	94	Golden Gate Foundation 90% Design	195	09-Nov-26	06-Aug-27	93: SS 10	13: FS, 95: FS
99	95	DSOD Review of GG Fdn 90% Design	130	09-Aug-27	04-Feb-28	94: FS	96: SS 10
100	96	GG Foundation 100% Design	165	23-Aug-27	07-Apr-28	95: SS 10	97: FS
101	97	DSOD Review of GG 100% Foundation Design Package	60	10-Apr-28	30-Jun-28	96: FS	98: FS
102	98	GG Foundation DSOD Approval Received	0	03-Jul-28		97: FS	240: FS, 294: FS, 321: FS, 325: FS
103	Golden Gate Grouting Design						
104	100	Golden Gate Grouting 30% Design	91	31-Aug-23	04-Jan-24*	89: SS, 81: FS	101: FS
105	101	Golden Gate Grouting Design Package Submittal	0	05-Jan-24		81: FS, 100: FS	102: FS
106	102	DSOD Review of GG Grouting 30% Design	130	05-Jan-24	04-Jul-24	101: FS	103: SS 10
107	103	Golden Gate Grouting 60% Design	130	27-Apr-26	23-Oct-26	102: SS 10, 82: FS	104: FS



Remaining Level of Effort | Remaining Work
Actual Level of Effort | Critical Remaining Work
Actual Work | ◆ Milestone

Project ID: CP1 Version 3 / Project Name: Sites Reservoir Dams Construction - rev 6 11-09-20
Layout Name: Sites WBS w/ Pred Succ / TASK filter: Less than 100%.
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#	Activity ID	Activity Name	Remaining Duration	Start	Finish	Predecessor Details	Successor Details
108	104	DSOD Review of GG Grouting 60% Design	130	26-Oct-26	23-Apr-27	103: FS	105: SS 10, 106: FS
109	105	Golden Gate Grouting 90% Design	120	09-Nov-26	23-Apr-27	104: SS 10	106: FS
110	106	DSOD Review of GG Grouting 90% Design	130	26-Apr-27	22-Oct-27	105: FS, 104: FS	107: SS 10
111	107	GG Grouting 100% Design	130	10-May-27	05-Nov-27	106: SS 10	108: FS
112	108	DSOD Review of GG 100% Grouting Design Packa	60	08-Nov-27	28-Jan-28	107: FS	109: FS
113	109	GG Grouting DSOD Approval Received	0	31-Jan-28		108: FS	330: FS
114		**Golden Gate Embankment Design**					
115	111	Golden Gate Embankment 30% Design	91	06-Jun-24	10-Oct-24*	81: FS, 89: SS 200	112: FS
116	112	Golden Gate Embankment Design Package Submittal	0	11-Oct-24		111: FS, 81: FS	113: FS
117	113	DSOD Review of GG Embankment 30% Design	130	11-Oct-24	10-Apr-25	112: FS	116: FS
118	114	Golden Gate Borrow and Quarry Geotech Data	0	27-Apr-26		84: FS	115: FS
119	115	Golden Gate Embankment 60% Design	195	27-Apr-26	22-Jan-27	114: FS	116: FS, 209: FS
120	116	DSOD Review of GG Embankment 60% Design	130	25-Jan-27	23-Jul-27	115: FS, 113: FS	117: SS 10
121	117	Golden Gate Embankment 90% Design	120	08-Feb-27	23-Jul-27	116: SS 10	14: FS, 118: FS
122	118	DSOD Review of GG Embankment 90% Design	130	26-Jul-27	21-Jan-28	117: FS	119: SS 10
123	119	GG Embankment 100% Design	125	09-Aug-27	28-Jan-28	118: SS 10	120: FS
124	120	DSOD Review of GG 100% Embankment Design Package	60	31-Jan-28	21-Apr-28	119: FS	121: FS
125	121	GG Embankment DSOD Approval Received	0	24-Apr-28		120: FS	336: FS, 337: FS, 338: FS, 339: FS
126		**Sites Dam Design**					
127		**Sites Dam Foundation and Outlet Design**					
128	124	Sites Dam Foundation and Outlet 30% Design	151	31-Aug-23	28-Mar-24*	81: FS	125: FS, 136: SS 100
129	125	Sites Dam Foundation and Outlet Design Package Submittal	0	29-Mar-24		124: FS	126: FS
130	126	DSOD Review of Sites Dam Foundation and Outlet 30% Design	130	29-Mar-24	26-Sep-24	125: FS	128: SS 10
131	127	Sites Dam Foundation and Outlet Geotech Data	0	27-Apr-26		82: FS	128: FS, 152: FS
132	128	Sites Dam Foundation and Outlet 60% Design	195	27-Apr-26	22-Jan-27	127: FS, 126: SS 10	129: FS
133	129	DSOD Review of Sites Dam Foundation and Outlet 60% Design	130	25-Jan-27	23-Jul-27	128: FS	130: SS 10
134	130	Sites Dam Foundation and Outlet 90% Design	245	08-Feb-27	14-Jan-28	129: SS 10	131: FS
135	131	DSOD Review of Sites Dam Foundation and Outlet 90% Design	130	17-Jan-28	14-Jul-28	130: FS	132: SS 10
136	132	Sites Dam Foundation and Outlet 100% Design	130	31-Jan-28	28-Jul-28	131: SS 10	133: FS
137	133	DSOD Review of Sites 100% Foundation and Outlet Design	60	31-Jul-28	20-Oct-28	132: FS	134: FS
138	134	Sites Dam Foundation and Outlet DSOD Approval Received	0	23-Oct-28		133: FS	290: FS, 296: FS
139		**Sites Dam Grouting Design**					
140	136	Sites Dam Grouting 30% Design	111	18-Jan-24	20-Jun-24*	81: FS, 124: SS 100	137: FS, 148: SS 100
141	137	Sites Dam Grouting Design Package Submittal	0	21-Jun-24		81: FS, 136: FS	138: FS
142	138	DSOD Review of Sites Dam Grouting 30% Design	130	21-Jun-24	19-Dec-24	137: FS	140: FS
143	139	Sites Dam Grouting Geotech Data	0	27-Apr-26		82: FS	140: FS
144	140	Sites Dam Grouting 60% Design	195	27-Apr-26	22-Jan-27	139: FS, 138: FS	141: FS
145	141	DSOD Review of Sites Dam Grouting 60% Design	130	25-Jan-27	23-Jul-27	140: FS	142: SS 10
146	142	Sites Dam Grouting 90% Design	245	08-Feb-27	14-Jan-28	141: SS 10	143: FS
147	143	DSOD Review of Sites Dam Grouting 90% Design	130	17-Jan-28	14-Jul-28	142: FS	144: SS 10
148	144	Sites Dam Grouting 100% Design	185	31-Jan-28	13-Oct-28	143: SS 10	145: FS
149	145	DSOD Review of Sites 100% Grouting Design Package	60	16-Oct-28	05-Jan-29	144: FS	146: FS

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Actual Level of Effort — Critical Remaining Work
Actual Work — Milestone

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#	Activity ID	Activity Name	Remaining Duration	Start	Finish	Predecessor Details	Successor Details
150	146	Sites Dam Grouting DSOD Approval Received	0	08-Jan-29		145: FS	307: FS
151	Sites Dam Embankment Design						
152	148	Sites Dam Embankment 30% Design	111	06-Jun-24	07-Nov-24*	81: FS, 136: SS 100	149: FS
153	149	Sites Dam Embankment Design Package Submittal	0	08-Nov-24		81: FS, 148: FS	150: FS
154	150	DSOD Review of Sites Dam Embankment 30% Design	130	08-Nov-24	08-May-25	149: FS	152: FS
155	151	Sites Dam Borrow and Quarry Geotech Data	0	27-Apr-26		84: FS	152: FS
156	152	Sites Dam Embankment 60% Design	195	27-Apr-26	22-Jan-27	127: FS, 151: FS, 150: FS	153: FS
157	153	DSOD Review of Sites Dam Embankment 60% Design	130	25-Jan-27	23-Jul-27	152: FS	154: SS 10
158	154	Sites Dam Embankment 90% Design	245	08-Feb-27	14-Jan-28	153: SS 10	155: FS
159	155	DSOD Review of Sites Dam Embankment 90% Design	130	17-Jan-28	14-Jul-28	154: FS	156: SS 10
160	156	Sites Dam Embankment 100% Design	185	31-Jan-28	13-Oct-28	155: SS 10	157: FS
161	157	DSOD Review of Sites 100% Embankment Design Package	60	16-Oct-28	05-Jan-29	156: FS	158: FS
162	158	Sites Dam Embankment DSOD Approval Received	0	08-Jan-29		157: FS	313: FS, 314: FS, 315: FS, 316: FS
163	Saddle Dam Designs						
164	160	Saddle Dams 30% Design	151	31-Aug-23	28-Mar-24*	81: FS	161: FS
165	161	Saddle Dams 30% Design Package Submittal	0	01-Jul-24*		160: FS	162: FS
166	162	Saddle Dams DSOD Review of 30% Design	130	01-Jul-24	27-Dec-24	161: FS	164: FS
167	163	Saddle Dams Borrow and Quarry Geotech Data	0	27-Apr-26		82: FS, 84: FS	164: FS
168	164	Saddle Dams 60% Design	180	27-Apr-26	01-Jan-27	163: FS, 162: FS	165: FS
169	165	Saddle Dams DSOD Review of 60% Design	130	04-Jan-27	02-Jul-27	164: FS	166: SS 10
170	166	Saddle Dams 90% Design	130	18-Jan-27	16-Jul-27	165: SS 10	167: FS
171	167	Saddle Dams DSOD Review of 90% Design	130	19-Jul-27	14-Jan-28	166: FS	168: SS 10
172	168	Saddle Dams 100% Design	130	02-Aug-27	28-Jan-28	167: SS 10	169: FS
173	169	DSOD Review of 100% Package	30	31-Jan-28	10-Mar-28	168: FS	170: FS
174	170	Saddle Dams DSOD Approval Received	0	13-Mar-28		169: FS	215: FS, 219: FS, 228: FS, 229: FS, 230: FS, 231: FS, 236: FS, 249: FS, 257: FS, 261: FS, 270: FS, 271: FS, 272: FS, 273: FS, 277: FS, 278: FS
175	CMAR Procurement						
176	172	Award CMAR Contract	0	01-Jan-25*		8: FS	173: FS
177	173	Notice to Proceed	30	01-Jan-25	11-Feb-25	172: FS	174: FS, 175: FS
178	174	Early Submittals And Approvals - Dams	90	12-Feb-25	17-Jun-25	173: FS	175: SS 45, 210: FS
179	175	CMAR Mobilization	120	16-Apr-25	30-Sep-25	173: FS, 174: SS 45, 27: FS, 28: FS	177: SS, 181: FS, 186: FS, 191: FS, 196: FS, 201: FS, 206: FS, 209: FS, 215: FS, 236: FS, 257: FS, 290: FS, 321: FS
180	Roads, Bridges, Access, and Site Development						
181	177	Early Site Access and Staging Development	100	16-Apr-25	02-Sep-25	175: SS	287: FS
182	Northern Construction Access Roads (CR 68, CR 69, N. Rd)						
183	179	Geotechnical Data	0	02-Jul-29		83: FS, 19: FS	180: FS
184	180	Final Design	195	02-Jul-29	29-Mar-30	179: FS	181: FS
185	181	Procurement and NTP	90	01-Apr-30	02-Aug-30	175: FS, 180: FS	182: FS

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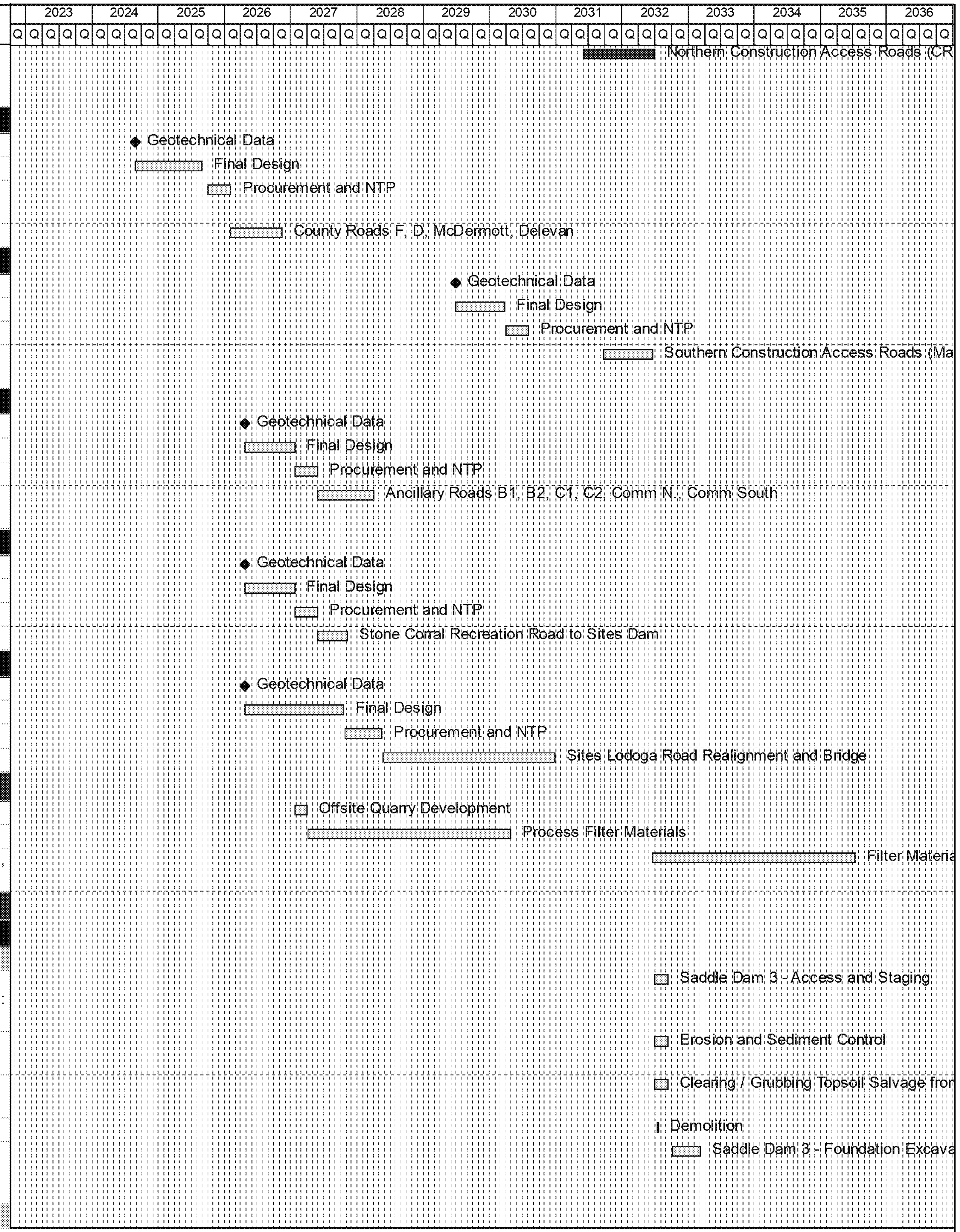
#	Activity ID	Activity Name	Remaining Duration	Start	Finish	Predecessor Details	Successor Details
186	182	Northern Construction Access Roads (CR 68, CR 69, N. Rd)	284	02-Jun-31	01-Jul-32	181: FS, 19: FS -120, 23: FS -120	215: FS, 229: FS, 236: FS, 250: FS, 271: FS, 321: FS, 337: FS
187		**County Roads F, D, McDermott, Delevan**					
188	184	Geotechnical Data	0	29-Aug-24		81: FS 260	185: FS
189	185	Final Design	260	29-Aug-24	27-Aug-25	184: FS	186: FS
190	186	Procurement and NTP	90	01-Oct-25	03-Feb-26	175: FS, 185: FS	187: FS, 229: FS, 250: FS, 271: FS
191	187	County Roads F, D, McDermott, Delevan	200	04-Feb-26	10-Nov-26	186: FS	211: FS, 321: FS
192		**Southern Construction Access Roads (Maxwell-Sites, Shoo-fly, A-1)**					
193	189	Geotechnical Data	0	02-Jul-29		83: FS, 19: FS	190: FS
194	190	Final Design	195	02-Jul-29	29-Mar-30	189: FS	191: FS
195	191	Procurement and NTP	90	01-Apr-30	02-Aug-30	175: FS, 190: FS	192: FS
196	192	Southern Construction Access Roads (Maxwell-Sites, Shoo-fly, A-1)	195	22-Sep-31	18-Jun-32	191: FS, 19: FS -120, 23: FS -40	211: FS, 290: FS, 314: FS, 337: FS
197		**Ancillary Roads B1, B2, C1, C2, Comm N., Comm South**					
198	194	Geotechnical Data	0	27-Apr-26		83: FS	195: FS
199	195	Final Design	195	27-Apr-26	22-Jan-27	194: FS	196: FS
200	196	Procurement and NTP	90	25-Jan-27	28-May-27	175: FS, 195: FS	197: FS
201	197	Ancillary Roads B1, B2, C1, C2, Comm N., Comm South	220	31-May-27	31-Mar-28	196: FS	342: FS
202		**Stone Corral Recreation Road to Sites Dam**					
203	199	Geotechnical Data	0	27-Apr-26		83: FS	200: FS
204	200	Final Design	195	27-Apr-26	22-Jan-27	199: FS	201: FS
205	201	Procurement and NTP	90	25-Jan-27	28-May-27	175: FS, 200: FS	202: FS
206	202	Stone Corral Recreation Road to Sites Dam	120	31-May-27	12-Nov-27	201: FS	342: FS
207		**Sites Lodoga Road Realignment and Bridge**					
208	204	Geotechnical Data	0	27-Apr-26		83: FS	205: FS
209	205	Final Design	390	27-Apr-26	22-Oct-27	204: FS	206: FS
210	206	Procurement and NTP	150	25-Oct-27	19-May-28	175: FS, 205: FS	207: FS
211	207	Sites Lodoga Road Realignment and Bridge	680	22-May-28	27-Dec-30	206: FS	342: FS
212		**Process and Haul Filter Materials to Project**					
213	209	Offsite Quarry Development	50	25-Jan-27	02-Apr-27	81: FS, 115: FS, 175: F	210: FS
214	210	Process Filter Materials	800	05-Apr-27	26-Apr-30	174: FS, 209: FS	211: SS 30
215	211	Filter Material Haul to Stockpile	800	21-Jun-32	13-Jul-35	210: SS 30, 187: FS, 192: FS	229: SS 30, 250: SS 30, 314: SS 30, 337: SS 30
216		**Saddle Dams Construction**					
217		**Saddle Dam 3**					
218		**Saddle Dam 3 Foundation Excavation**					
219	215	Saddle Dam 3 - Access and Staging	50	02-Jul-32	09-Sep-32	170: FS, 175: FS, 182: FS	216: SS, 217: SS, 218: SS 10, 219: SS 20, 226: FS, 227: FS
220	216	Erosion and Sediment Control	50	02-Jul-32	09-Sep-32	215: SS	219: SS 20, 226: FS, 227: FS
221	217	Clearing / Grubbing Topsoil Salvage from Work Areas	50	02-Jul-32	09-Sep-32	215: SS	219: FS 20, 226: FS, 227: FS
222	218	Demolition	5	16-Jul-32	22-Jul-32	215: SS 10	219: SS 20
223	219	Saddle Dam 3 - Foundation Excavation (Dbl Shift)	110	08-Oct-32	10-Mar-33	215: SS 20, 216: SS 20, 217: FS 20, 218: SS 20, 170: FS	221: FF 15, 222: FF 20
224		**Saddle Dam 3 - Foundation Preparation and Grouting**					



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#	Activity ID	Activity Name	Remaining Duration	Start	Finish	Predecessor Details	Successor Details
225	221	Foundation Cleaning	100	12-Nov-32	31-Mar-33	219: FF 15	222: SS 10
226	222	Dental Excavation and Concrete	50	28-Jan-33	07-Apr-33	219: FF 20, 221: SS 10	223: SS 20
227	223	Grout Cap	80	25-Feb-33	16-Jun-33	222: SS 20	224: SS 10
228	224	Curtain Grouting	90	11-Mar-33	14-Jul-33	223: SS 10	228: SS 60
229		**Saddle Dam 3 - Embankment**					
230	226	Initial Borrow Development (Core Material)	40	10-Sep-32	04-Nov-32	215: FS, 216: FS, 217: FS	228: SS 20
231	227	Initial Borrow Development for Zones 3 and 4	100	10-Sep-32	27-Jan-33	215: FS, 216: FS, 217: FS	230: FS, 231: FS
232	228	Place Zone 1 - Core	260	03-Jun-33	01-Jun-34	226: SS 20, 224: SS 60, 170: FS	229: SS
233	229	Place Zone 2A & 2B - Filters, Drains and Transitions	260	03-Jun-33	01-Jun-34	228: SS, 182: FS, 186: FS, 170: FS, 211: SS 30	230: SS
234	230	Place Zone 3 - Rockfill	260	03-Jun-33	01-Jun-34	229: SS, 227: FS, 170: FS	231: SS
235	231	Place Zone 4 - Random	260	03-Jun-33	01-Jun-34	230: SS, 227: FS, 170: FS	232: FF 15
236	232	Place Rip Rap	200	16-Sep-33	22-Jun-34	231: FF 15	233: FF 20
237	233	Site Reclamation and Topsoil Replacement	60	28-Apr-34	20-Jul-34	232: FF 20	342: FS
238		**Saddle Dam 5**					
239		**Saddle Dam 5 - Foundation Excavation**					
240	236	Saddle Dam 5 - Access and Staging	30	02-Jul-32	12-Aug-32	170: FS, 175: FS, 182: FS	237: SS, 238: SS, 239: SS 10, 240: SS 20, 247: FS, 248: FS
241	237	Erosion and Sediment Control	30	02-Jul-32	12-Aug-32	236: SS	240: SS 20
242	238	Clearing / Grubbing Topsoil Salvage from Work Are	30	02-Jul-32	12-Aug-32	236: SS	240: SS 20
243	239	Demolition	5	16-Jul-32	22-Jul-32	236: SS 10	240: FS
244	240	Saddle Dam 5 - Foundation Excavation	50	30-Jul-32	07-Oct-32	236: SS 20, 237: SS 20, 238: SS 20, 239: FS, 98: FS	242: FF 15, 243: FF 15
245		**Saddle Dam 5 - Foundation Preparation and Grouting**					
246	242	Foundation Cleaning	60	06-Aug-32	28-Oct-32	240: FF 15	243: SS 10
247	243	Dental Excavation and Concrete	60	20-Aug-32	11-Nov-32	240: FF 15, 242: SS 10	244: SS 20
248	244	Grout Cap	40	17-Sep-32	11-Nov-32	243: SS 20	245: SS 10
249	245	Curtain Grouting	70	01-Oct-32	06-Jan-33	244: SS 10	249: SS 60
250		**Saddle Dam 5 - Embankment**					
251	247	Initial Borrow Development (Core Material)	40	13-Aug-32	07-Oct-32	236: FS	249: SS 20
252	248	Initial Borrow Development for Zones 3 and 4	100	13-Aug-32	30-Dec-32	236: FS	251: FS
253	249	Place Zone 1 - Core	100	24-Dec-32	12-May-33	245: SS 60, 247: SS 20, 170: FS	250: SS
254	250	Place Zone 2A & 2B - Filters, Drains and Transitions	100	24-Dec-32	12-May-33	249: SS, 182: FS, 186: FS, 211: SS 30	251: SS
255	251	Place Zone 3 - Rockfill	100	31-Dec-32	19-May-33	250: SS, 248: FS	252: SS
256	252	Place Zone 4 - Random	100	31-Dec-32	19-May-33	251: SS	253: FF 15
257	253	Place Rip Rap	70	04-Mar-33	09-Jun-33	252: FF 15	254: FF 20
258	254	Site Reclamation and Topsoil Replacement	60	15-Apr-33	07-Jul-33	253: FF 20	342: FS
259		**Minor Saddle Dams (SD1,SD2,SD6,SD8A, Dike 1, and Dike 2)**					
260		**Minor Saddle Dams Foundation Excavation**					
261	257	Minor Saddle Dams - Access and Staging	30	13-Mar-28	21-Apr-28	170: FS, 175: FS	258: SS, 259: SS, 260: SS 10, 261: SS 20, 268: FS, 269: FS, 277: FS, 278: FS

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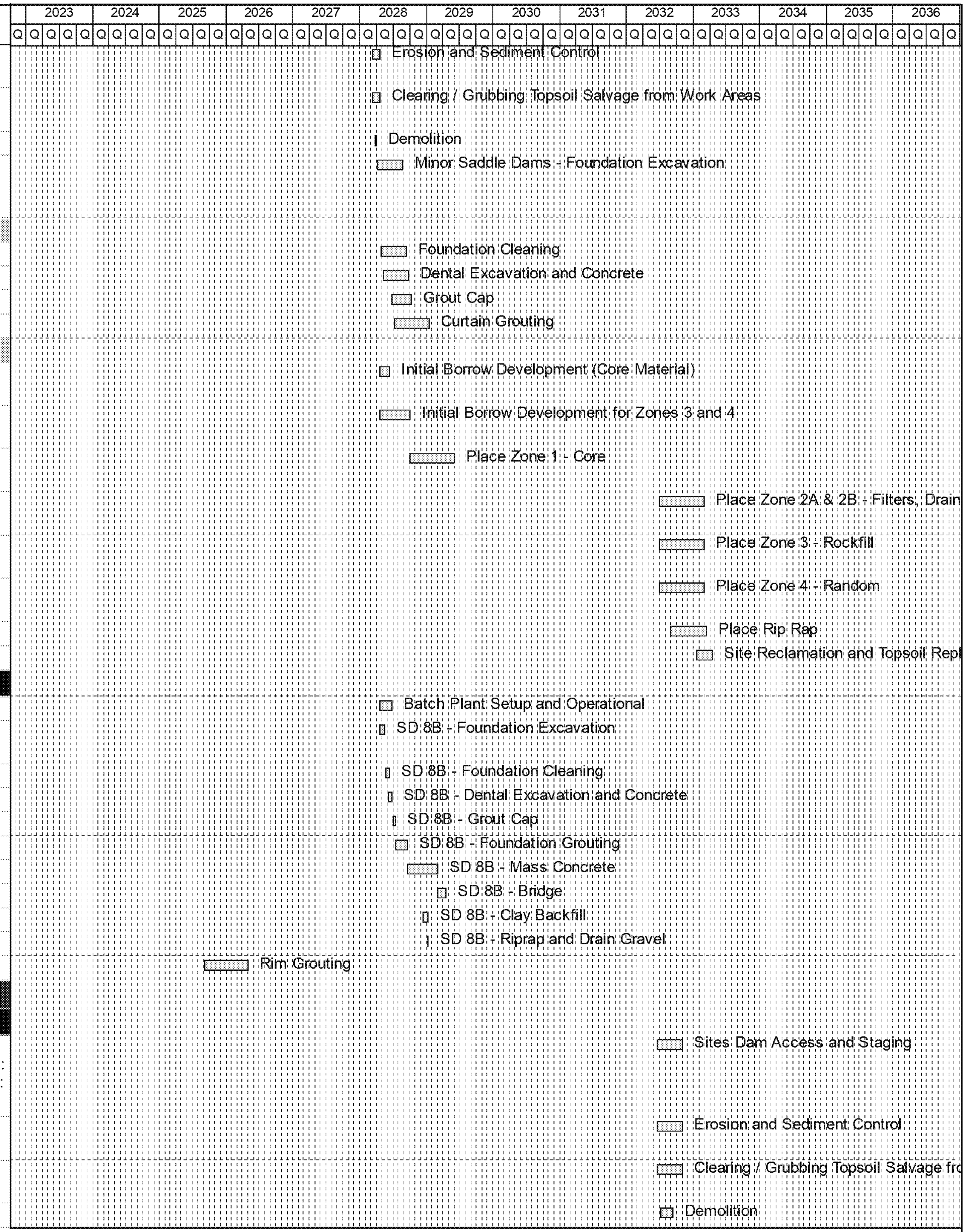
262	258	Erosion and Sediment Control	30	13-Mar-28	21-Apr-28	257: SS	261: SS 20, 268: FS, 269: FS, 278: FS
263	259	Clearing / Grubbing Topsoil Salvage from Work Areas	30	13-Mar-28	21-Apr-28	257: SS	261: SS 20, 268: FS, 269: FS, 278: FS
264	260	Demolition	5	27-Mar-28	31-Mar-28	257: SS 10	261: FS
265	261	Minor Saddle Dams - Foundation Excavation	100	10-Apr-28	25-Aug-28	257: SS 20, 258: SS 20, 259: SS 20, 260: FS, 170: FS	263: FF 15, 264: FF 20
266		**Minor Saddle Dams - Foundation Preparation and Grouting**					
267	263	Foundation Cleaning	100	01-May-28	15-Sep-28	261: FF 15	264: SS 10
268	264	Dental Excavation and Concrete	100	15-May-28	29-Sep-28	261: FF 20, 263: SS 10	265: SS 30
269	265	Grout Cap	80	26-Jun-28	13-Oct-28	264: SS 30	266: SS 10
270	266	Curtain Grouting	140	10-Jul-28	19-Jan-29	265: SS 10	270: SS 60
271		**Minor Saddle Dams - Embankment**					
272	268	Initial Borrow Development (Core Material)	40	24-Apr-28	16-Jun-28	257: FS, 258: FS, 259: FS	270: SS 20
273	269	Initial Borrow Development for Zones 3 and 4	120	24-Apr-28	06-Oct-28	257: FS, 258: FS, 259: FS	272: FS, 273: FS
274	270	Place Zone 1 - Core	175	02-Oct-28	01-Jun-29	266: SS 60, 268: SS 20, 170: FS	271: SS
275	271	Place Zone 2A & 2B - Filters, Drains and Transitions	175	02-Jul-32	03-Mar-33	270: SS, 182: FS, 186: FS, 170: FS	272: SS
276	272	Place Zone 3 - Rockfill	175	02-Jul-32	03-Mar-33	271: SS, 170: FS, 269: FS	273: SS
277	273	Place Zone 4 - Random	175	02-Jul-32	03-Mar-33	272: SS, 170: FS, 269: FS	274: FF 10
278	274	Place Rip Rap	145	27-Aug-32	17-Mar-33	273: FF 10	275: FF 20
279	275	Site Reclamation and Topsoil Replacement	60	21-Jan-33	14-Apr-33	274: FF 20	342: FS
280		**Saddle Dam 8B - Spillway**					
281	277	Batch Plant Setup and Operational	50	24-Apr-28	30-Jun-28	257: FS, 170: FS	281: FS
282	278	SD 8B - Foundation Excavation	20	24-Apr-28	19-May-28	257: FS, 258: FS, 259: FS, 170: FS	279: FS
283	279	SD 8B - Foundation Cleaning	20	22-May-28	16-Jun-28	278: FS	280: SS 10
284	280	SD 8B - Dental Excavation and Concrete	20	05-Jun-28	30-Jun-28	279: SS 10	281: FS
285	281	SD 8B - Grout Cap	12	03-Jul-28	18-Jul-28	280: FS, 277: FS	282: FS
286	282	SD 8B - Foundation Grouting	45	19-Jul-28	19-Sep-28	281: FS	283: FS
287	283	SD 8B - Mass Concrete	120	20-Sep-28	06-Mar-29	282: FS	284: FS, 285: SS 60
288	284	SD 8B - Bridge	30	07-Mar-29	17-Apr-29	283: FS	342: FS
289	285	SD 8B - Clay Backfill	20	13-Dec-28	09-Jan-29	283: SS 60	286: FS
290	286	SD 8B - Riprap and Drain Gravel	3	10-Jan-29	12-Jan-29	285: FS	342: FS
291	287	Rim Grouting	171	03-Sep-25	29-Apr-26	177: FS	342: FS
292		**Sites Dam Construction**					
293		**Sites Dam Foundation Excavation**					
294	290	Sites Dam Access and Staging	100	21-Jun-32	05-Nov-32	192: FS, 134: FS, 175: FS	291: SS, 292: SS, 293: SS 10, 294: SS 20, 296: SS 15, 298: SS 15, 311: FS, 312: FS
295	291	Erosion and Sediment Control	100	21-Jun-32	05-Nov-32	290: SS	294: SS 20, 311: FS, 312: FS
296	292	Clearing / Grubbing Topsoil Salvage from Work Areas	100	21-Jun-32	05-Nov-32	290: SS	294: SS 20, 311: FS, 312: FS
297	293	Demolition	50	05-Jul-32	10-Sep-32	290: SS 10	294: SS 20



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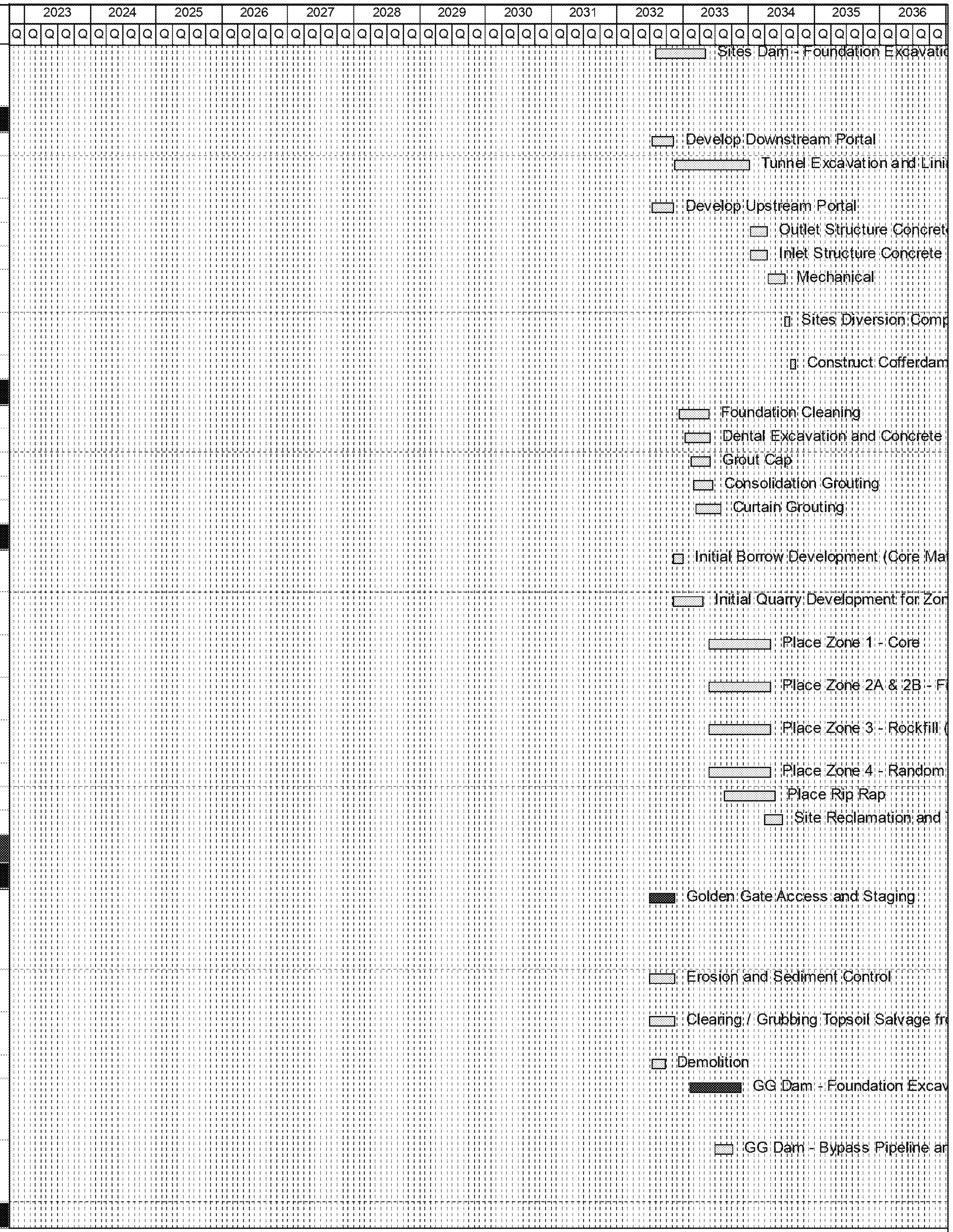
298	294	Sites Dam - Foundation Excavation	200	02-Aug-32	06-May-33	290: SS 20, 291: SS 20, 292: SS 20, 293: SS 20, 98: FS	303: SS 30, 305: FF 15, 306: FF 20
299		**Sites Diversion Outlet Facility**					
300	296	Develop Downstream Portal	90	12-Jul-32	12-Nov-32	290: SS 15, 134: FS	297: FS
301	297	Tunnel Excavation and Lining - Double Shift	300	15-Nov-32	06-Jan-34	296: FS	299: FS, 300: FS, 301: FS
302	298	Develop Upstream Portal	90	12-Jul-32	12-Nov-32	290: SS 15	300: FS
303	299	Outlet Structure Concrete	70	09-Jan-34	14-Apr-34	297: FS	301: FS, 302: FS
304	300	Inlet Structure Concrete	70	09-Jan-34	14-Apr-34	297: FS, 298: FS	301: FS, 302: FS
305	301	Mechanical	70	17-Apr-34	21-Jul-34	297: FS, 299: FS, 300: FS	302: FS
306	302	Sites Diversion Completion and Restoration	20	24-Jul-34	18-Aug-34	299: FS, 300: FS, 301: FS	303: FS
307	303	Construct Cofferdam to El. 310	20	21-Aug-34	15-Sep-34	294: SS 30, 302: FS	
308		**Sites Dam - Foundation Preparation and Grouting**					
309	305	Foundation Cleaning	120	13-Dec-32	27-May-33	294: FF 15	
310	306	Dental Excavation and Concrete	100	17-Jan-33	03-Jun-33	294: FF 20	307: SS 20
311	307	Grout Cap	80	14-Feb-33	03-Jun-33	306: SS 20, 146: FS	308: SS 10
312	308	Consolidation Grouting	80	28-Feb-33	17-Jun-33	307: SS 10	309: SS 10
313	309	Curtain Grouting	100	14-Mar-33	29-Jul-33	308: SS 10	313: SS 50
314		**Sites Dam - Embankment**					
315	311	Initial Borrow Development (Core Material)	40	08-Nov-32	31-Dec-32	290: FS, 291: FS, 292: FS	313: SS 20
316	312	Initial Quarry Development for Zones 3 and 4	120	08-Nov-32	22-Apr-33	290: FS, 291: FS, 292: FS	315: SS 40
317	313	Place Zone 1 - Core	250	23-May-33	05-May-34	311: SS 20, 309: SS 50, 158: FS	314: SS
318	314	Place Zone 2A & 2B - Filters, Drains and Transitions	250	23-May-33	05-May-34	313: SS, 192: FS, 158: FS, 211: SS 30	315: SS
319	315	Place Zone 3 - Rockfill (Some Dbl Shift)	250	23-May-33	05-May-34	314: SS, 312: SS 40, 158: FS	316: SS
320	316	Place Zone 4 - Random (Some Dbl Shift)	250	23-May-33	05-May-34	315: SS, 158: FS	317: FF 15
321	317	Place Rip Rap	200	22-Aug-33	26-May-34	316: FF 15	318: FF 30
322	318	Site Reclamation and Topsoil Replacement	70	03-Apr-34	07-Jul-34	317: FF 30	342: FS
323		**Golden Gate Dam Construction**					
324		**GG Dam Foundation Excavation**					
325	321	Golden Gate Access and Staging	100	02-Jul-32	18-Nov-32	175: FS, 98: FS, 57: FS, 66: FS, 68: FS, 71: FS, 44: FS, 187: FS, 182: FS	79: FS, 322: SS, 323: SS, 324: SS 10, 325: SS 20, 326: SS 100, 334: FS, 335: FS
326	322	Erosion and Sediment Control	100	02-Jul-32	18-Nov-32	321: SS	325: SS 20, 326: SS 100, 334: FS, 335: FS
327	323	Clearing / Grubbing Topsoil Salvage from Work Areas	100	02-Jul-32	18-Nov-32	321: SS	325: SS 20, 326: SS 100, 334: FS, 335: FS
328	324	Demolition	50	16-Jul-32	23-Sep-32	321: SS 10	325: SS 20, 326: SS 1(
329	325	GG Dam - Foundation Excavation (Some Dbl Shift)	200	11-Feb-33	17-Nov-33	321: SS 20, 322: SS 20, 323: SS 20, 324: SS 20, 98: FS, 79: FF	326: SS 100, 328: FF 15, 329: FF 20
330	326	GG Dam - Bypass Pipeline and U/S Cofferdam	70	01-Jul-33	06-Oct-33	321: SS 100, 322: SS 100, 323: SS 100, 324: SS 100, 325: SS 100	336: FS
331		**GG Dam - Foundation Preparation and Grouting**					



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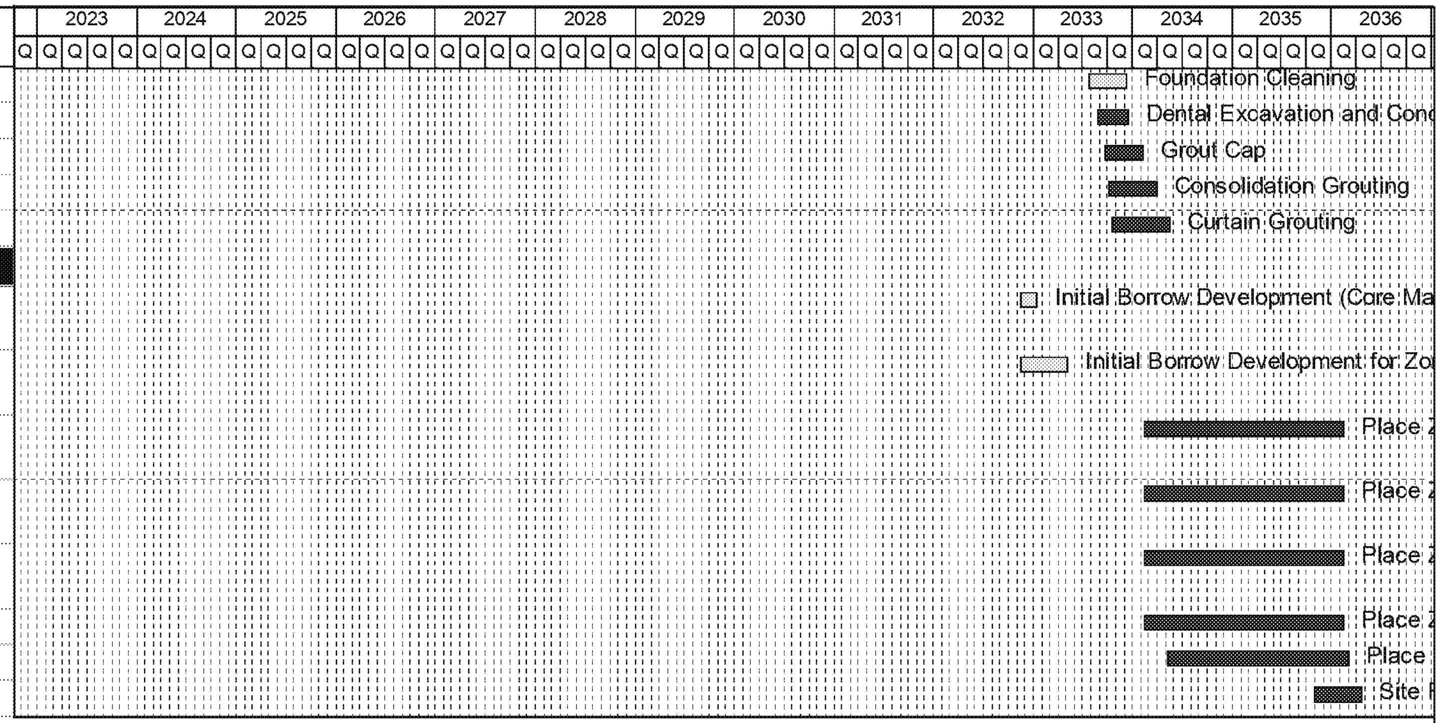
332	328	Foundation Cleaning	100	22-Jul-33	08-Dec-33	325: FF 15	329: SS 10
333	329	Dental Excavation and Concrete	80	26-Aug-33	15-Dec-33	325: FF 20, 328: SS 10	330: SS 20
334	330	Grout Cap	100	23-Sep-33	09-Feb-34	329: SS 20, 109: FS	331: SS 10
335	331	Consolidation Grouting	125	07-Oct-33	30-Mar-34	330: SS 10	332: SS 10
336	332	Curtain Grouting	150	21-Oct-33	18-May-34	331: SS 10	336: SS 80
337	**GG Dam - Embankment**						
338	334	Initial Borrow Development (Core Material)	40	19-Nov-32	13-Jan-33	321: FS, 322: FS, 323: FS	336: SS 20
339	335	Initial Borrow Development for Zones 3 and 4	120	19-Nov-32	05-May-33	321: FS, 322: FS, 323: FS	338: SS 40
340	336	Place Zone 1 - Core	525	10-Feb-34	14-Feb-36	334: SS 20, 332: SS 80, 121: FS, 326: FS	337: SS
341	337	Place Zone 2A & 2B - Filters, Drains and Transitions	525	10-Feb-34	14-Feb-36	336: SS, 192: FS, 182: FS, 121: FS, 211: SS 30	338: SS
342	338	Place Zone 3 - Rockfill (Some Dbl Shift)	525	10-Feb-34	14-Feb-36	337: SS, 335: SS 40, 121: FS	339: SS
343	339	Place Zone 4 - Random (Some Dbl Shift)	525	10-Feb-34	14-Feb-36	338: SS, 121: FS	340: FF 15
344	340	Place Rip Rap	475	12-May-34	06-Mar-36	339: FF 15	341: FF 30
345	341	Site Reclamation and Topsoil Replacement	120	02-Nov-35	17-Apr-36	340: FF 30	342: FS



Remaining Level of Effort
Actual Level of Effort
Actual Work
Remaining Work
Critical Remaining Work
Milestone

Project ID: CP1 Version 3 / Project Name: Sites Reservoir Dams Construction - rev 6 11-09-20
Layout Name: Sites WBS w/ Pred Succ / TASK filter: Less than 100%.
Data Date: 04-Oct-22 / Print Date: 30-Jan-23

From: Spranza, John [John.Spranza@hdrinc.com]
Sent: 1/30/2023 10:17:25 AM
To: Berryman, Ellen [Ellen.Berryman@icf.com]
CC: Alicia Forsythe [aforsythe@sitesproject.org]; Arsenijevic, Jelica [jelica.arsenijevic@hdrinc.com]; Briard, Monique (Monique.Briard@icfi.com) [Monique.Briard@icfi.com]; Olden, Randy [randall.olden@hdrinc.com]; Risse, Danielle [danielle.risse@hdrinc.com]; Edwards, Dawn [Dawn.Edwards@hdrinc.com]; Lloyd, John [John.Lloyd@hdrinc.com]; Luu, Henry [henry.luu@hdrinc.com]; Conner McDonald [conner@cmdwest.com]
Subject: RE: Sites - revising inundation area to 498 elevation contour generated by Lidar.

Ellen,
This is consistent with our discussion and my direction on the pathway forward until we receive additional direction from the Authority. Thanks for sending this summary over.
John

John Spranza

D 916.679.8858 M 818.640.2487

From: Berryman, Ellen <Ellen.Berryman@icf.com>
Sent: Monday, January 23, 2023 3:32 PM
To: Spranza, John <John.Spranza@hdrinc.com>
Subject: Sites - revising inundation area to 498 elevation contour generated by Lidar.

Hi John,
Per our discussion today with you and Debbie, we have developed a work-around that would allow us to meet the January 31 deadline for the revised ITP application even though we're missing engineering details. As we discussed this morning, we know that engineering is in progress and details will change, therefore permit amendments will be needed and it is not necessary to be excessively precise in our impact calculations. As such, our impact estimates for the revised application will be based on a new footprint, using the 498 elevation contour generated by Lidar for the inundation area, with the following items that may or may not need to be updated:

- Realign portions of Sites Lodoga road using the EIR version of the road (Alt 1 v1) to avoid overlap with the new inundation area (this will give us a pre-generated alignment that will help us calculate impacts – the alignment will not be shown on any maps or figures).
- Realign portions of Saddle Dam South access road and South/Huffmaster roads to avoid overlap with new inundation area. ICF GIS will make these edits on an adhoc basis since engineering drawings are not available.
- The Golden Gate and Sites dam footprints will not be revised.
- We are not to include the following polygons that are included in the construction years data layers:
    - Quarry/borrow area northeast of Sites Dam
    - Transmission line that heads south from TRR West
    - Sutton/Lenshan/Wadleigh roads and portions of Maxwell Sites Road/Old Hwy 99 W
- Other minor overlaps/gaps between the Lidar-generated 498 elevation contour/construction years data layers and the Alt 1 v3 inundation area/impact footprint will be disregarded.
- For figures:
    - We will not generate any detailed project figures but will provide CDFW with updated KMZ or GIS data when available.
    - The existing figures will be used as schematics and will not be revised.
    - We will create one new figure that shows impact by year.

We're seeking concurrence from the Authority with this new approach as soon as possible so that we can complete the revised application prior to the Jan 31 deadline.
Thanks!
Ellen

From: Turner, Debbie <Debbie.Turner@icf.com>
Sent: Monday, January 23, 2023 2:32 PM
To: Berryman, Ellen <Ellen.Berryman@icf.com>
Subject: Sites - revising inundation area to 498 elevation contour generated by Lidar.

Hi Ellen,

Per our discussion today with John, the following are the items that may or may not need to be updated in the new impact footprint that will use the 498 elevation contour generated by Lidar for the inundation area.

- Realign portions of Sites Lodoga road using the EIR version of the road (Alt 1 v1) to avoid overlap with the new inundation area.
- Realign portions of Saddle Dam South access road and South/Huffmaster roads to avoid overlap with new inundation area. ICF GIS will make these edits on an adhoc basis since engineering drawings are not available.
- The Golden Gate and Sites dam footprints will not be revised.
- We are not to include the following polygons that are included in the construction years data layers:
  - Quarry/borrow area northeast of Sites Dam
  - Transmission line that heads south from TRR West
  - Sutton/Lenshan/Wadleigh roads and portions of Maxwell Sites Road/Old Hwy 99 W

Other minor overlaps/gaps between the Lidar-generated 498 elevation contour/construction years data layers and the Alt 1 v3 inundation area/impact footprint will be disregarded.

Debbie

Debbie Turner | Conservation GIS Analyst | 858.444.3927 (primary phone) | 619.417.4277 (mobile)
Work Schedule: Monday through Thursday 7 am to 3 pm PST
| debbie.turner@icf.com
ICF50 | 525 B Street, Suite 1700, San Diego, CA 92101 USA | icf.com

From: Marcia Kivett [MKivett@sitesproject.org]
Sent: 1/30/2023 10:40:48 AM
To: Huynh, Greg [Gregory.Huynh@ladwp.com]; rrencher@parsonsbehle.com; Jerry Brown [jbrown@sitesproject.org]; JP Robinette [jrobinette@sitesproject.org]; Kevin Spesert [kspesert@sitesproject.org]

Subject: Intermountain Power Project Governance
Attachments: IPP Questions.docx

Start: 2/9/2023 9:00:00 AM
End: 2/9/2023 10:00:00 AM
Show Time As: Busy

Recurrence: (none)

Required Attendees: Huynh, Greg; rrencher@parsonsbehle.com; Jerry Brown; JP Robinette; Kevin Spesert

Good Morning, Please see the attached document for this meeting. Thank you.

Thanks Greg – By way of this note my Assistant Marcia Kivett will be reaching out to you and Ron to get a meeting set up. We very much appreciate both of your time and willingness to share your experiences and perspectives with us. Looking forward to our discussion.

Jerry

From: "Huynh, Greg" <Gregory.Huynh@ladwp.com>
Date: Thursday, January 26, 2023 at 2:27 PM
To: Jerry Brown <jbrown@sitesproject.org>
Cc: "Ronald L. Rencher (RRencher@parsonsbehle.com)" <RRencher@parsonsbehle.com>
Subject: Intermountain Power Project Governance

Mr. Brown,

Thank you for speaking with me yesterday about your inquiry to LADWP's General Manager. As stated in our conversation, I am sending you our current Construction Management & Operating Agreement between LADWP and the Intermountain Power Agency (IPA). This is the document that allows LADWP to act as the operating agent for IPA. Also in our conversation, I stated that it has been difficult to find the 1978 DWP staff report, but we will continue to look. In the meantime, I would like to introduce you to IPP's legal counsel, Mr. Ron Rencher. He was been with the project from the very beginning and can provide valuable insight into the formation of IPP and IPA. I have asked Mr. Rencher to be available for a discussion with you about the early days of IPP. Please let me know when you're available and I facilitate a meeting for us.

Regards,

Gregory S. Huynh | Operating Agent Manager
Los Angeles Department of Water and Power
Power External Energy Resources - Generation Projects
111 N. Hope St, Room 1255
Los Angeles CA, 90012
Office: (213) 367-3438
Mobile: (213) 944-2770
E-mail: greg.huynh@ladwp.com

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We are immensely grateful to both of you for making time available to 3 Senior Managers from the Sites Reservoir Project to discuss your perspectives and lessons learned on the Intermountain Power Project.

To help you understand the project and what topics we are most interested in discussing with you, we have prepared this one-page backgrounder and a list of questions we have about the IPP that would help us in formulating our plans for Sites.

The Senior Managers attending the meeting have researched the IPP. They have read many of the publications and documents publicly available that explain the past development and the current redevelopment of the project. We want to make use of your valuable time to get at some of the nuances and subtleties which may not be as not apparent in public documents.

BACKGROUND

- Sites is a locally led, locally supported surface water storage project located in Northern California. The off-takers are 22 water districts across California (ag/urban, inland/coastal, north/south), plus the federal and state government.
- About 75% of off-takers are located south of the delta.
- A JPA of local Sac Valley districts was formed to stand up the project and is currently envisioned as the owner/operator of the project. A "reservoir committee" comprising the 22 off-takers currently advises the JPA's business activities and has very limited decision-making authority.
- The nearest town to the project site is Maxwell, Ca, a rural community (pop ~200) about 60 miles north of Sacramento.
- The current project cost estimate is approx. $4B.
- The local cost portion will be mainly supported through an EPA WIFIA loan which allows pooled credit at a minimum investment grade rating.

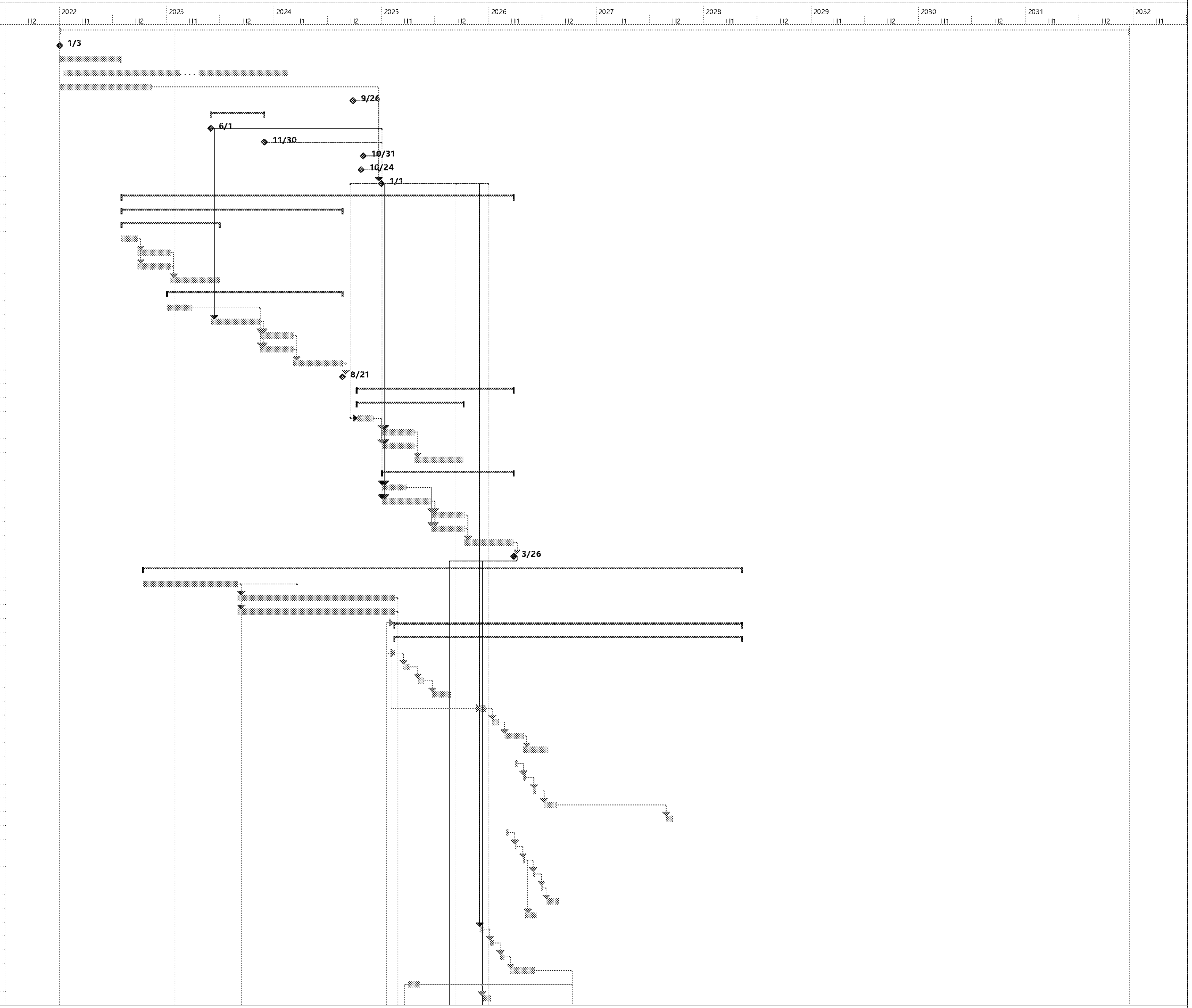
Areas of Interest

1. **Governance** – The 22 water districts paying for the project feel they need to have more control over expenditures and risks and would like to change the governance to allow for more of their control over the project**. How did IPP navigate these 'growing pains of change' and what were the key elements to the project's successes in this regard?**

2. **Local Impact Alleviation** - Maxwell and its surroundings are much like Delta, Utah. Challenges with "Big Project/Small Town" are top of mind for officials and citizens in the area. **Are there foundational values or positions that the IPP proponents established and built into the culture of the organization and dealings with the community that contributed meaningfully to successfully addressing issues (ie securing state/federal grants, negotiating disputes, getting Coor Cmte approval, long-term/ongoing public services staffing costs)?**

3. **Project Financing** - Sites will be a pooled credit among the 22 water districts with the JPA acting as the financing authority, similar to how the IPA acts on behalf of the IPP purchasers. **Through your operating experience of original debt repayment and refinancings for the current redevelopment, are there any lessons learned that Sites should be mindful of in our establishing benefits and obligation commitments for off-takers?**

ID	Task Name	Duration	Start	Finish	Predecessors
0	**Maxwell Sites Pumping and Generating Facilities CP2**	**2599 days?**	**Mon 1/3/22**	**Thu 12/18/3**	
1	Start Task Order 3 - Preliminary Engineering	0 days	Mon 1/3/22	Mon 1/3/22	
2	Determine Construction Packaging & Delivery Methods	149 days	Mon 1/3/22	Thu 7/28/22	
3	Real Estate Team Gain Access for Surveying & Geotech Investigation	500 days	Mon 1/17/22	Fri 2/16/24	
4	Topographic Survey and Mapping	225 days	Mon 1/3/22	Fri 11/11/22	
5	Water Rights Permit Issued	0 days	Thu 9/26/24	Thu 9/26/24	
6	**Final EIR / EIS**	**130 days**	**Thu 6/1/23**	**Thu 11/30/23**	
7	Final EIR CEQA Adoption	0 days	Thu 6/1/23	Thu 6/1/23	
8	Final EIS NEPA ROD	0 days	Thu 11/30/23	Thu 11/30/23	
9	WIFEA EPA Loan Closed	0 days	Thu 10/31/24	Thu 10/31/24	
10	Investor Commitment	0 days	Thu 10/24/24	Thu 10/24/24	
11	NTP for 60% Design Activities	0 days	Wed 1/1/25	Wed 1/1/25	4,5,9,10,7
12	**Geotech Investigations MSPG Investigations**	**954 days**	**Mon 8/1/22**	**Thu 3/26/26**	
13	**Phase 1 Geotech investigation for Preliminary (30%) Design**	**538 days**	**Mon 8/1/22**	**Wed 8/21/24**	
14	**Federal Access (USBR)**	**240 days**	**Mon 8/1/22**	**Fri 6/30/23**	
15	Right of Entry, Negotiated	2 mons	Mon 8/1/22	Fri 9/23/22	
16	Environmental Survey, Report Prep & Clearance	4 mons	Mon 9/26/22	Fri 1/13/23	15
17	Cultural Survey Report Prep and Clearance	4 mons	Mon 9/26/22	Fri 1/13/23	15
18	Geotechnical Field Investigation and Report	6 mons	Mon 1/16/23	Fri 6/30/23	16,17
19	**Private Access**	**427 days**	**Tue 1/3/23**	**Wed 8/21/24**	
20	Right of Entry Negotiated	3 mons	Tue 1/3/23	Mon 3/27/23	
21	Right of Entry Court Ordered	6 mons	Thu 6/1/23	Wed 11/15/23	7
22	Environmental Survey, Report Prep & Clearance	4 mons	Thu 11/16/23	Wed 3/6/24	20,21
23	Cultural Survey Report Prep and Clearance	4 mons	Thu 11/16/23	Wed 3/6/24	20,21
24	Geotechnical Field Investigation and Report	6 mons	Thu 3/7/24	Wed 8/21/24	22,23
25	P1 Geotechnical Investigation Complete	0 days	Wed 8/21/24	Wed 8/21/24	24
26	**Phase 2 Geotech Investigation for All MSPG Design**	**382 days**	**Wed 10/9/24**	**Thu 3/26/26**	
27	**Federal Access (USBR)**	**260 days**	**Wed 10/9/24**	**Tue 10/7/25**	
28	Right of Entry, Negotiated	2 mons	Wed 10/9/24	Tue 12/3/24	11SS-60 days
29	Environmental Survey, Report Prep & Clearance	4 mons	Wed 1/1/25	Tue 4/22/25	28,11
30	Cultural Survey Report Prep and Clearance	4 mons	Wed 1/1/25	Tue 4/22/25	28,11
31	Geotechnical Field Investigation and Report	6 mons	Wed 4/23/25	Tue 10/7/25	29,30
32	**Private Access**	**320 days**	**Fri 1/3/25**	**Thu 3/26/26**	
33	Right of Entry Negotiated	3 mons	Fri 1/3/25	Thu 3/27/25	11,7,8
34	Right of Entry Court Ordered	6 mons	Fri 1/3/25	Thu 6/19/25	11,7
35	Environmental Survey, Report Prep & Clearance	4 mons	Fri 6/20/25	Thu 10/9/25	33,34
36	Cultural Survey Report Prep and Clearance	4 mons	Fri 6/20/25	Thu 10/9/25	33,34
37	Geotechnical Field Investigation and Report	6 mons	Fri 10/10/25	Thu 3/26/26	35,36
38	P2 Geotechnical Investigation Complete	0 days	Thu 3/26/26	Thu 3/26/26	37
39	**IO Tunnel and Tower Geotechnical Investigations**	**1455 days?**	**Fri 10/14/22**	**Thu 5/11/28**	
40	P1 Geotech Investigation (30% Cutoff)	230 days	Fri 10/14/22	Thu 8/31/23	
41	P2a Geotech Investigation (Dam Foundations & Grouting)(and I-O)	76 wks	Fri 9/1/23	Thu 2/13/25	40
42	P2a Geotech Investigation (Roads)	76 wks	Fri 9/1/23	Thu 2/13/25	40
43	**Permitting**	**845 days?**	**Fri 2/14/25**	**Thu 5/11/28**	**101SS**
44	**Baseline Surveys and Revised ESA Consultation**	**845 days?**	**Fri 2/14/25**	**Thu 5/11/28**	
45	Access Granted for Biological Surveys	1 day	Fri 2/14/25	Fri 2/14/25	101SS
46	Plant Survey 1	15 days	Mon 3/17/25	Fri 4/4/25	45FS+7 days
47	Plant Survey 2	15 days	Mon 5/5/25	Fri 5/23/25	46FS+20 days
48	Plant Survey 3 and Report	45 days	Mon 6/23/25	Fri 8/22/25	47FS+20 days
49	Land Cover Verification/Aquatic Delineation #1	15 days	Tue 12/2/25	Mon 12/22/25	45SS
50	Land Cover Verification/Aquatic Delineation #2	15 days	Tue 1/13/26	Mon 2/2/26	49FS+15 days
51	Land Cover Verification/Aquatic Delineation and Report	45 days	Tue 2/24/26	Mon 4/27/26	50FS+15 days
52	Revise Impact Acers and Work with Agendas	60 days	Tue 4/28/26	Mon 7/20/26	51
53	BUOW #1	5 days	Wed 4/1/26	Tue 4/7/26	
54	BUOW #2	5 days	Wed 4/29/26	Tue 5/5/26	53FS+15 days
55	BUOW #3	5 days	Wed 6/3/26	Tue 6/9/26	54FS+20 days
56	BUOW #4 and Report	30 days	Wed 7/8/26	Tue 8/18/26	55FS+20 days
57	BUOW Relocation	15 days	Fri 8/27/27	Thu 9/16/27	56
58	SWHA #1 and TCBB #1	5 days	Mon 3/2/26	Fri 3/6/26	
59	SWHA #2 and TCBB #2	5 days	Mon 3/30/26	Fri 4/3/26	58FS+15 days
60	SWHA #3 and TCBB #3	5 days	Mon 4/27/26	Fri 5/1/26	59FS+15 days
61	SWHA #4	5 days	Mon 6/1/26	Fri 6/5/26	60FS+20 days
62	SWHA #5	5 days	Mon 6/29/26	Fri 7/3/26	61FS+15 days
63	SWHA #6 and Report	30 days	Wed 7/15/26	Tue 8/25/26	62FS+7 days
64	TCBB Report	30 days	Mon 5/4/26	Fri 6/12/26	60
65	Vernal Pool Wet Season Survey 1	10 days	Mon 12/1/25	Fri 12/12/25	11
66	Vernal Pool Wet Season Survey 2	10 days	Mon 1/5/26	Fri 1/16/26	65FS+15 days
67	Vernal Pool Wet Season Survey 3	10 days	Mon 2/9/26	Fri 2/20/26	66FS+15 days
68	Vernal Pool Wet Season Survey 4 (more may be needed) and R	60 days	Mon 3/16/26	Fri 6/5/26	67FS+15 days
69	VELB Survey and Report	30 days	Tue 4/1/25	Mon 5/12/25	
70	VELB Transplant	20 days	Tue 12/9/25	Mon 1/5/26	69FS+150 days



Project: Maxwell Sites Pumping
Date: Mon 1/30/23

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

Draft_0021962

Sites Reservoir
Preliminary Construction Schedule
Maxwell - Sites Pumping and Generating (MSPG) Facilities
January 2023

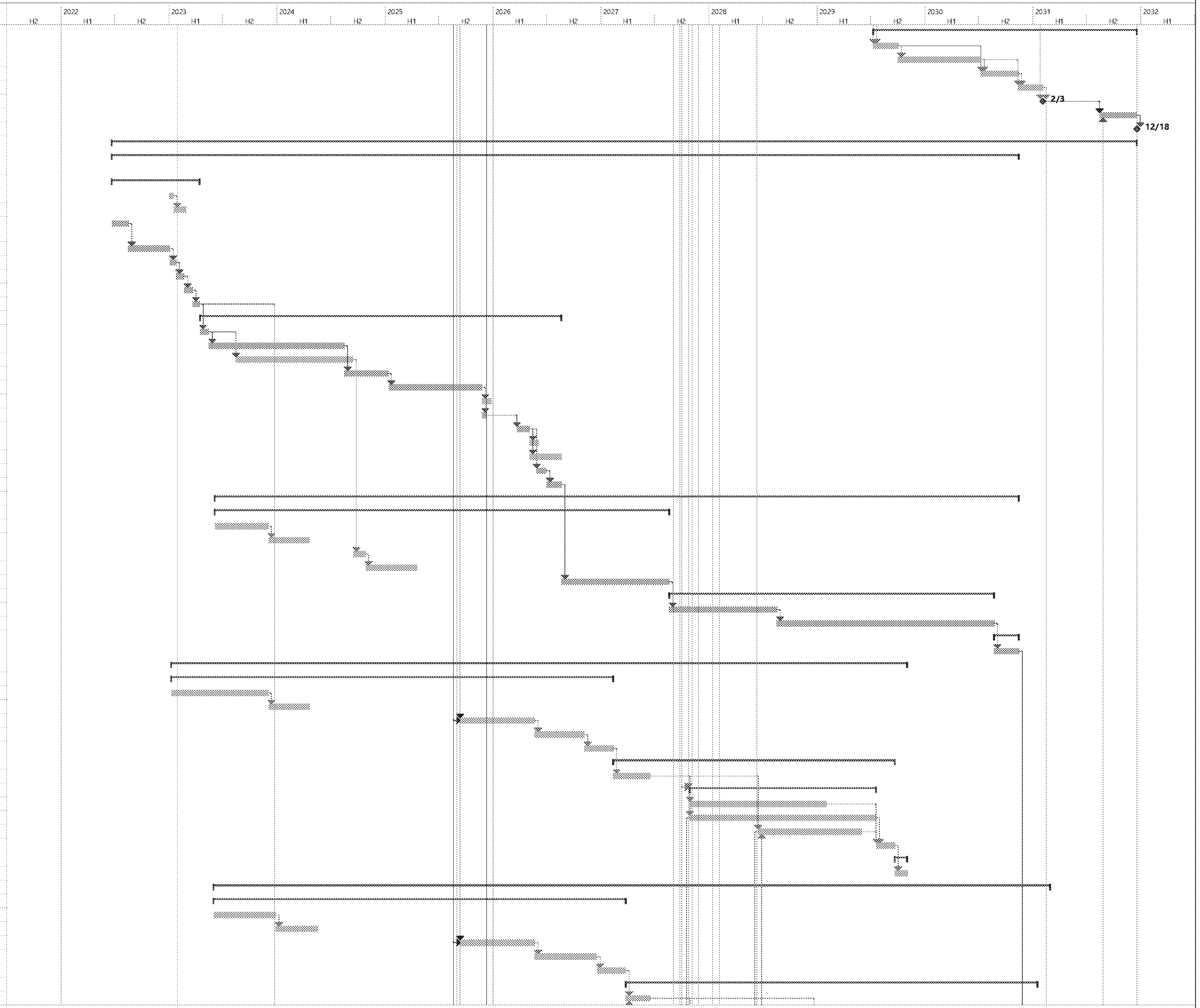
ID	Task Name	Duration	Start	Finish	Predecessors
71	Bank Swallow Survey and Report	30 days	Thu 5/1/25	Wed 6/11/25	
72	CRLF Surveys and Report	200 days	Mon 1/5/26	Fri 10/9/26	
73	Bumble Bee Survey 1	5 days	Wed 4/1/26	Tue 4/7/26	69SS
74	Bumble Bee Survey 2	5 days	Wed 4/29/26	Tue 5/5/26	73FS+15 days
75	Bumble Bee Survey 3	5 days	Wed 5/27/26	Tue 6/2/26	74FS+15 days
76	Bumble Bee Survey 4 and Report	45 days	Wed 6/24/26	Tue 8/25/26	75FS+15 days
77	Badger Survey and Report	30 days	Thu 6/12/25	Wed 7/23/25	71
78	Bat Survey (Roosts)	10 days	Thu 7/24/25	Wed 8/6/25	77
79	Bat Roosts Removal	10 days	Thu 8/7/25	Wed 8/20/25	78
80	USFWS - Amend ESA Consultation: Prepare Report and Submit	90 days	Mon 10/12/26	Fri 2/12/27	68,69,72
81	USFWS Review and Amend ESA Permit and Take Statement	120 days	Mon 2/15/27	Fri 7/30/27	80
82	CDFW - Amend ESA ITP: Prepare Report and Submit	90 days	Wed 8/26/26	Tue 12/29/26	71,76
83	CDFW Review Report and Ament ITP Take Statement	120 days	Wed 12/30/26	Tue 6/15/27	82
84	Precon Avoidance (GGS, Avian, mammal, other CEQA spp)	30 days	Wed 7/7/27	Tue 8/17/27	83FS+15 days
85	**Compensatory Mitigation**	**305 days**	**Fri 3/12/27**	**Thu 5/11/28**	
86	Secure LOC/Implement Mitigation Prior to Take	305 days	Fri 3/12/27	Thu 5/11/28	82SS
87	**Cultural Work**	**820 days?**	**Fri 2/14/25**	**Thu 4/6/28**	
88	Prepare and Consult on Construction Phase Work Plan (per Section 106 PA)	120 days	Fri 2/14/25	Thu 7/31/25	
89	Cultural Survey - with Fee Title	180 days	Fri 8/1/25	Thu 4/9/26	88
90	Testing and Evaluation of Resources	180 days	Fri 4/10/26	Thu 12/17/26	89
91	Develop Treatment Plan and Implementation	260 days	Fri 4/10/26	Thu 4/8/27	89
92	Implement Avoidance/Minimization Activities During Const	260 days?	Fri 4/9/27	Thu 4/6/28	91
93	**CONSTRUCTION PACKAGE #1 - RESERVOIR FACILITIES (Rev 7 10-25-2**	**2165 days**	**Fri 9/1/23**	**Thu 12/18/31**	
94	**Engineering - Dams**	**995 days**	**Fri 9/1/23**	**Thu 6/24/27**	
95	**Inlet-Outlet Design**	**995 days**	**Fri 9/1/23**	**Thu 6/24/27**	
96	**Inlet-Outlet Design (CP#2 - MSPG)**	**995 days**	**Fri 9/1/23**	**Thu 6/24/27**	
97	Inlet-Outlet 30% Design	151 days	Fri 9/1/23	Fri 3/29/24	40
98	Inlet-Outlet Package Submittal	0 days	Fri 3/29/24	Fri 3/29/24	97,40
99	DSOD Review of Inlet-Outlet 30% Design	26 wks	Mon 4/1/24	Fri 9/27/24	98
100	Inlet-Outlet Geotech Data	0 days	Thu 2/13/25	Thu 2/13/25	41
101	Inlet-Outlet 60% Design	39 wks	Fri 2/14/25	Thu 11/13/25	100
102	DSOD Review of Inlet-Outlet 60% Design	26 wks	Fri 11/14/25	Thu 5/14/26	99,101
103	Inlet-Outlet 90% Design	13 wks	Fri 5/15/26	Thu 8/13/26	102
104	DSOD Review of Inlet-Outlet 90% Design	26 wks	Fri 8/14/26	Thu 2/11/27	103
105	Inlet-Outlet 100% Design	7 wks	Fri 2/12/27	Thu 4/1/27	104
106	DSOD Review of Inlet-Outlet 100% Design Package	12 wks	Fri 4/2/27	Thu 6/24/27	105
107	Inlet-Outlet DSOD Approval Received	0 days	Thu 6/24/27	Thu 6/24/27	106
108	**CMAR Procurement (CP#2 - MSPG)**	**195 days**	**Mon 11/3/25**	**Mon 8/3/26**	
109	Award CMAR Contract	0 days	Mon 11/3/25	Mon 11/3/25	238SS+37 days
110	Notice to Proceed	6 wks	Tue 11/4/25	Mon 12/15/25	109
111	Early Submittals And Approvals - I/O and PGPs	90 days	Tue 12/16/25	Mon 4/20/26	110
112	CMAR Mobilization	6 mons	Tue 2/17/26	Mon 8/3/26	110,111SS+45 days
113	**Roads, Bridges, Access, and Site Development**	**692 days**	**Thu 2/13/25**	**Mon 10/11/27**	
114	Early Site Access and Staging Development	100 days	Tue 2/17/26	Mon 7/6/26	112SS
115	**Southern Construction Access Roads (Maxwell-Sites, Shoo-fly, /**	**667 days**	**Thu 2/13/25**	**Mon 9/6/27**	
116	Geotechnical Data	0 days	Thu 2/13/25	Thu 2/13/25	42
117	Final Design	39 wks	Fri 2/14/25	Thu 11/13/25	116
118	Procurement and NTP	90 days	Tue 8/4/26	Mon 12/7/26	112,117
119	Southern Construction Access Roads (Maxwell-Sites, Shoo-fly,	195 days	Tue 12/8/26	Mon 9/6/27	118
120	**Ancillary Roads B1, B2, C1, C2, Comm N., Comm South**	**692 days**	**Thu 2/13/25**	**Mon 10/11/27**	
121	Geotechnical Data	0 days	Thu 2/13/25	Thu 2/13/25	42
122	Final Design	39 wks	Fri 2/14/25	Thu 11/13/25	121
123	Procurement and NTP	90 days	Tue 8/4/26	Mon 12/7/26	112,122
124	Ancillary Roads B1, B2, C1, C2, Comm N., Comm South	220 days	Tue 12/8/26	Mon 10/11/27	123
125	**Inlet-Outlet Preliminary Work (CP#2 - MSPG)**	**100 days**	**Tue 9/7/27**	**Mon 1/24/28**	
126	Inlet-Outlet Access and Staging	100 days	Tue 9/7/27	Mon 1/24/28	107,112,115
127	Erosion and Sediment Control	100 days	Tue 9/7/27	Mon 1/24/28	126SS
128	Clearing / Grubbing Topsoil Salvage from Work Areas	100 days	Tue 9/7/27	Mon 1/24/28	126SS
129	Demolition	50 days	Tue 9/21/27	Mon 11/29/27	126SS+10 days
130	**Inlet Outlet Facilities (CP#2 - MSPG)**	**1018 days**	**Tue 1/25/28**	**Thu 12/18/31**	
131	**Develop Downstream Portal**	**80 days**	**Tue 1/25/28**	**Mon 5/15/28**	
132	Downstream Portal Excavation	80 days	Tue 1/25/28	Mon 5/15/28	107,112,126,127,128,129
133	Downstream Portal Rock Bolting	80 days	Tue 1/25/28	Mon 5/15/28	132SS
134	**Develop Upstream Portal**	**185 days**	**Tue 1/25/28**	**Mon 10/9/28**	
135	Intake Channel Excavation	60 days	Tue 1/25/28	Mon 4/17/28	107,112,126
136	Upstream Portal Excavation	125 days	Tue 4/18/28	Mon 10/9/28	135
137	Upstream Portal Rock Bolting	125 days	Tue 4/18/28	Mon 10/9/28	136SS
138	**Tunnels Excavation and Lining (Double Shift)**	**480 days**	**Tue 5/16/28**	**Mon 3/18/30**	
139	Tunnel Excavation - Double Shift	300 days	Tue 5/16/28	Mon 7/9/29	133
140	Tunnel Lining	180 days	Tue 7/10/29	Mon 3/18/30	139

Project: Maxwell Sites Pumping
Date: Mon 1/30/23

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

Draft_0021963

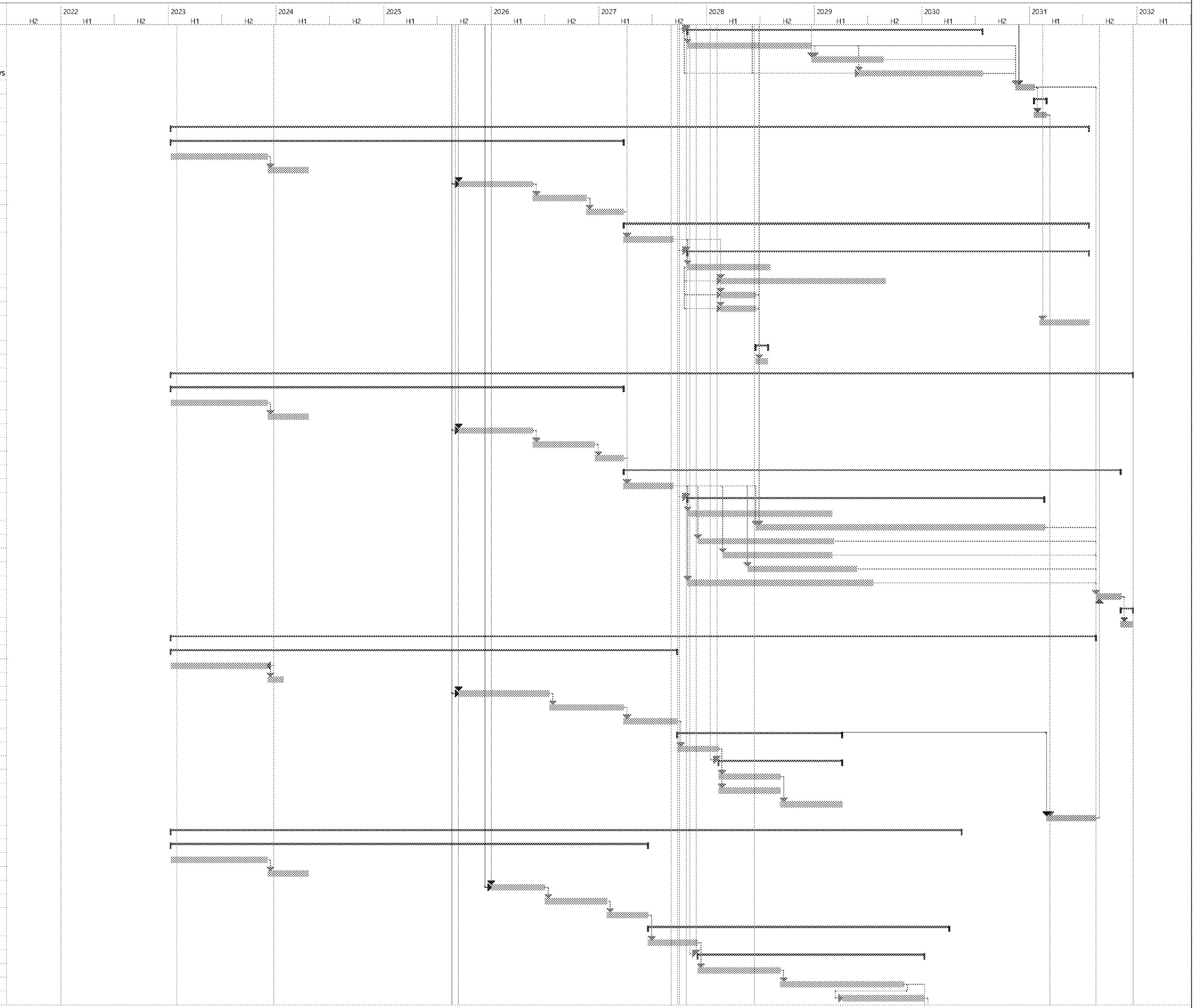
ID	Task Name	Duration	Start	Finish	Predecessors
141	**Intake and Outlet Structures**	**638 days**	**Tue 7/10/29**	**Thu 12/18/31**	
142	Intake Structure Foundation	60 days	Tue 7/10/29	Mon 10/1/29	137,139
143	Intake Structure Concrete	200 days	Tue 10/2/29	Mon 7/8/30	142
144	Intake Structure Gates and Mechanical	90 days	Tue 7/9/30	Mon 11/11/3C	142,143
145	I/O Completion and Restoration	60 days	Tue 11/12/30	Mon 2/3/31	143,144
146	Inlet-Outlet Ready for Commissioning	0 days	Mon 2/3/31	Mon 2/3/31	140,145
147	Inlet-Outlet Startup and Commissioning	90 days	Fri 8/15/31	Thu 12/18/31	146,266
148	Inlet-Outlet Completion	0 days	Thu 12/18/31	Thu 12/18/31	147
149	**CONSTRUCTION PACKAGE #2 - MSPG FACILITIES**	**2477 days**	**Wed 6/22/22**	**Thu 12/18/31**	
150	**POWER INTERCONNECTION (CAISO / PG&E DESIGN AND CONSTRUCTION)**	**2192 days**	**Wed 6/22/22**	**Thu 11/14/30**	
151	**Prepare & Submit CAISO Package**	**213 days**	**Wed 6/22/22**	**Fri 4/14/23**	
152	Prepare Pump/Motor Package for Vendors to obtain Data	10 days	Tue 1/3/23	Mon 1/16/23	
153	Pump Vendors Prepare & Send Data	30 days	Tue 1/17/23	Mon 2/27/23	152
154	Prepare Hydropower Generator/Turbine Package for Vendors to Obtain Data	40 days	Wed 6/22/22	Tue 8/16/22	
155	Generator/Turbine Vendors Prepare & Send Data	100 days	Wed 8/17/22	Tue 1/3/23	154
156	HC Engineering Team provide info to ZGlobal	15 days	Wed 1/4/23	Tue 1/24/23	155
157	ZGlobal run models and prepare CAISO package	20 days	Wed 1/25/23	Tue 2/21/23	156
158	Sites Review CAISO Package & Approve	20 days	Wed 2/22/23	Tue 3/21/23	157
159	Zglobal Submit CAISO Package & Sites Submit $500k in Fees	18 days	Wed 3/22/23	Fri 4/14/23	158
160	**Respond to CAISO**	**874 days**	**Mon 4/17/23**	**Thu 8/20/26**	
161	Scoping Meeting	21 days	Mon 4/17/23	Mon 5/15/23	159
162	Phase 1 Study	328 days	Tue 5/16/23	Thu 8/15/24	161
163	Phase 1 Results Meeting	283 days	Wed 8/16/23	Fri 9/13/24	161FS+66 days
164	First Finanical Security Posting	106 days	Fri 8/16/24	Fri 1/10/25	162
165	Phase II Study	226 days	Mon 1/13/25	Mon 11/24/25	164
166	Phase II Results Meeting	22 days	Tue 11/25/25	Wed 12/24/25	165
167	Transmission Plan Deliverability (Resource Adequacy Process)	10 days	Tue 11/25/25	Mon 12/8/25	165
168	Second Financial Security Posting	31 days	Mon 3/23/26	Mon 5/4/26	167FS+74 days
169	Draft Impact Analysis Issues	23 days	Tue 5/5/26	Thu 6/4/26	168
170	Reassessment Results	78 days	Tue 5/5/26	Thu 8/20/26	168
171	Receive Draft Interconnection Agreement from CAISO	23 days	Fri 5/29/26	Tue 6/30/26	168FS+18 days
172	Negotiate Interconnection Agreement	37 days	Wed 7/1/26	Thu 8/20/26	171
173	**PG&E Point of Interconnection Substation**	**1944 days**	**Mon 6/5/23**	**Thu 11/14/30**	
174	**Engineering**	**1099 days**	**Mon 6/5/23**	**Thu 8/19/27**	
175	Preliminary Design 30% (by HC)	130 days	Mon 6/5/23	Fri 12/1/23	
176	Class 3 Cost Estimate (by HC)	100 days	Mon 12/4/23	Fri 4/19/24	175
177	Establish E&P Agreement with PG&E	30 days	Mon 9/16/24	Fri 10/25/24	163
178	Preliminary Design 30% - by PG&E	125 days	Mon 10/28/24	Fri 4/18/25	177
179	Final 60%, 90%, 100% Design - by PG&E	260 days	Fri 8/21/26	Thu 8/19/27	172
180	**Construction - by PG&E**	**785 days**	**Fri 8/20/27**	**Thu 8/22/30**	
181	Procure Equipment	260 days	Fri 8/20/27	Thu 8/17/28	179
182	Construction	525 days	Fri 8/18/28	Thu 8/22/30	181
183	**Commissioning**	**60 days**	**Fri 8/23/30**	**Thu 11/14/30**	
184	Commission	60 days	Fri 8/23/30	Thu 11/14/30	182
185	**Funks/TRR Pipelines (DSOD Jurisdictional)**	**1779 days**	**Mon 1/9/23**	**Thu 11/1/29**	
186	**Engineering**	**1069 days**	**Mon 1/9/23**	**Thu 2/11/27**	
187	Preliminary (30%)	235 days	Mon 1/9/23	Fri 12/1/23	
188	Class 3 Cost Estimate	100 days	Mon 12/4/23	Fri 4/19/24	187
189	Final 60% Design	180 days	Fri 9/12/25	Thu 5/21/26	11,38FS-140 days
190	Final 90% Design	120 days	Fri 5/22/26	Thu 11/5/26	189
191	Final 100% Design	70 days	Fri 11/6/26	Thu 2/11/27	190
192	**Construction**	**680 days**	**Fri 2/12/27**	**Thu 9/20/29**	
193	Submittals	90 days	Fri 2/12/27	Thu 6/17/27	191
194	**Field Construction**	**450 days**	**Fri 10/29/27**	**Thu 7/19/29**	**81,83,86FS-140 days,91**
195	Structures	330 days	Fri 10/29/27	Thu 2/1/29	193
196	Pipelines	450 days	Fri 10/29/27	Thu 7/19/29	193
197	Pipelines in Reservoir	250 days	Fri 6/16/28	Thu 5/31/29	193,230
198	Testing	45 days	Fri 7/20/29	Thu 9/20/29	195,196,197
199	**Commissioning**	**30 days**	**Fri 9/21/29**	**Thu 11/1/29**	
200	Commission	30 days	Fri 9/21/29	Thu 11/1/29	198
201	**Transmission Powerlines**	**2021 days**	**Thu 6/1/23**	**Thu 2/27/31**	
202	**Engineering**	**996 days**	**Thu 6/1/23**	**Thu 3/25/27**	
203	Preliminary (30%)	150 days	Thu 6/1/23	Wed 12/27/23	
204	Class 3 Cost Estimate	100 days	Thu 12/28/23	Wed 5/15/24	203
205	Final 60% Design	180 days	Fri 9/12/25	Thu 5/21/26	11,38FS-140 days
206	Final 90% Design	150 days	Fri 5/22/26	Thu 12/17/26	205
207	Final 100% Design	70 days	Fri 12/18/26	Thu 3/25/27	206
208	**Construction**	**995 days**	**Fri 3/26/27**	**Thu 1/16/31**	
209	Submittals	60 days	Fri 3/26/27	Thu 6/17/27	207,240



Project: Maxwell Sites Pumping
Date: Mon 1/30/23

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

ID	Task Name	Duration	Start	Finish	Predecessors
210	**Field Construction**	**715 days**	**Fri 10/29/27**	**Thu 7/25/30**	**81,83,86FS-140 days,91**
211	Procurement	300 days	Fri 10/29/27	Thu 12/21/28	209
212	Towers/Powerlines to POI	175 days	Fri 12/22/28	Thu 8/23/29	209,211
213	Towers/Powerlines Funks/TRR	300 days	Fri 6/1/29	Thu 7/25/30	196SS+250 days,211,197SS+250 days
214	Testing	45 days	Fri 11/15/30	Thu 1/16/31	211,212,213,184
215	**Commissioning**	**30 days**	**Fri 1/17/31**	**Thu 2/27/31**	
216	Commission	30 days	Fri 1/17/31	Thu 2/27/31	214
217	**Funks Reservoir**	**2226 days**	**Mon 1/9/23**	**Mon 7/21/31**	
218	**Engineering**	**1099 days**	**Mon 1/9/23**	**Thu 3/25/27**	
219	Preliminary Design (30%)	235 days	Mon 1/9/23	Fri 12/1/23	
220	Class 3 Cost Estimate	100 days	Mon 12/4/23	Fri 4/19/24	219
221	Final 60% Design	180 days	Fri 9/12/25	Thu 5/21/26	11,38FS-140 days
222	Final 90% Design	130 days	Fri 5/22/26	Thu 11/19/26	221
223	Final 100% Design	90 days	Fri 11/20/26	Thu 3/25/27	222
224	**Construction**	**1127 days**	**Fri 3/26/27**	**Mon 7/21/31**	
225	Submittals	120 days	Fri 3/26/27	Thu 9/9/27	223
226	**Field Construction**	**972 days**	**Fri 10/29/27**	**Mon 7/21/31**	**81,83,86FS-140 days,91**
227	Haulroads	200 days	Fri 10/29/27	Thu 8/3/28	225
228	Initial Sediment Removal	400 days	Fri 2/18/28	Thu 8/30/29	225,227SS+80 days
229	PGP Cofferdams (build)	85 days	Fri 2/18/28	Thu 6/15/28	225,227SS+80 days
230	Pipeline Cofferdams (build)	85 days	Fri 2/18/28	Thu 6/15/28	225,227SS+80 days
231	Final Sediment Removal (After I/O and Golden Gate Dam nearly complete)	120 days	Tue 2/4/31	Mon 7/21/31	145
232	**Commissioning**	**30 days**	**Fri 6/16/28**	**Thu 7/27/28**	
233	Commission	30 days	Fri 6/16/28	Thu 7/27/28	230
234	**Funks Pumping Generating Plant**	**2334 days**	**Mon 1/9/23**	**Thu 12/18/31**	
235	**Engineering**	**1099 days**	**Mon 1/9/23**	**Thu 3/25/27**	
236	Preliminary (30%)	235 days	Mon 1/9/23	Fri 12/1/23	
237	Class 3 Cost Estimate	100 days	Mon 12/4/23	Fri 4/19/24	236
238	Final 60% Design	180 days	Fri 9/12/25	Thu 5/21/26	11,38FS-140 days
239	Final 90% Design	150 days	Fri 5/22/26	Thu 12/17/26	238
240	Final 100% Design	70 days	Fri 12/18/26	Thu 3/25/27	239
241	**Construction**	**1205 days**	**Fri 3/26/27**	**Thu 11/6/31**	
242	Submittals	120 days	Fri 3/26/27	Thu 9/9/27	240
243	**Field Construction**	**865 days**	**Fri 10/29/27**	**Thu 2/20/31**	**81,83,86FS-140 days,91**
244	Large Equipment Procurement	350 days	Fri 10/29/27	Thu 3/1/29	242
245	Pump Generating Plant Structure	700 days	Fri 6/16/28	Thu 2/20/31	242,229
246	Turbine Structure	330 days	Fri 12/3/27	Thu 3/8/29	242FS+60 days
247	Energy Dissipation Valve Structure	265 days	Fri 2/25/28	Thu 3/1/29	242FS+120 days
248	Electrical Building	265 days	Fri 5/19/28	Thu 5/24/29	242FS+180 days
249	Site Electrical and PGP Sitework	450 days	Fri 10/29/27	Thu 7/19/29	242
250	Testing	60 days	Fri 8/15/31	Thu 11/6/31	249,245,246,248,247,214,266
251	**Commissioning**	**30 days**	**Fri 11/7/31**	**Thu 12/18/31**	
252	Commission	30 days	Fri 11/7/31	Thu 12/18/31	250
253	**Funks Substation**	**2244 days**	**Mon 1/9/23**	**Thu 8/14/31**	
254	**Engineering (Excludes PG&E]**	**1229 days**	**Mon 1/9/23**	**Thu 9/23/27**	
255	Design 30%	235 days	Mon 1/9/23	Fri 12/1/23	159FF+30 days
256	Class 3 Cost Estimate	40 days	Mon 12/4/23	Fri 1/26/24	255
257	Final 60% Design	220 days	Fri 9/12/25	Thu 7/16/26	11,38FS-140 days
258	Final 90% Design	180 days	Fri 7/17/26	Thu 3/25/27	257
259	Final 100% Design	130 days	Fri 3/26/27	Thu 9/23/27	258
260	**Construction**	**400 days**	**Fri 9/24/27**	**Thu 4/5/29**	
261	Submittals	100 days	Fri 9/24/27	Thu 2/10/28	259
262	**Field Construction**	**300 days**	**Fri 2/11/28**	**Thu 4/5/29**	**81,83,86FS-140 days,91**
263	Earthwork/Pad Prep	150 days	Fri 2/11/28	Thu 9/7/28	261
264	Large Equipment Procurement	150 days	Fri 2/11/28	Thu 9/7/28	261
265	Breaker Substation	150 days	Fri 9/8/28	Thu 4/5/29	263
266	Commissioning	120 days	Fri 2/28/31	Thu 8/14/31	260,216
267	**TRR West Reservoir**	**1918 days**	**Mon 1/9/23**	**Wed 5/15/30**	
268	**Engineering**	**1158 days**	**Mon 1/9/23**	**Wed 6/16/27**	
269	Preliminary (30%)	235 days	Mon 1/9/23	Fri 12/1/23	
270	Class 3 Cost Estimate	100 days	Mon 12/4/23	Fri 4/19/24	269
271	Final 60% Design	130 days	Thu 1/1/26	Wed 7/1/26	11,38FS-140 days
272	Final 90% Design	150 days	Thu 7/2/26	Wed 1/27/27	271
273	Final 100% Design	100 days	Thu 1/28/27	Wed 6/16/27	272
274	**Construction**	**730 days**	**Thu 6/17/27**	**Wed 4/3/30**	
275	Submittals	120 days	Thu 6/17/27	Wed 12/1/27	273
276	**Field Construction**	**550 days**	**Thu 12/2/27**	**Wed 1/9/30**	**81,83,86FS-140 days,91**
277	Haulroads	200 days	Thu 12/2/27	Wed 9/6/28	275
278	Earthwork/Structures	300 days	Thu 9/7/28	Wed 10/31/29	277
279	Subgrade and Liner	200 days	Thu 4/5/29	Wed 1/9/30	278FS-1200 hrs



Project: Maxwell Sites Pumping
Date: Mon 1/30/23

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

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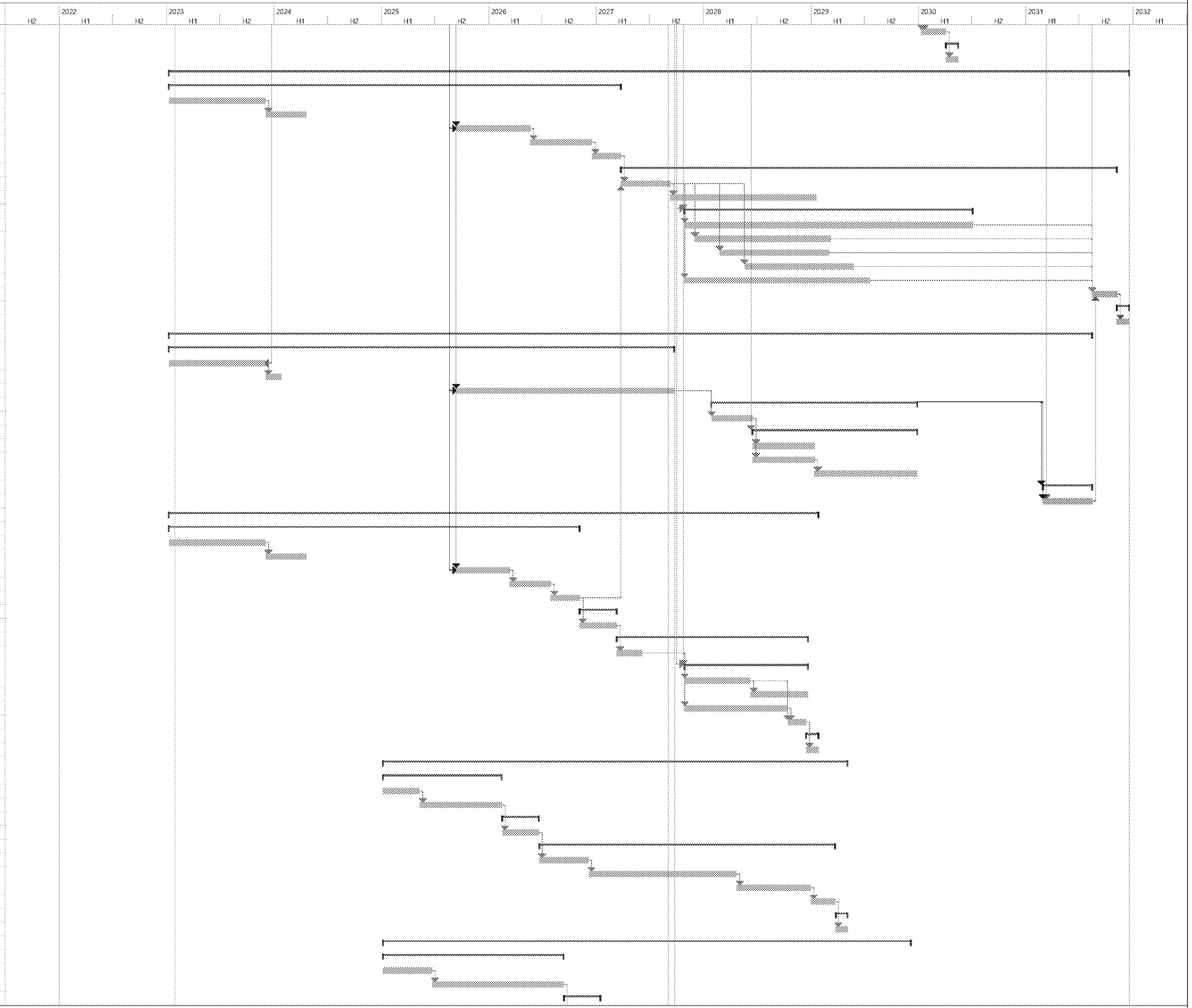
Sites Reservoir
Preliminary Construction Schedule
Maxwell - Sites Pumping and Generating (MSPG) Facilities
January 2023

ID	Task Name	Duration	Start	Finish	Predecessors
280	Testing	60 days	Thu 1/10/30	Wed 4/3/30	278,279
281	**Commissioning**	**30 days**	**Thu 4/4/30**	**Wed 5/15/30**	
282	Commission	30 days	Thu 4/4/30	Wed 5/15/30	280
283	**TRR West Pumping Generating Plant**	**2334 days**	**Mon 1/9/23**	**Thu 12/18/31**	
284	**Engineering**	**1099 days**	**Mon 1/9/23**	**Thu 3/25/27**	
285	Preliminary (30%)	235 days	Mon 1/9/23	Fri 12/1/23	
286	Class 3 Cost Estimate	100 days	Mon 12/4/23	Fri 4/19/24	285
287	Final 60% Design	180 days	Fri 9/12/25	Thu 5/21/26	11,38FS-140 days
288	Final 90% Design	150 days	Fri 5/22/26	Thu 12/17/26	287
289	Final 100% Design	70 days	Fri 12/18/26	Thu 3/25/27	288
290	**Construction**	**1205 days**	**Fri 3/26/27**	**Thu 11/6/31**	
291	Submittals	120 days	Fri 3/26/27	Thu 9/9/27	289,321
292	Large Equipment Procurement	355 days	Fri 9/10/27	Thu 1/18/29	291
293	**Field Construction**	**700 days**	**Fri 10/29/27**	**Thu 7/4/30**	**81,83,86FS-140 days,91**
294	Pump Generating Plant Structure	700 days	Fri 10/29/27	Thu 7/4/30	291
295	Turbine Structure	330 days	Fri 12/3/27	Thu 3/8/29	291FS+60 days
296	Energy Dissipation Valve Structure	265 days	Fri 2/25/28	Thu 3/1/29	291FS+120 days
297	Electrical Building	265 days	Fri 5/19/28	Thu 5/24/29	291FS+180 days
298	Site Electrical and PGP Sitework	450 days	Fri 10/29/27	Thu 7/19/29	291
299	Testing	60 days	Fri 8/15/31	Thu 11/6/31	214,297,294,295,296,298,314
300	**Commissioning**	**30 days**	**Fri 11/7/31**	**Thu 12/18/31**	
301	Commission	30 days	Fri 11/7/31	Thu 12/18/31	299
302	**TRR West Substation**	**2244 days**	**Mon 1/9/23**	**Thu 8/14/31**	
303	**Engineering [excludes PG&E]**	**1229 days**	**Mon 1/9/23**	**Thu 9/23/27**	
304	Preliminary (30%)	235 days	Mon 1/9/23	Fri 12/1/23	159FF+30 days
305	Class 3 Cost Estimate	40 days	Mon 12/4/23	Fri 1/26/24	304
306	Design (60%, 90%, 100%)	530 days	Fri 9/12/25	Thu 9/23/27	11,38FS-140 days
307	**Construction**	**500 days**	**Fri 1/28/28**	**Thu 12/27/29**	
308	Submittals	100 days	Fri 1/28/28	Thu 6/15/28	306FS+90 days
309	**Field Construction**	**400 days**	**Fri 6/16/28**	**Thu 12/27/29**	**81,83,86FS-140 days,91**
310	Earthwork/Pad Prep	150 days	Fri 6/16/28	Thu 1/11/29	308
311	Large Equipment Procurement	150 days	Fri 6/16/28	Thu 1/11/29	308
312	Structures	250 days	Fri 1/12/29	Thu 12/27/29	311
313	**Commissioning**	**120 days**	**Fri 2/28/31**	**Thu 8/14/31**	**307**
314	Commission	120 days	Fri 2/28/31	Thu 8/14/31	307,216
315	**CONSTRUCTION PACKAGE #5 - DUNNIGAN PIPELINE (ALT 1)**	**1579 days**	**Mon 1/9/23**	**Thu 1/25/29**	
316	**Engineering**	**999 days**	**Mon 1/9/23**	**Thu 11/5/26**	
317	Preliminary (30%)	235 days	Mon 1/9/23	Fri 12/1/23	
318	Class 3 Cost Estimate	100 days	Mon 12/4/23	Fri 4/19/24	317
319	Final 60% Design	130 days	Fri 9/12/25	Thu 3/12/26	11,38FS-140 days
320	Final 90% Design	100 days	Fri 3/13/26	Thu 7/30/26	319
321	Final 100% Design	70 days	Fri 7/31/26	Thu 11/5/26	320
322	**Bid and Award**	**90 days**	**Fri 11/6/26**	**Thu 3/11/27**	
323	Bid and Award	90 days	Fri 11/6/26	Thu 3/11/27	321
324	**Construction**	**465 days**	**Fri 3/12/27**	**Thu 12/21/28**	
325	Submittals	60 days	Fri 3/12/27	Thu 6/3/27	323
326	**Field Construction**	**300 days**	**Fri 10/29/27**	**Thu 12/21/28**	**81,83,86FS-140 days,91**
327	TCC Intake Structure	160 days	Fri 10/29/27	Thu 6/8/28	325
328	CBD Discharge Structure	140 days	Fri 6/9/28	Thu 12/21/28	327
329	Pipeline	250 days	Fri 10/29/27	Thu 10/12/28	325
330	Testing	45 days	Fri 10/13/28	Thu 12/14/28	327,329
331	**Commissioning**	**30 days**	**Fri 12/15/28**	**Thu 1/25/29**	
332	Commission	30 days	Fri 12/15/28	Thu 1/25/29	330
333	**CONSTRUCTION PACKAGE #6 - RED BLUFF PUMPING PLANT (BY TCC**	**1130 days**	**Mon 1/6/25**	**Fri 5/4/29**	
334	**Engineering**	**290 days**	**Mon 1/6/25**	**Fri 2/13/26**	
335	Preliminary (30%)	90 days	Mon 1/6/25	Fri 5/9/25	
336	Final (60%, 90%, 100%)	200 days	Mon 5/12/25	Fri 2/13/26	335
337	**Bid and Award**	**90 days**	**Mon 2/16/26**	**Fri 6/19/26**	
338	Bid and Award	90 days	Mon 2/16/26	Fri 6/19/26	336
339	**Construction**	**720 days**	**Mon 6/22/26**	**Fri 3/23/29**	
340	Submittals	120 days	Mon 6/22/26	Fri 12/4/26	338
341	Pump Procurement	18 mons	Mon 12/7/26	Fri 4/21/28	340
342	Mechanical/Electrical	180 days	Mon 4/24/28	Fri 12/29/28	341
343	Testing	60 days	Mon 1/1/29	Fri 3/23/29	342
344	**Commissioning**	**30 days**	**Mon 3/26/29**	**Fri 5/4/29**	
345	Commission	30 days	Mon 3/26/29	Fri 5/4/29	343
346	**CONSTRUCTION PACKAGE #7 - GCID IMPROVMENTS (BY GCID)**	**1284 days**	**Mon 1/6/25**	**Thu 12/6/29**	
347	**Engineering**	**440 days**	**Mon 1/6/25**	**Fri 9/11/26**	
348	Preliminary (30%)	120 days	Mon 1/6/25	Fri 6/20/25	
349	Final (60%, 90%, 100%)	320 days	Mon 6/23/25	Fri 9/11/26	348
350	**Bid and Award**	**90 days**	**Mon 9/14/26**	**Fri 1/15/27**	



Project: Maxwell Sites Pumping
Date: Mon 1/30/23

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

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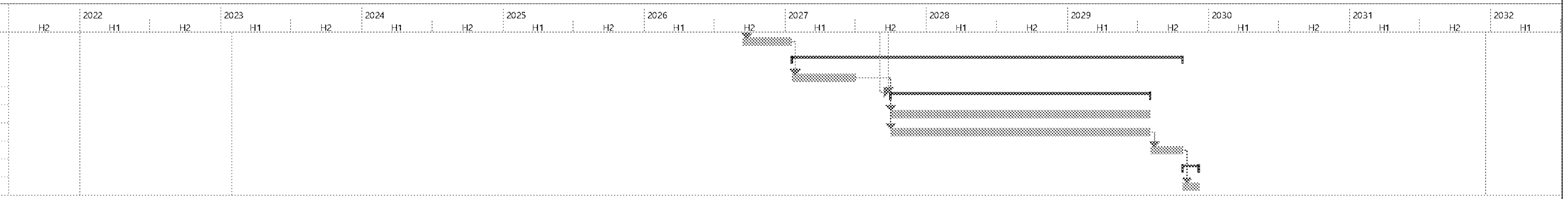
Sites Reservoir
Preliminary Construction Schedule
Maxwell - Sites Pumping and Generating (MSPG) Facilities
January 2023

ID	Task Name	Duration	Start	Finish	Predecessors
351	Bid and Award	90 days	Mon 9/14/26	Fri 1/15/27	349
352	**Construction**	**724 days**	**Mon 1/18/27**	**Thu 10/25/29**	
353	Submittals	120 days	Mon 1/18/27	Fri 7/2/27	351
354	**Field Construction**	**480 days**	**Fri 10/1/27**	**Thu 8/2/29**	**81,83,86FS-160 days,91**
355	Structures	24 mons	Fri 10/1/27	Thu 8/2/29	353
356	Earthwork	24 mons	Fri 10/1/27	Thu 8/2/29	353
357	Testing	60 days	Fri 8/3/29	Thu 10/25/29	356
358	**Commissioning**	**30 days**	**Fri 10/26/29**	**Thu 12/6/29**	
359	Commission	30 days	Fri 10/26/29	Thu 12/6/29	357



Project: Maxwell Sites Pumping
Date: Mon 1/30/23

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

File Provided Natively

Real Estate Team
Weekly Check-In – 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 Information:

Date:	January 30, 2023	**Location:**	Virtual – Microsoft Teams
Start Time:	2:00 p.m.	**Finish Time:**	3:00 p.m.
Purpose:	Real Estate Team – Weekly Check-In		

Meeting Participants:

Kevin Spesert	Jeff Mathews	Trishna Patel
Conner McDonald	Caitlin Nielsen	

Agenda:

Discussion Topic	Topic Leader
1. Overview and Opening Comments a. Preview - Next Week: The Sites Project Real Estate Approach	Kevin
2. Field Work – Previous Week's Recap a. January 24 -- Tuesday -- Funks Pre-Siting -- 7 Locations No Below-Water-Line Access; Utility Screening -- 5 Locations b. Core Sample Work at Corporate Yard c. GPS Locating at deep roadway borings in Colusa and Glenn d. FNK-B-025 - Drilled, Sampled, Cored, Downhole Geophysics e. FNK-B-016 - Resistivity Survey f. Near Miss - No Injury; No Damage	Conner / All
3. Field Work – Current and Upcoming a. Shift 17 - January 30 to February 3 - Funks TRR-B-021; FNK-B-016; TRR-B-022 b. Weather-Compromised Shoreline c. Fenceline to TRR-B-025 d. Below-Water-Line Work Cut-Off -- Per Don Babb e. Work Package 3 - Schedule Update	Conner / All
4. Landowner Engagement – Recap, Current Engagement, Look-Ahead a. Red Stick b. Wells Ranch Conner working with John, Jelica for specific Environmental Scope, Schedule, Locations, Expectations	Conner / Jeff / All

c. Banyan -- Conner working with John and Jelica for specific Environmental Scope, Schedule, Locations, Expectations; Eagle Permit still pending - anticipated between 4/1 and 5/1; Cattle on both parcels d. Owens e. Jensen f. Kellogg	
5. Local Coordination – Recap, Current Engagement, Look-Ahead a. USBR / TCCA – Funks Coordination With Don Babb b. GCID Coordination – Geotech Work Package 2	Conner / Jeff / All
6. Right-of-Way Manual a. Conner and Jeff will be working to finish Draft by March 3	Conner / Jeff / Trishna
7. Project Team – Interdisciplinary Coordination a. Engineering Team -- Geosyntec -- Two Staff to join Pre-Construction on January 24 b. Environmental Team – Tour – Water Board and USACE -- Ali, John, Jelica proposed to attend; January 27 c. Geotech Reporting – JP Request from Participants – Marcus to present Draft to Kevin, JP e. Construction Traffic -- Truck Circulation d. Mitigation Team – Meeting – January 23 g. Land Survey - Field Work - Georeferenced Locations -- Sutton Road, Wadleigh Road, Maxwell-Sites, Old Highway 99, I-5 -- pending Controls approval -- Field Work in late Winter / early Spring?	Conner / All
8. Administrative a. Real Estate Policy - Compensation Protocol - Dozer Lines and Operational Impacts b. Bemmerly Ranch -- Payment Approved	Conner
9. Open Discussion	All
10. Action-Item Recap	Caitlin
11. Next Steps	Kevin / Conner / All
12. Closing Thoughts	Kevin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Imagery Date: 4/18/2021
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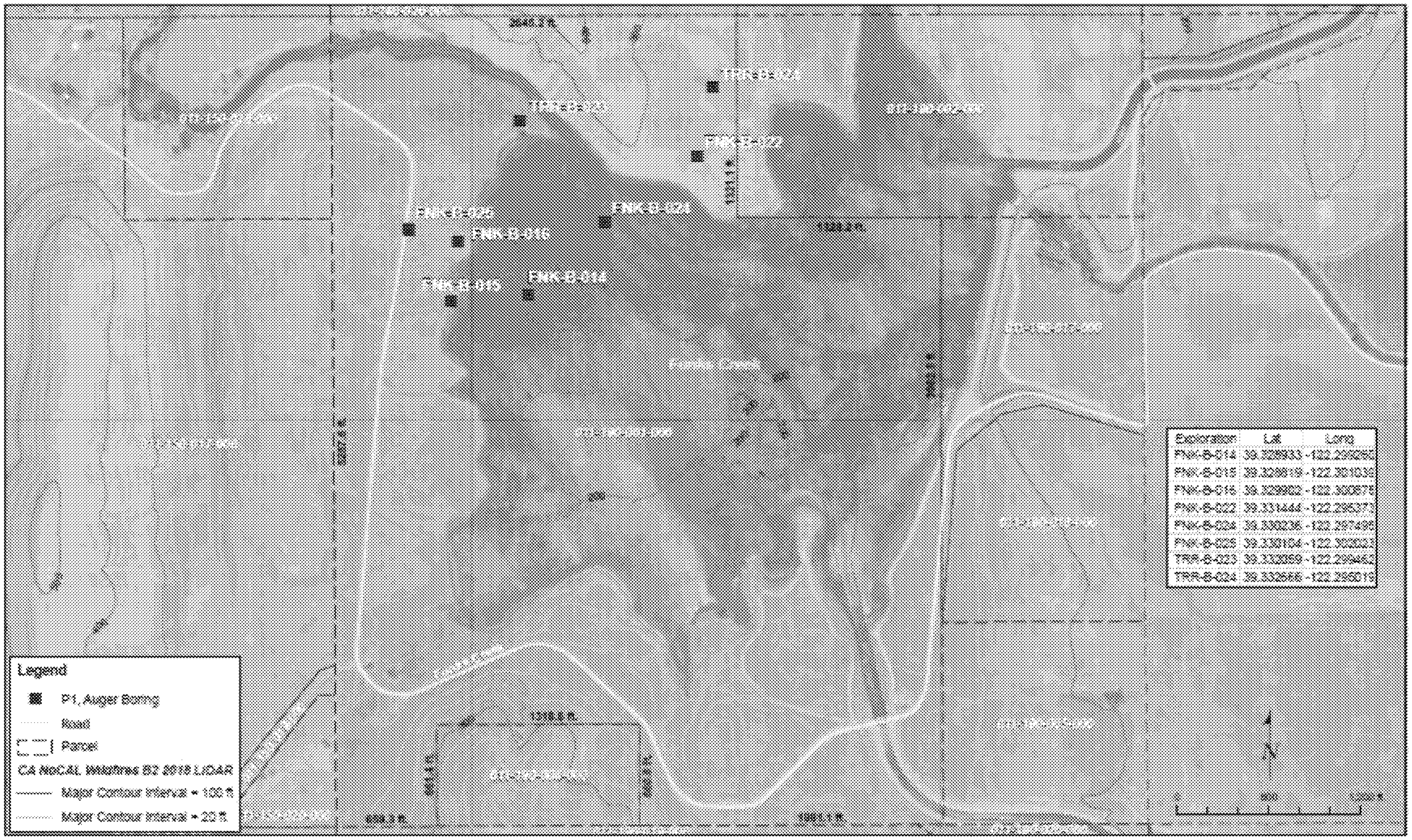
Google Earth



Exploration	Lat	Long
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FNK-B-015	39.328819	-122.301039
FNK-B-016	39.329902	-122.300875
FNK-B-022	39.331444	-122.295373
FNK-B-024	39.330236	-122.297496
FNK-B-025	39.330104	-122.300023
TRR-B-023	39.332059	-122.299462
TRR-B-024	39.332666	-122.295019

Plate 2: Tehama Colusa Canal Authority Properties - P1, Boring and CPT Locations (Parcel 011-190-001-000)

*Draft – Pre-decisional Working Document – For Discussion Purposes Only

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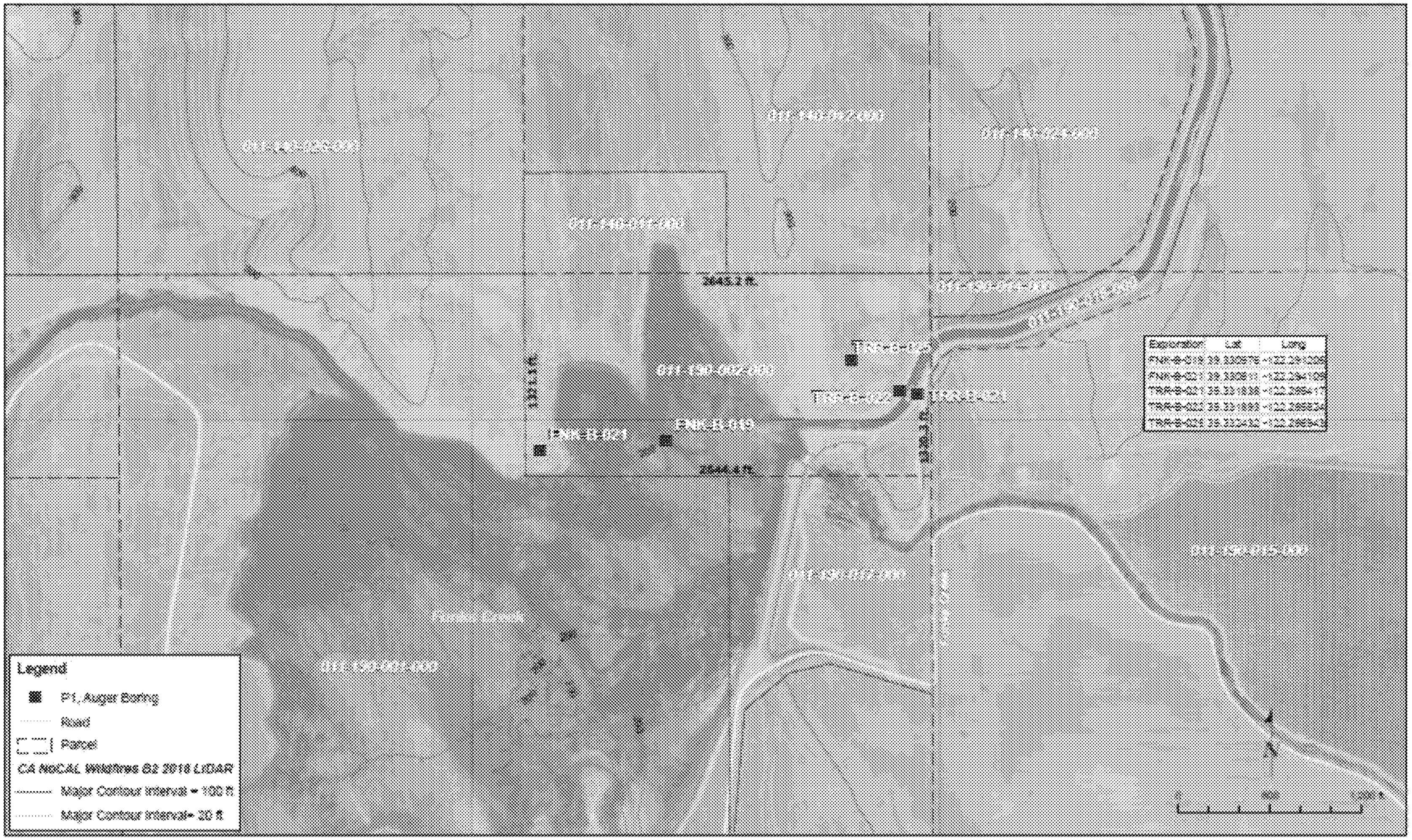

Plate 3: Tehama Colusa Canal Authority Properties - P1, Boring and CPT Locations (Parcel 011-190-002-000)

*Draft – Pre-decisional Working Document – For Discussion Purposes Only

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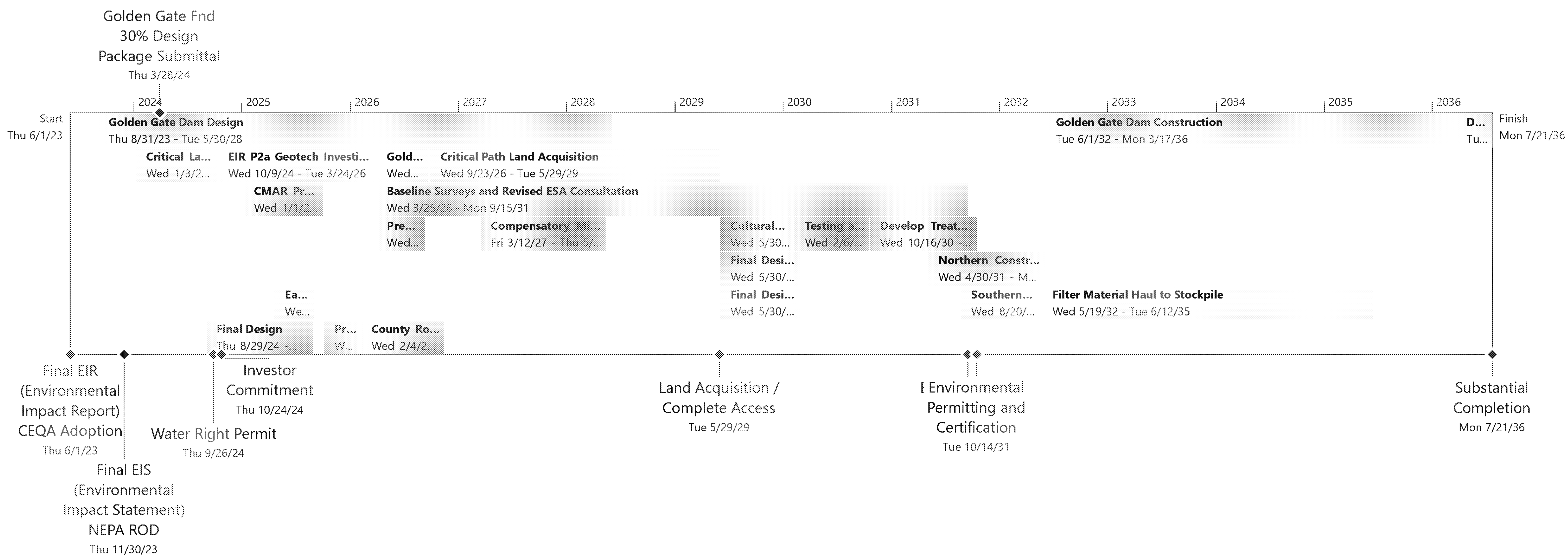
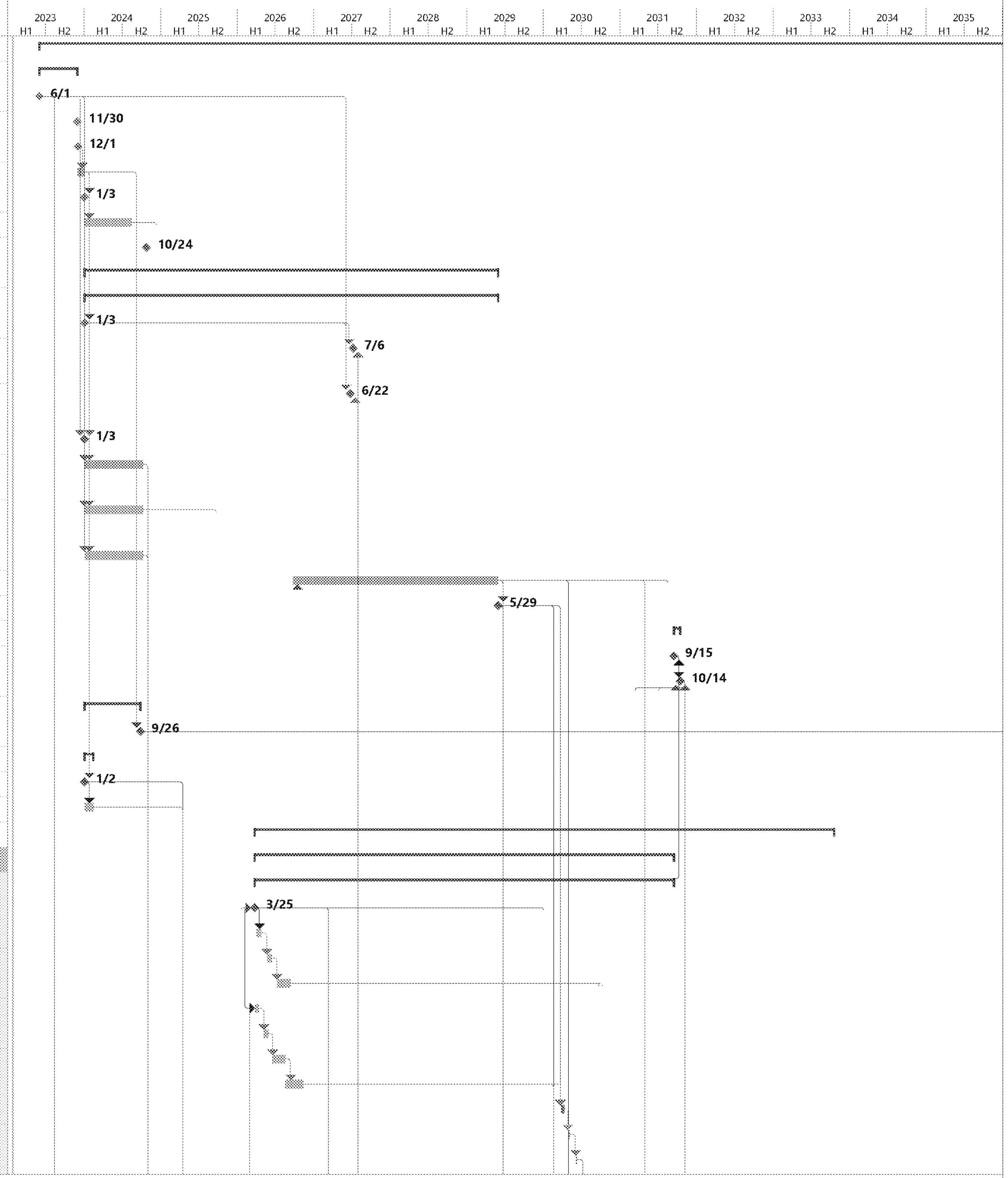
Number	Owner	County	Schedule Work Package 2-1/23 to 6/30/23
1	USA TCCA Government	Colusa	Work Package 2.01 - Start Timeframe of January 2023
2	GCID Canal APN, Owner Unknown	Colusa	Work Package 2.02 - Start Timeframe of February 2023
3	Colusa County Public Land	Colusa	Work Package 2.03 - Start Timeframe of March 2023
3	Red Stick Farms, Colusa County	Colusa	Work Package 2.04 - Start Timeframe of April 2023
4	Banyan Transport Systems, Colusa County	Colusa	Work Package 2.05 - Start Timeframe of May 2023

Number	Owner	County	Schedule Work Package 3 - 7/1/23 to 12/31/23
1	Wells, Colusa County	Colusa	Work Package 3.07 - Start Timeframe of
2	Owens, Glenn County	Glenn	Work Package 3.07 - Start Timeframe of
3	Holthouse, Colusa County	Colusa	Work Package 3.08 - Start Timeframe of
4	Tays Frank P & Marilyn E Family 15 Revoc Tr, Colusa County	Colusa	Work Package 3.09 - Start Timeframe of
5	Cody Arnold, Colusa County	Colusa	Work Package 3.10 - Start Timeframe of
6	GCID Canal APN, Owner Unknown	Colusa	Work Package 3.10 - Start Timeframe of
7	Jensen, Colusa County	Colusa	Work Package 3.11 - Start Timeframe of
8	USA TCCA Government	Yolo	Work Package 3.11 - Start Timeframe of
9	Yolo County Bird Creek Drainage	Yolo	Work Package 3.11 - Start Timeframe of
10	Mumma, Yolo County	Yolo	Work Package 3.12 - Start Timeframe of


Golden Gate Fnd 30% Design Package Submittal
Thu 3/28/24
2024
2025
2026
2027
2028
2029
2030
2031
2032
2033
2034
2035
2036
Start
Thu 6/1/23
Finish
Mon 7/21/36
Golden Gate Dam Design
Thu 8/31/23 - Tue 5/30/28
Golden Gate Dam Construction
Tue 6/1/32 - Mon 3/17/36
D...
Tu...
Critical La...
Wed 1/3/2...
EIR P2a Geotech Investi...
Wed 10/9/24 - Tue 3/24/26
Gold...
Wed...
Critical Path Land Acquisition
Wed 9/23/26 - Tue 5/29/29
CMAR Pr...
Wed 1/1/2...
Baseline Surveys and Revised ESA Consultation
Wed 3/25/26 - Mon 9/15/31
Pre...
Wed...
Compensatory Mi...
Fri 3/12/27 - Thu 5/...
Cultural...
Wed 5/30...
Testing a...
Wed 2/6/...
Develop Treat...
Wed 10/16/30 -...
Final Desi...
Wed 5/30/...
Northern Constr...
Wed 4/30/31 - M...
Ea...
We...
Final Desi...
Wed 5/30/...
Southern...
Wed 8/20/...
Filter Material Haul to Stockpile
Wed 5/19/32 - Tue 6/12/35
Final Design
Thu 8/29/24 -...
Pr...
W...
County Ro...
Wed 2/4/2...
Final EIR (Environmental Impact Report) CEQA Adoption
Thu 6/1/23
Final EIS (Environmental Impact Statement) NEPA ROD
Thu 11/30/23
Water Right Permit
Thu 9/26/24
Investor Commitment
Thu 10/24/24
Land Acquisition / Complete Access
Tue 5/29/29
Environmental Permitting and Certification
Tue 10/14/31
Substantial Completion
Mon 7/21/36

Rollup - Sites Reservoir, CP-1
DRAFT Conceptual Construction Schedule
HR Facilities - 1.5 MAF
Roadways and Dams
January 2023

ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	Successors
1		**Sites Reservoir - CP-1**	**3428 days**	**Thu 6/1/23**	**Mon 7/21/36**		
2		**Final EIR / EIS**	**130 days**	**Thu 6/1/23**	**Thu 11/30/23**		
3		Final EIR (Environmental Impact Report) CEQA Adoption	0 days	Thu 6/1/23	Thu 6/1/23		14,15,16,17,18,81
4		Final EIS (Environmental Impact Statement) NEPA ROD	0 days	Thu 11/30/23	Thu 11/30/23		
5		CWC Award of Funds	0 days	Fri 12/1/23	Fri 12/1/23		6
6		Sites Board Approval/NTP for Phase 3	23 days	Fri 12/1/23	Tue 1/2/24	5	7,12,27,25
7		Determine Engineering Procurement & Delivery Method	0 days	Wed 1/3/24	Wed 1/3/24	6	8
8		CMAR Solicitation and Procurement	8 mons	Wed 1/3/24	Tue 8/13/24	7	172
9		Investor Commitment	0 days	Thu 10/24/24	Thu 10/24/24		
10		**Real Estate**	**1410 days**	**Wed 1/3/24**	**Tue 5/29/29**		
11		**Land Access and Acquisition**	**1410 days**	**Wed 1/3/24**	**Tue 5/29/29**		
12		Authority Approval to Proceed with P2 Access (NTP)	0 days	Wed 1/3/24	Wed 1/3/24	6	16,17,18,13,14,15
13		Critical Land Acquisition - P2a Geotech (Dam Foundation & Grouting)	0 days	Tue 7/6/27	Tue 7/6/27	12,94	
14		Critical Land Acquisition - P2b Geotech Investigation (Dam Embankments)	0 days	Tue 6/22/27	Tue 6/22/27	12,117,3	
15		Critical Land Acquisition - P2a Geotech (Roads)	0 days	Wed 1/3/24	Wed 1/3/24	12,3	
16		Critical Land Access - P2a Geotech (Dam Foundation & Grouting)	200 days	Wed 1/3/24	Tue 10/8/24	12,3	82
17		Critical Land Acccess - P2b Geotech Investigation (Dam Embankments)	200 days	Wed 1/3/24	Tue 10/8/24	12,3	84
18		Critical Land Access - P2a Geotech (Roads)	200 days	Wed 1/3/24	Tue 10/8/24	12,3	83
19		Critical Path Land Acquisition	700 days	Wed 9/23/26	Tue 5/29/29	92	20,56,182FS-24 wks,192FS-24 wks,179,189
20		Land Acquisition / Complete Access	0 days	Tue 5/29/29	Tue 5/29/29	19	40,45,76
21		**Environmental**	**21 days**	**Mon 9/15/31**	**Tue 10/14/31**		
22		Environmental Surveys	0 mons	Mon 9/15/31	Mon 9/15/31	31	23
23		Environmental Permitting and Certification	0 mons	Tue 10/14/31	Tue 10/14/31	22,73,78	342,182FS-24 wks,192FS-8 wks
24		**Water**	**191 days**	**Tue 1/2/24**	**Thu 9/26/24**		
25		Water Right Permit	0 days	Thu 9/26/24	Thu 9/26/24	6	342
26		**Construction Water**	**30 days**	**Tue 1/2/24**	**Tue 2/13/24**		
27		Acquisition of Construction Water	0 days	Tue 1/2/24	Tue 1/2/24	6	175,28
28		Initial Development of Construction Water	30 days	Wed 1/3/24	Tue 2/13/24	27	175
29		**Sites Reservoir Permitting, Mitigation and Cultural Work**	**1974 days**	**Wed 3/25/26**	**Mon 10/17/33**		
30		**Permitting**	**1429 days**	**Wed 3/25/26**	**Mon 9/15/31**		
31		**Baseline Surveys and Revised ESA Consultation**	**1429 days**	**Wed 3/25/26**	**Mon 9/15/31**		**22**
32		Access Granted for Biological Surveys	0 days	Wed 3/25/26	Wed 3/25/26	92SS	33FS+7 days,59,36SS,73,75
33		Plant Survey 1	15 days	Fri 4/3/26	Thu 4/23/26	32FS+7 days	34FS+20 days
34		Plant Survey 2	15 days	Fri 5/22/26	Thu 6/11/26	33FS+20 days	35FS+20 days
35		Plant Survey 3 and Report	45 days	Fri 7/10/26	Thu 9/10/26	34FS+20 days	67,69
36		Land Cover Verification/Aquatic Delineation #1	15 days	Wed 3/25/26	Tue 4/14/26	32SS	52SS,37FS+15 days
37		Land Cover Verification/Aquatic Delineation #2	15 days	Wed 5/6/26	Tue 5/26/26	36FS+15 days	38FS+15 days
38		Land Cover Verification/Aquatic Delineation and R(	45 days	Wed 6/17/26	Tue 8/18/26	37FS+15 days	39
39		Revise Impact Acres and Work with Agencies	60 days	Wed 8/19/26	Tue 11/10/26	38	40,45
40		BUOW #1 (Burrowing Owls Study)	5 days	Mon 4/1/30	Fri 4/5/30	39,20	41FS+15 days
41		BUOW #2	5 days	Mon 4/29/30	Fri 5/3/30	40FS+15 days	42FS+20 days
42		BUOW #3	5 days	Mon 6/3/30	Fri 6/7/30	41FS+20 days	43FS+20 days



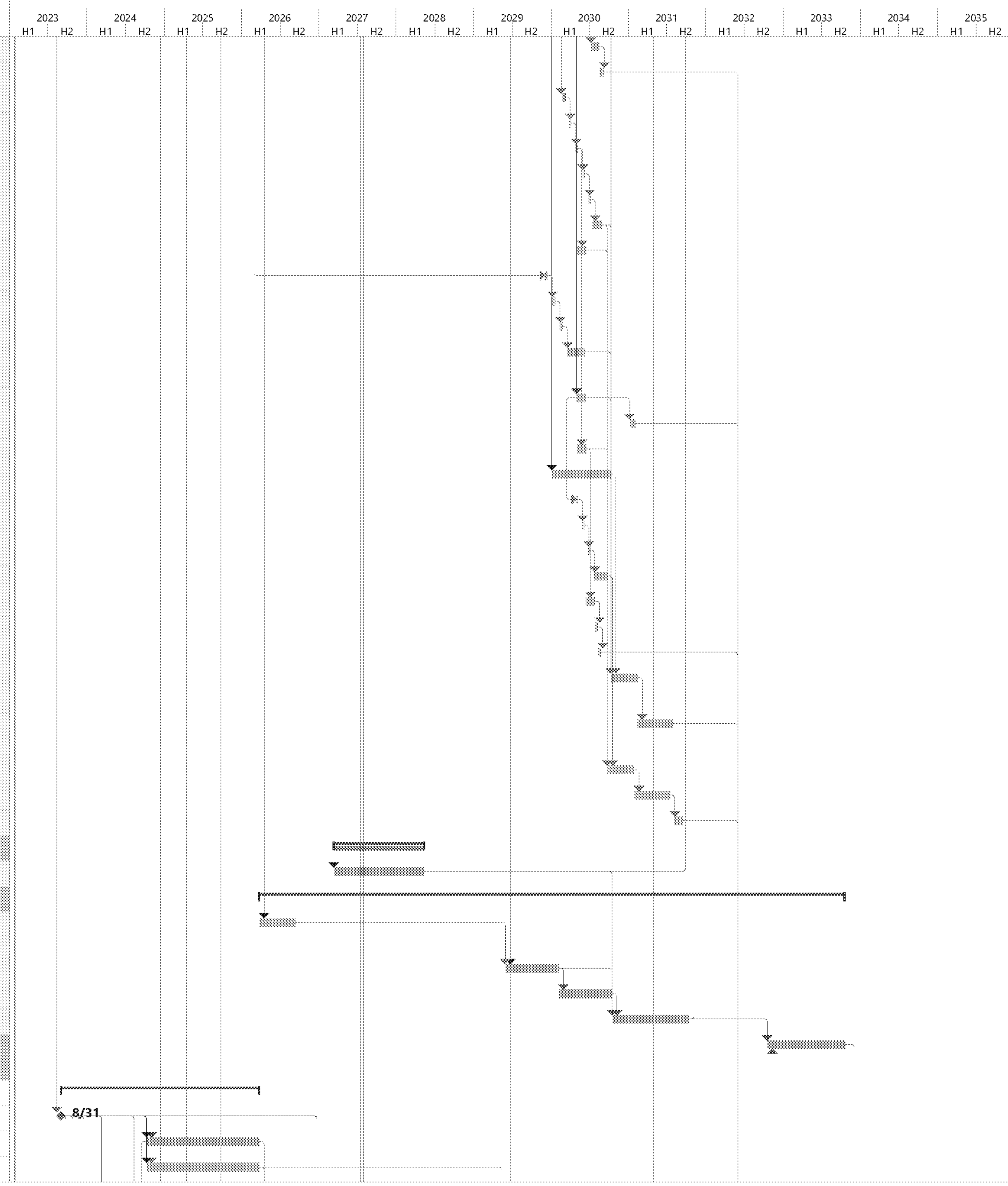
DRAFT Conceptual Construction Schedule Sites Reservoir CP-1.
14-Jan-2023

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

The dates, durations and sequencing shown are based on limited project information.
Additional information aquired, CMAR's approach to the work and other factors will result in a different approach to the work, sequencing, durations and dates.

Rollup - Sites Reservoir, CP-1
DRAFT Conceptual Construction Schedule
HR Facilities - 1.5 MAF
Roadways and Dams
January 2023

ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	Successors
43		BUOW #4 and Report	30 days	Mon 7/8/30	Fri 8/16/30	42FS+20 days	44
44		BUOW Relocation	15 days	Mon 8/19/30	Fri 9/6/30	43	321
45		SWHA #1 and TCBB #1	5 days	Fri 3/1/30	Thu 3/7/30	39,20	46FS+15 days
46		SWHA #2 and TCBB #2	5 days	Fri 3/29/30	Thu 4/4/30	45FS+15 days	47FS+15 days
47		SWHA #3 and TCBB #3	5 days	Fri 4/26/30	Thu 5/2/30	46FS+15 days	48FS+20 days,51,58
48		SWHA #4	5 days	Fri 5/31/30	Thu 6/6/30	47FS+20 days	49FS+15 days
49		SWHA #5	5 days	Fri 6/28/30	Thu 7/4/30	48FS+15 days	50FS+7 days
50		SWHA #6 and Report	30 days	Tue 7/16/30	Mon 8/26/30	49FS+7 days	67,69
51		TCBB Report	30 days	Fri 5/3/30	Thu 6/13/30	47	69
52		Vernal Pool Wet Season Survey 1	10 days	Mon 12/3/29	Fri 12/14/29	36SS	53FS+15 days
53		Vernal Pool Wet Season Survey 2	10 days	Mon 1/7/30	Fri 1/18/30	52FS+15 days	54FS+15 days
54		Vernal Pool Wet Season Survey 3	10 days	Mon 2/11/30	Fri 2/22/30	53FS+15 days	55FS+15 days
55		Vernal Pool Wet Season Survey 4 (more may be needed) and Report	60 days	Mon 3/18/30	Fri 6/7/30	54FS+15 days	67
56		VELB Survey and Report	30 days	Tue 4/30/30	Mon 6/10/30	19	57FS+150 days,67,60SS
57		VELB Transplant	20 days	Tue 1/7/31	Mon 2/3/31	56FS+150 days	321
58		Bank Swallow Survey and Report	30 days	Fri 5/3/30	Thu 6/13/30	47	64,69
59		CRLF Surveys and Report	200 days	Thu 1/3/30	Wed 10/9/30	32	67
60		Bumble Bee Survey 1	5 days	Tue 4/30/30	Mon 5/6/30	56SS	61FS+15 days
61		Bumble Bee Survey 2	5 days	Tue 5/28/30	Mon 6/3/30	60FS+15 days	62FS+15 days
62		Bumble Bee Survey 3	5 days	Tue 6/25/30	Mon 7/1/30	61FS+15 days	63FS+15 days
63		Bumble Bee Survey 4 and Report	45 days	Tue 7/23/30	Mon 9/23/30	62FS+15 days	69
64		Badger Survey and Report	30 days	Fri 6/14/30	Thu 7/25/30	58	65
65		Bat Survey (Roosts)	10 days	Fri 7/26/30	Thu 8/8/30	64	66
66		Bat Roosts Removal	10 days	Fri 8/9/30	Thu 8/22/30	65	321
67		USFWS - Amend ESA Consultation: Prepare Report and Submit	90 days	Thu 10/10/30	Wed 2/12/31	35,50,55,56,59	68
68		USFWS Review and Amend ESA Permit and Take Statement	120 days	Thu 2/13/31	Wed 7/30/31	67	321
69		CDFW - Amend ESA ITP: Prepare Report and Submi	90 days	Tue 9/24/30	Mon 1/27/31	35,50,51,58,63	70
70		CDFW Review Report and Ament ITP Take Stateme	120 days	Tue 1/28/31	Mon 7/14/31	69	71FS+15 days
71		Precon Avoidance (GGS, Avian, mammal, other CE(	30 days	Tue 8/5/31	Mon 9/15/31	70FS+15 days	321
72		**Compensatory Mitigation**	**305 days**	**Fri 3/12/27**	**Thu 5/11/28**		
73		Secure LOC/Implement Mitigation Prior to Take	305 days	Fri 3/12/27	Thu 5/11/28	32	78,23
74		**Cultural Work**	**1974 days**	**Wed 3/25/26**	**Mon 10/17/33**		
75		Prepare and Consult on Construction Phase Work Plan (per Section 106 PA)	120 days	Wed 3/25/26	Tue 9/8/26	32	76
76		Cultural Survey - with Fee Title	180 days	Wed 5/30/29	Tue 2/5/30	75,20	77,78
77		Testing and Evaluation of Resources	180 days	Wed 2/6/30	Tue 10/15/30	76	78
78		Develop Treatment Plan and Implementation	260 days	Wed 10/16/30	Tue 10/14/31	76,73,77	79,23
79		Implement Avoidance/Minimization Activities During Construction	260 days	Tue 10/19/32	Mon 10/17/33	78,321	325FF
80		**P1 / P2 Geotech Investigations**	**669 days**	**Thu 8/31/23**	**Tue 3/24/26**		
81		P1 Geotech Investigation (30% Cutoff)	0 days	Thu 8/31/23	Thu 8/31/23	3	101,112,137,149,209,89,124,160,100,111,136,148,82,83,184FS+52 wks
82		EIR P2a Geotech Investigation (Dam Foundations & Gro	76 wks	Wed 10/9/24	Tue 3/24/26	16,81	92,127,139,103,84SS+50 wks,163
83		EIR P2a Geotech Investigation (Roads)	76 wks	Wed 10/9/24	Tue 3/24/26	81,18	179,189,194,199,204



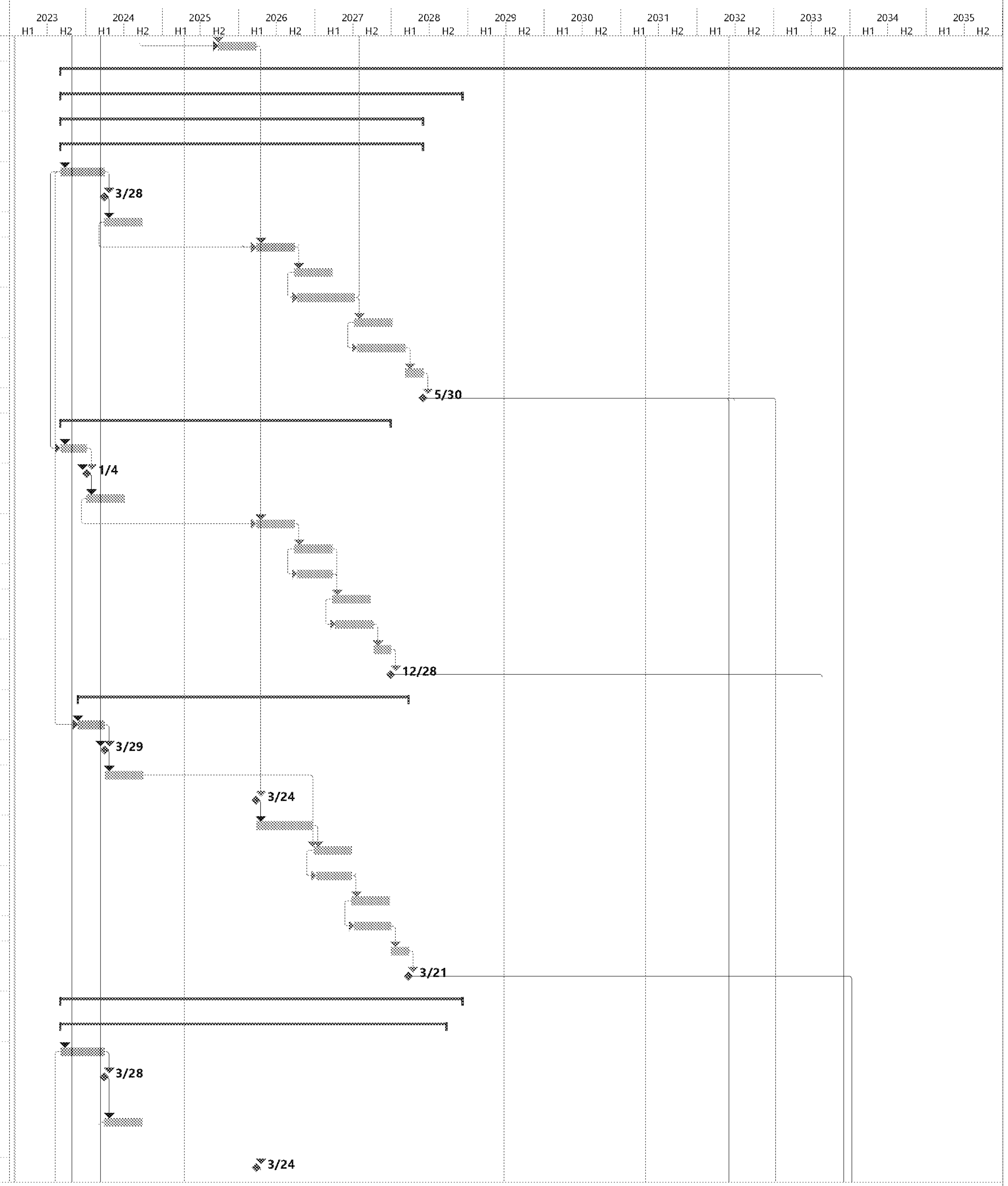
DRAFT Conceptual Construction Schedule Sites Reservoir CP-1.
14-Jan-2023

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

The dates, durations and sequencing shown are based on limited project information.
Additional information aquired, CMAR's approach to the work and other factors will result in a different approach to the work, sequencing, durations and dates.

Rollup - Sites Reservoir, CP-1
DRAFT Conceptual Construction Schedule
HR Facilities - 1.5 MAF
Roadways and Dams
January 2023

ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	Successors
84		EIR P2b Geotech Investigation (Dam Embankments)	26 wks	Wed 9/24/25	Tue 3/24/26	17,82SS+50 wks	151,114,163
85		**Reservoir Facilities**	**3363 days**	**Thu 8/31/23**	**Mon 7/21/36**		
86		**Engineering - Dams**	**1374 days**	**Thu 8/31/23**	**Tue 12/5/28**		
87		**Golden Gate Dam Design**	**1239 days**	**Thu 8/31/23**	**Tue 5/30/28**		
88		**Golden Gate Foundation Design**	**1239 days**	**Thu 8/31/23**	**Tue 5/30/28**		
89		Golden Gate Foundation 30% Design	151 days	Thu 8/31/23	Thu 3/28/24	81	90,100SS,111SS+200 days
90		Golden Gate Fnd 30% Design Package Submittal	0 days	Thu 3/28/24	Thu 3/28/24	89	91
91		DSOD Review of GG Fdn 30% Design	26 wks	Fri 3/29/24	Thu 9/26/24	90	92SS+10 days
92		Golden Gate Foundation 60% Design	26 wks	Wed 3/25/26	Tue 9/22/26	82,91SS+10 days	93,32SS,19
93		DSOD Review of GG Fdn 60% Design	26 wks	Wed 9/23/26	Tue 3/23/27	92	94SS+10 days
94		Golden Gate Foundation 90% Design	39 wks	Wed 10/7/26	Tue 7/6/27	93SS+10 days	95,13
95		DSOD Review of GG Fdn 90% Design	26 wks	Wed 7/7/27	Tue 1/4/28	94	96SS+10 days
96		GG Foundation 100% Design	33 wks	Wed 7/21/27	Tue 3/7/28	95SS+10 days	97
97		DSOD Review of GG 100% Foundation Design Pa	12 wks	Wed 3/8/28	Tue 5/30/28	96	98
98		GG Foundation DSOD Approval Received	0 days	Tue 5/30/28	Tue 5/30/28	97	321,325,294,240
99		**Golden Gate Grouting Design**	**1129 days**	**Thu 8/31/23**	**Tue 12/28/27**		
100		Golden Gate Grouting 30% Design	91 days	Thu 8/31/23	Thu 1/4/24	89SS,81	101
101		Golden Gate Grouting Design Package Submittal	0 days	Thu 1/4/24	Thu 1/4/24	81,100	102
102		DSOD Review of GG Grouting 30% Design	26 wks	Fri 1/5/24	Thu 7/4/24	101	103SS+10 days
103		Golden Gate Grouting 60% Design	26 wks	Wed 3/25/26	Tue 9/22/26	102SS+10 days,82	104
104		DSOD Review of GG Grouting 60% Design	26 wks	Wed 9/23/26	Tue 3/23/27	103	105SS+10 days,106
105		Golden Gate Grouting 90% Design	24 wks	Wed 10/7/26	Tue 3/23/27	104SS+10 days	106
106		DSOD Review of GG Grouting 90% Design	26 wks	Wed 3/24/27	Tue 9/21/27	105,104	107SS+10 days
107		GG Grouting 100% Design	26 wks	Wed 4/7/27	Tue 10/5/27	106SS+10 days	108
108		DSOD Review of GG 100% Grouting Design Pack	12 wks	Wed 10/6/27	Tue 12/28/27	107	109
109		GG Grouting DSOD Approval Received	0 days	Tue 12/28/27	Tue 12/28/27	108	330
110		**Golden Gate Embankment Design**	**1128 days**	**Fri 11/24/23**	**Tue 3/21/28**		
111		Golden Gate Embankment 30% Design	91 days	Fri 11/24/23	Fri 3/29/24	81,89SS+200 days	112
112		Golden Gate Embankment Design Package Subm	0 days	Fri 3/29/24	Fri 3/29/24	111,81	113
113		DSOD Review of GG Embankment 30% Design	26 wks	Mon 4/1/24	Fri 9/27/24	112	116
114		Golden Gate Borrow and Quarry Geotech Data	0 days	Tue 3/24/26	Tue 3/24/26	84	115
115		Golden Gate Embankment 60% Design	39 wks	Wed 3/25/26	Tue 12/22/26	114	116,209
116		DSOD Review of GG Embankment 60% Design	26 wks	Wed 12/23/26	Tue 6/22/27	115,113	117SS+10 days
117		Golden Gate Embankment 90% Design	24 wks	Wed 1/6/27	Tue 6/22/27	116SS+10 days	118,14
118		DSOD Review of GG Embankment 90% Design	26 wks	Wed 6/23/27	Tue 12/21/27	117	119SS+10 days
119		GG Embankment 100% Design	25 wks	Wed 7/7/27	Tue 12/28/27	118SS+10 days	120
120		DSOD Review of GG 100% Embankment Design I	12 wks	Wed 12/29/27	Tue 3/21/28	119	121
121		GG Embankment DSOD Approval Received	0 days	Tue 3/21/28	Tue 3/21/28	120	336,337,338,339
122		**Sites Dam Design**	**1374 days**	**Thu 8/31/23**	**Tue 12/5/28**		
123		**Sites Dam Foundation and Outlet Design**	**1319 days**	**Thu 8/31/23**	**Tue 9/19/28**		
124		Sites Dam Foundation and Outlet 30% Design	151 days	Thu 8/31/23	Thu 3/28/24	81	125,136SS+100 days
125		Sites Dam Foundation and Outlet Design Package Submittal	0 days	Thu 3/28/24	Thu 3/28/24	124	126
126		DSOD Review of Sites Dam Foundation and Outlet 30% Design	26 wks	Fri 3/29/24	Thu 9/26/24	125	128SS+10 days
127		Sites Dam Foundation and Outlet Geotech Data	0 days	Tue 3/24/26	Tue 3/24/26	82	128,152



DRAFT Conceptual Construction Schedule Sites Reservoir CP-1.
14-Jan-2023

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

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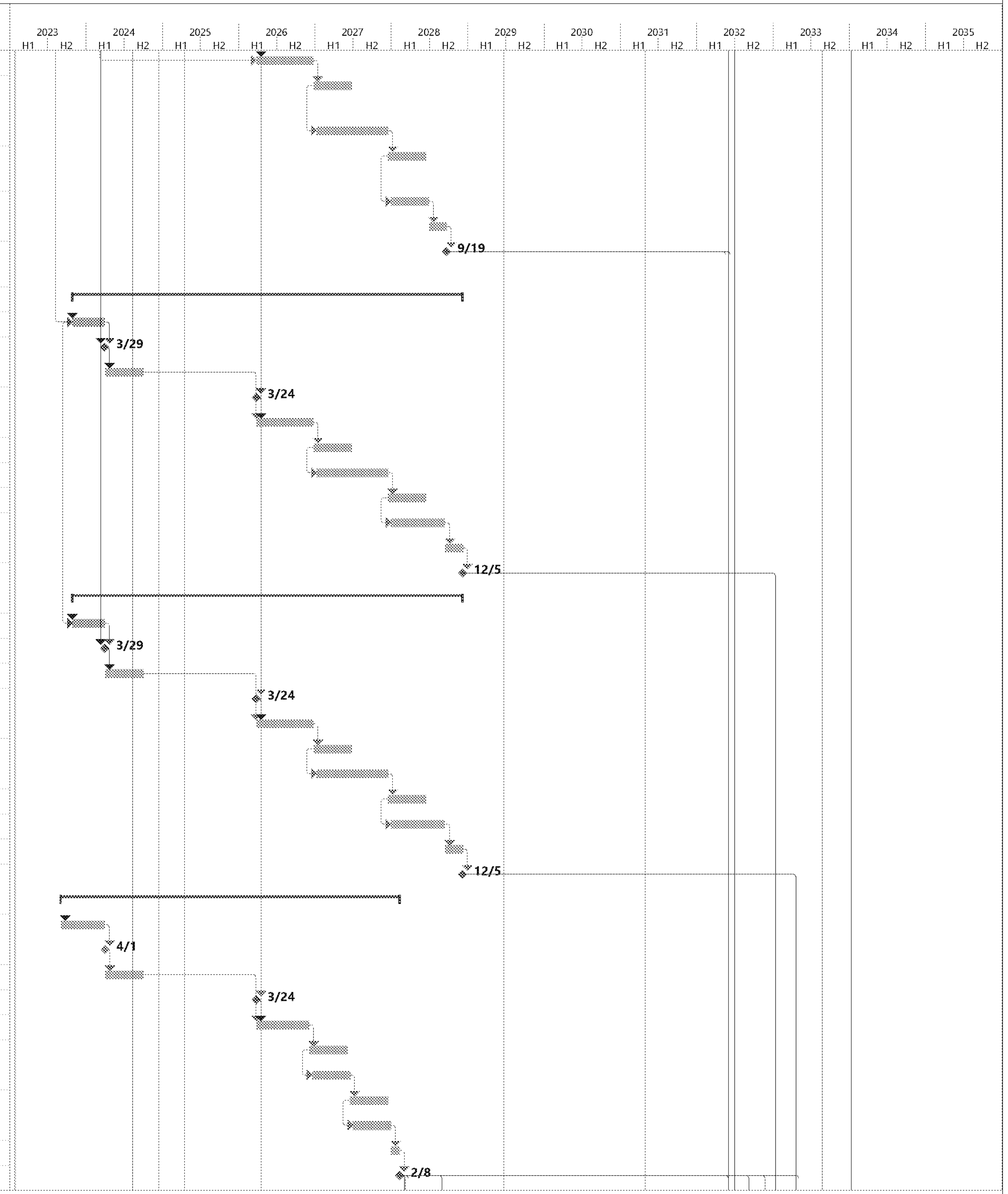
Rollup - Sites Reservoir, CP-1
DRAFT Conceptual Construction Schedule
HR Facilities - 1.5 MAF
Roadways and Dams
January 2023

ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	Successors
128		Sites Dam Foundation and Outlet 60% Design	39 wks	Wed 3/25/26	Tue 12/22/26	127,126SS+10 days	129
129		DSOD Review of Sites Dam Foundation and Outlet 60% Design	26 wks	Wed 12/23/26	Tue 6/22/27	128	130SS+10 days
130		Sites Dam Foundation and Outlet 90% Design	49 wks	Wed 1/6/27	Tue 12/14/27	129SS+10 days	131
131		DSOD Review of Sites Dam Foundation and Outlet 90% Design	26 wks	Wed 12/15/27	Tue 6/13/28	130	132SS+10 days
132		Sites Dam Foundation and Outlet 100% Design	26 wks	Wed 12/29/27	Tue 6/27/28	131SS+10 days	133
133		DSOD Review of Sites 100% Foundation and Out	12 wks	Wed 6/28/28	Tue 9/19/28	132	134
134		Sites Dam Foundation and Outlet DSOD Approval Received	0 days	Tue 9/19/28	Tue 9/19/28	133	290,296
135		**Sites Dam Grouting Design**	**1333 days**	**Fri 10/27/23**	**Tue 12/5/28**		
136		Sites Dam Grouting 30% Design	111 days	Fri 10/27/23	Fri 3/29/24	81,124SS+100 days	137,148SS+100 days
137		Sites Dam Grouting Design Package Submittal	0 days	Fri 3/29/24	Fri 3/29/24	81,136	138
138		DSOD Review of Sites Dam Grouting 30% Design	26 wks	Mon 4/1/24	Fri 9/27/24	137	140
139		Sites Dam Grouting Geotech Data	0 days	Tue 3/24/26	Tue 3/24/26	82	140
140		Sites Dam Grouting 60% Design	39 wks	Wed 3/25/26	Tue 12/22/26	139,138	141
141		DSOD Review of Sites Dam Grouting 60% Design	26 wks	Wed 12/23/26	Tue 6/22/27	140	142SS+10 days
142		Sites Dam Grouting 90% Design	49 wks	Wed 1/6/27	Tue 12/14/27	141SS+10 days	143
143		DSOD Review of Sites Dam Grouting 90% Design	26 wks	Wed 12/15/27	Tue 6/13/28	142	144SS+10 days
144		Sites Dam Grouting 100% Design	37 wks	Wed 12/29/27	Tue 9/12/28	143SS+10 days	145
145		DSOD Review of Sites 100% Grouting Design Pac	12 wks	Wed 9/13/28	Tue 12/5/28	144	146
146		Sites Dam Grouting DSOD Approval Received	0 days	Tue 12/5/28	Tue 12/5/28	145	307
147		**Sites Dam Embankment Design**	**1333 days**	**Fri 10/27/23**	**Tue 12/5/28**		
148		Sites Dam Embankment 30% Design	111 days	Fri 10/27/23	Fri 3/29/24	81,136SS+100 days	149
149		Sites Dam Embankment Design Package Submitt	0 days	Fri 3/29/24	Fri 3/29/24	81,148	150
150		DSOD Review of Sites Dam Embankment 30% De	26 wks	Mon 4/1/24	Fri 9/27/24	149	152
151		Sites Dam Borrow and Quarry Geotech Data	0 days	Tue 3/24/26	Tue 3/24/26	84	152
152		Sites Dam Embankment 60% Design	39 wks	Wed 3/25/26	Tue 12/22/26	127,151,150	153
153		DSOD Review of Sites Dam Embankment 60% De	26 wks	Wed 12/23/26	Tue 6/22/27	152	154SS+10 days
154		Sites Dam Embankment 90% Design	49 wks	Wed 1/6/27	Tue 12/14/27	153SS+10 days	155
155		DSOD Review of Sites Dam Embankment 90% De	26 wks	Wed 12/15/27	Tue 6/13/28	154	156SS+10 days
156		Sites Dam Embankment 100% Design	37 wks	Wed 12/29/27	Tue 9/12/28	155SS+10 days	157
157		DSOD Review of Sites 100% Embankment Desigr	12 wks	Wed 9/13/28	Tue 12/5/28	156	158
158		Sites Dam Embankment DSOD Approval Receive	0 days	Tue 12/5/28	Tue 12/5/28	157	313,314,315,316
159		**Saddle Dam Designs**	**1159 days**	**Thu 8/31/23**	**Tue 2/8/28**		
160		Saddle Dams 30% Design	151 days	Thu 8/31/23	Thu 3/28/24	81	161
161		Saddle Dams 30% Design Package Submittal	0 days	Mon 4/1/24	Mon 4/1/24	160	162
162		Saddle Dams DSOD Review of 30% Design	26 wks	Mon 4/1/24	Fri 9/27/24	161	164
163		Saddle Dams Borrow and Quarry Geotech Data	0 days	Tue 3/24/26	Tue 3/24/26	82,84	164
164		Saddle Dams 60% Design	36 wks	Wed 3/25/26	Tue 12/1/26	163,162	165
165		Saddle Dams DSOD Review of 60% Design	26 wks	Wed 12/2/26	Tue 6/1/27	164	166SS+10 days
166		Saddle Dams 90% Design	26 wks	Wed 12/16/26	Tue 6/15/27	165SS+10 days	167
167		Saddle Dams DSOD Review of 90% Design	26 wks	Wed 6/16/27	Tue 12/14/27	166	168SS+10 days
168		Saddle Dams 100% Design	26 wks	Wed 6/30/27	Tue 12/28/27	167SS+10 days	169
169		DSOD Review of 100% Package	6 wks	Wed 12/29/27	Tue 2/8/28	168	170
170		Saddle Dams DSOD Approval Received	0 days	Tue 2/8/28	Tue 2/8/28	169	215,236,257,277,219,228,229,230,231,261,270,249,271,272,273,278



DRAFT Conceptual Construction Schedule Sites Reservoir CP-1.
14-Jan-2023

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

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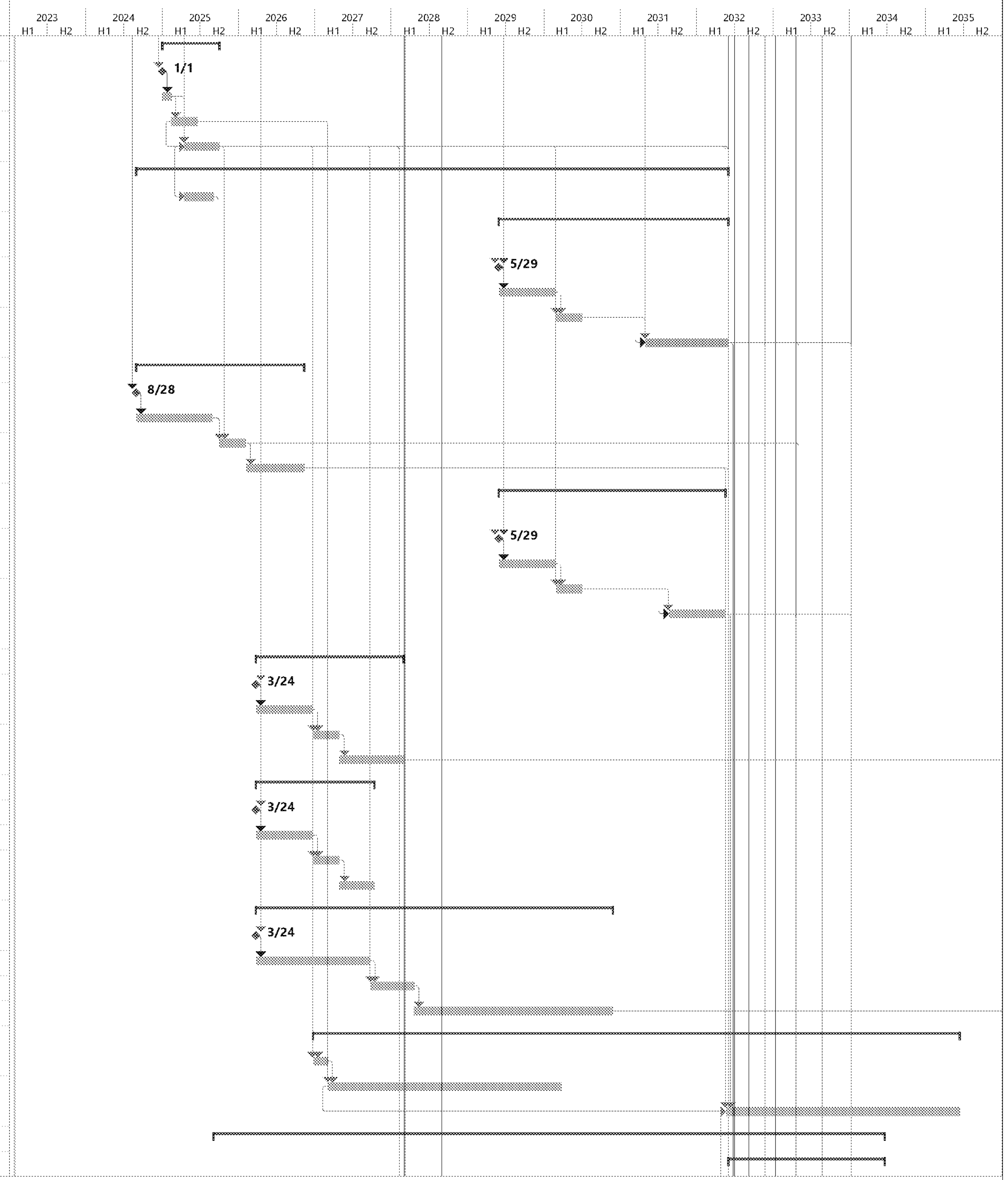
Rollup - Sites Reservoir, CP-1
DRAFT Conceptual Construction Schedule
HR Facilities - 1.5 MAF
Roadways and Dams
January 2023

ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	Successors
171		**CMAR Procurement**	**195 days**	**Wed 1/1/25**	**Tue 9/30/25**		
172		Award CMAR Contract	0 days	Wed 1/1/25	Wed 1/1/25	8	173
173		Notice to Proceed	6 wks	Wed 1/1/25	Tue 2/11/25	172	175,174
174		Early Submittals And Approvals - Dams	90 days	Wed 2/12/25	Tue 6/17/25	173	210,175SS+45 days
175		CMAR Mobilization	6 mons	Wed 4/16/25	Tue 9/30/25	173,174SS+45 days,27,28	321,290,215,236,257,191,177SS,181,186,196,201,206,209
176		**Roads, Bridges, Access, and Site Development**	**2023 days**	**Wed 8/28/24**	**Mon 5/31/32**		
177		Early Site Access and Staging Development	100 days	Wed 4/16/25	Tue 9/2/25	175SS	287
178		**Northern Construction Access Roads (CR 68, CR 69, N. Rd)**	**784 days**	**Tue 5/29/29**	**Mon 5/31/32**		
179		Geotechnical Data	0 days	Tue 5/29/29	Tue 5/29/29	83,19	180
180		Final Design	39 wks	Wed 5/30/29	Tue 2/26/30	179	181
181		Procurement and NTP	90 days	Wed 2/27/30	Tue 7/2/30	175,180	182
182		Northern Construction Access Roads (CR 68, CR 69,	284 days	Wed 4/30/31	Mon 5/31/32	181,19FS-24 wks,23FS-24	337,229,250,271,321,236,215
183		**County Roads F, D, McDermott, Delevan**	**574 days**	**Wed 8/28/24**	**Tue 11/10/26**		
184		Geotechnical Data	0 days	Wed 8/28/24	Wed 8/28/24	81FS+52 wks	185
185		Final Design	52 wks	Thu 8/29/24	Wed 8/27/25	184	186
186		Procurement and NTP	90 days	Wed 10/1/25	Tue 2/3/26	175,185	229,250,271,187
187		County Roads F, D, McDermott, Delevan	200 days	Wed 2/4/26	Tue 11/10/26	186	211,321
188		**Southern Construction Access Roads (Maxwell-Sites, Shoo-fly, A-1)**	**775 days**	**Tue 5/29/29**	**Tue 5/18/32**		
189		Geotechnical Data	0 days	Tue 5/29/29	Tue 5/29/29	83,19	190
190		Final Design	39 wks	Wed 5/30/29	Tue 2/26/30	189	191
191		Procurement and NTP	90 days	Wed 2/27/30	Tue 7/2/30	175,190	192
192		Southern Construction Access Roads (Maxwell-Sites, Shoo-fly, A-1)	195 days	Wed 8/20/31	Tue 5/18/32	191,19FS-24 wks,23FS-8 wks	290,337,314,211
193		**Ancillary Roads B1, B2, C1, C2, Comm N., Comm Sou**	**505 days**	**Tue 3/24/26**	**Tue 2/29/28**		
194		Geotechnical Data	0 days	Tue 3/24/26	Tue 3/24/26	83	195
195		Final Design	39 wks	Wed 3/25/26	Tue 12/22/26	194	196
196		Procurement and NTP	90 days	Wed 12/23/26	Tue 4/27/27	175,195	197
197		Ancillary Roads B1, B2, C1, C2, Comm N., Comm So	220 days	Wed 4/28/27	Tue 2/29/28	196	342
198		**Stone Corral Recreation Road to Sites Dam**	**405 days**	**Tue 3/24/26**	**Tue 10/12/27**		
199		Geotechnical Data	0 days	Tue 3/24/26	Tue 3/24/26	83	200
200		Final Design	39 wks	Wed 3/25/26	Tue 12/22/26	199	201
201		Procurement and NTP	90 days	Wed 12/23/26	Tue 4/27/27	175,200	202
202		Stone Corral Recreation Road to Sites Dam	120 days	Wed 4/28/27	Tue 10/12/27	201	342
203		**Sites Lodoga Road Realignment and Bridge**	**1220 days**	**Tue 3/24/26**	**Tue 11/26/30**		
204		Geotechnical Data	0 days	Tue 3/24/26	Tue 3/24/26	83	205
205		Final Design	78 wks	Wed 3/25/26	Tue 9/21/27	204	206
206		Procurement and NTP	150 days	Wed 9/22/27	Tue 4/18/28	175,205	207
207		Sites Lodoga Road Realignment and Bridge	680 days	Wed 4/19/28	Tue 11/26/30	206	342
208		**Process and Haul Filter Materials to Project**	**2210 days**	**Wed 12/23/26**	**Tue 6/12/35**		
209		Offsite Quarry Development	50 days	Wed 12/23/26	Tue 3/2/27	81,115,175	210
210		Process Filter Materials	800 days	Wed 3/3/27	Tue 3/26/30	174,209	211SS+30 days
211		Filter Material Haul to Stockpile	800 days	Wed 5/19/32	Tue 6/12/35	210SS+30 days,187,192	337SS+30 days,314SS+30 days,229SS+30 days,250SS+30 days
212		**Saddle Dams Construction**	**2294 days**	**Wed 9/3/25**	**Mon 6/19/34**		
213		**Saddle Dam 3**	**535 days**	**Tue 6/1/32**	**Mon 6/19/34**		



DRAFT Conceptual Construction Schedule Sites Reservoir CP-1.
14-Jan-2023

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

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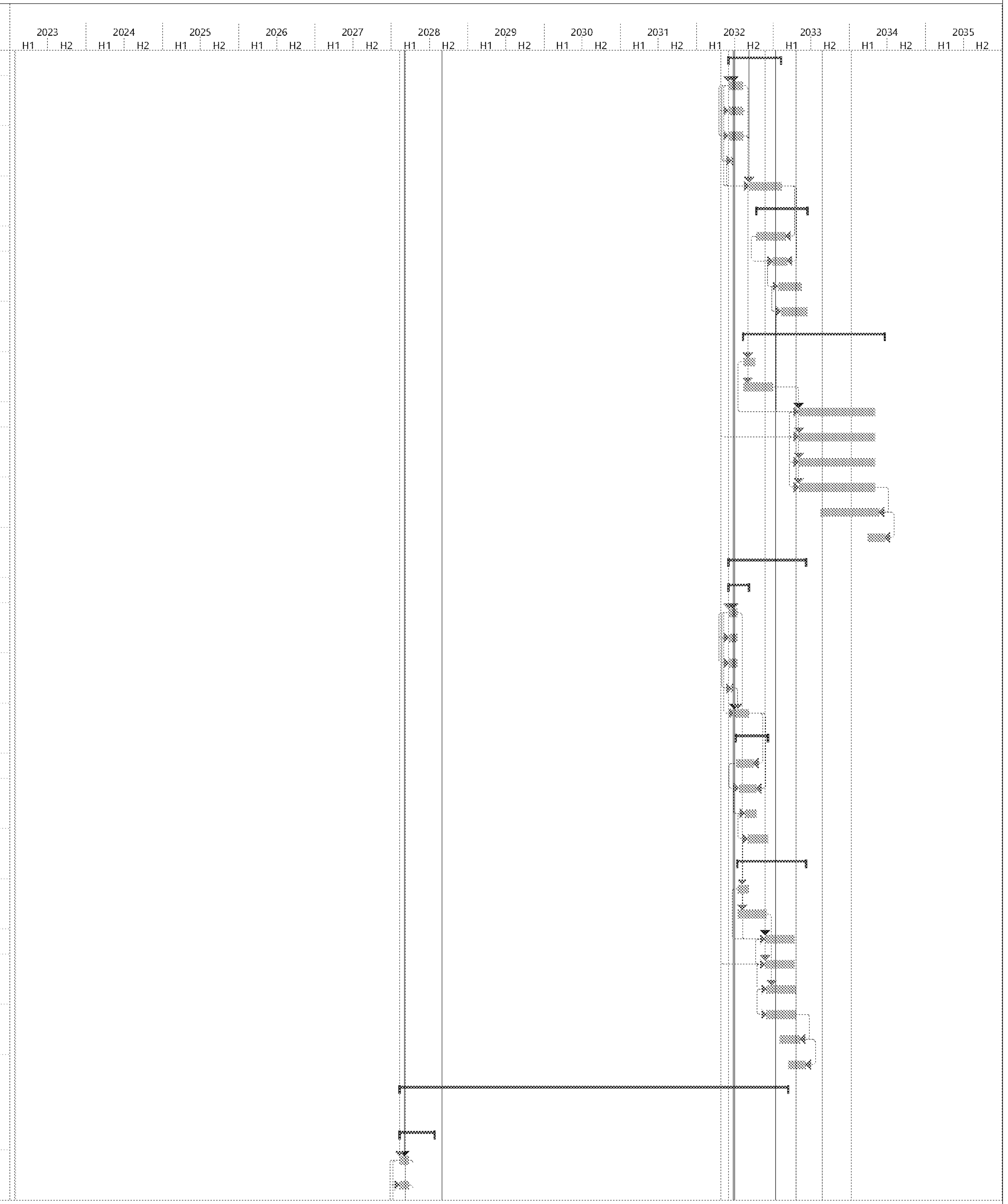
Rollup - Sites Reservoir, CP-1
DRAFT Conceptual Construction Schedule
HR Facilities - 1.5 MAF
Roadways and Dams
January 2023

ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	Successors
214		**Saddle Dam 3 Foundation Excavation**	**180 days**	**Tue 6/1/32**	**Mon 2/7/33**		
215		Saddle Dam 3 - Access and Staging	50 days	Tue 6/1/32	Mon 8/9/32	170,175,182	216SS,218SS+10 days,217SS,226,227,219SS+20 days
216		Erosion and Sediment Control	50 days	Tue 6/1/32	Mon 8/9/32	215SS	219SS+20 days,226,227
217		Clearing / Grubbing Topsoil Salvage from Work A	50 days	Tue 6/1/32	Mon 8/9/32	215SS	219FS+20 days,226,227
218		Demolition	5 days	Tue 6/15/32	Mon 6/21/32	215SS+10 days	219SS+20 days
219		Saddle Dam 3 - Foundation Excavation (Dbl Shift	110 days	Tue 9/7/32	Mon 2/7/33	215SS+20 days,216SS+20	221FF+15 days,222FF+20 days
220		**Saddle Dam 3 - Foundation Preparation and Grout**	**175 days**	**Tue 10/12/32**	**Mon 6/13/33**		
221		Foundation Cleaning	100 days	Tue 10/12/32	Mon 2/28/33	219FF+15 days	222SS+10 days
222		Dental Excavation and Concrete	50 days	Tue 12/28/32	Mon 3/7/33	219FF+20 days,221SS+10	223SS+20 days
223		Grout Cap	80 days	Tue 1/25/33	Mon 5/16/33	222SS+20 days	224SS+10 days
224		Curtain Grouting	90 days	Tue 2/8/33	Mon 6/13/33	223SS+10 days	228SS+60 days
225		**Saddle Dam 3 - Embankment**	**485 days**	**Tue 8/10/32**	**Mon 6/19/34**		
226		Initial Borrow Development (Core Material)	40 days	Tue 8/10/32	Mon 10/4/32	215,216,217	228SS+20 days
227		Initial Borrow Development for Zones 3 and 4	100 days	Tue 8/10/32	Mon 12/27/32	215,216,217	230,231
228		Place Zone 1 - Core	260 days	Tue 5/3/33	Mon 5/1/34	226SS+20 days,224SS+60	229SS
229		Place Zone 2A & 2B - Filters, Drains and Transitic	260 days	Tue 5/3/33	Mon 5/1/34	228SS,182,186,170,211SS	230SS
230		Place Zone 3 - Rockfill	260 days	Tue 5/3/33	Mon 5/1/34	229SS,227,170	231SS
231		Place Zone 4 - Random	260 days	Tue 5/3/33	Mon 5/1/34	230SS,227,170	232FF+15 days
232		Place Rip Rap	200 days	Tue 8/16/33	Mon 5/22/34	231FF+15 days	233FF+20 days
233		Site Reclamation and Topsoil Replacement	60 days	Tue 3/28/34	Mon 6/19/34	232FF+20 days	342
234		**Saddle Dam 5**	**265 days**	**Tue 6/1/32**	**Mon 6/6/33**		
235		**Saddle Dam 5 - Foundation Excavation**	**70 days**	**Tue 6/1/32**	**Mon 9/6/32**		
236		Saddle Dam 5 - Access and Staging	30 days	Tue 6/1/32	Mon 7/12/32	170,175,182	239SS+10 days,237SS,238SS,240SS+20 days,247,248
237		Erosion and Sediment Control	30 days	Tue 6/1/32	Mon 7/12/32	236SS	240SS+20 days
238		Clearing / Grubbing Topsoil Salvage from Work A	30 days	Tue 6/1/32	Mon 7/12/32	236SS	240SS+20 days
239		Demolition	5 days	Tue 6/15/32	Mon 6/21/32	236SS+10 days	240
240		Saddle Dam 5 - Foundation Excavation	50 days	Tue 6/29/32	Mon 9/6/32	236SS+20 days,237SS+20	242FF+15 days,243FF+15 days
241		**Saddle Dam 5 - Foundation Preparation and Grout**	**110 days**	**Tue 7/6/32**	**Mon 12/6/32**		
242		Foundation Cleaning	60 days	Tue 7/6/32	Mon 9/27/32	240FF+15 days	243SS+10 days
243		Dental Excavation and Concrete	60 days	Tue 7/20/32	Mon 10/11/32	240FF+15 days,242SS+10	244SS+20 days
244		Grout Cap	40 days	Tue 8/17/32	Mon 10/11/32	243SS+20 days	245SS+10 days
245		Curtain Grouting	70 days	Tue 8/31/32	Mon 12/6/32	244SS+10 days	249SS+60 days
246		**Saddle Dam 5 - Embankment**	**235 days**	**Tue 7/13/32**	**Mon 6/6/33**		
247		Initial Borrow Development (Core Material)	40 days	Tue 7/13/32	Mon 9/6/32	236	249SS+20 days
248		Initial Borrow Development for Zones 3 and 4	100 days	Tue 7/13/32	Mon 11/29/32	236	251
249		Place Zone 1 - Core	100 days	Tue 11/23/32	Mon 4/11/33	245SS+60 days,247SS+20	250SS
250		Place Zone 2A & 2B - Filters, Drains and Transitic	100 days	Tue 11/23/32	Mon 4/11/33	249SS,182,186,211SS+30	251SS
251		Place Zone 3 - Rockfill	100 days	Tue 11/30/32	Mon 4/18/33	250SS,248	252SS
252		Place Zone 4 - Random	100 days	Tue 11/30/32	Mon 4/18/33	251SS	253FF+15 days
253		Place Rip Rap	70 days	Tue 2/1/33	Mon 5/9/33	252FF+15 days	254FF+20 days
254		Site Reclamation and Topsoil Replacement	60 days	Tue 3/15/33	Mon 6/6/33	253FF+20 days	342
255		**Minor Saddle Dams (SD1,SD2,SD6,SD8A, Dike 1, and Dike 2)**	**1329 days**	**Wed 2/9/28**	**Mon 3/14/33**		
256		**Minor Saddle Dams Foundation Excavation**	**120 days**	**Wed 2/9/28**	**Tue 7/25/28**		
257		Minor Saddle Dams - Access and Staging	30 days	Wed 2/9/28	Tue 3/21/28	170,175	258SS,260SS+10 days,259SS,268,269,277,278,261SS+20 days
258		Erosion and Sediment Control	30 days	Wed 2/9/28	Tue 3/21/28	257SS	261SS+20 days,268,269,278



DRAFT Conceptual Construction Schedule Sites Reservoir CP-1.
14-Jan-2023

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

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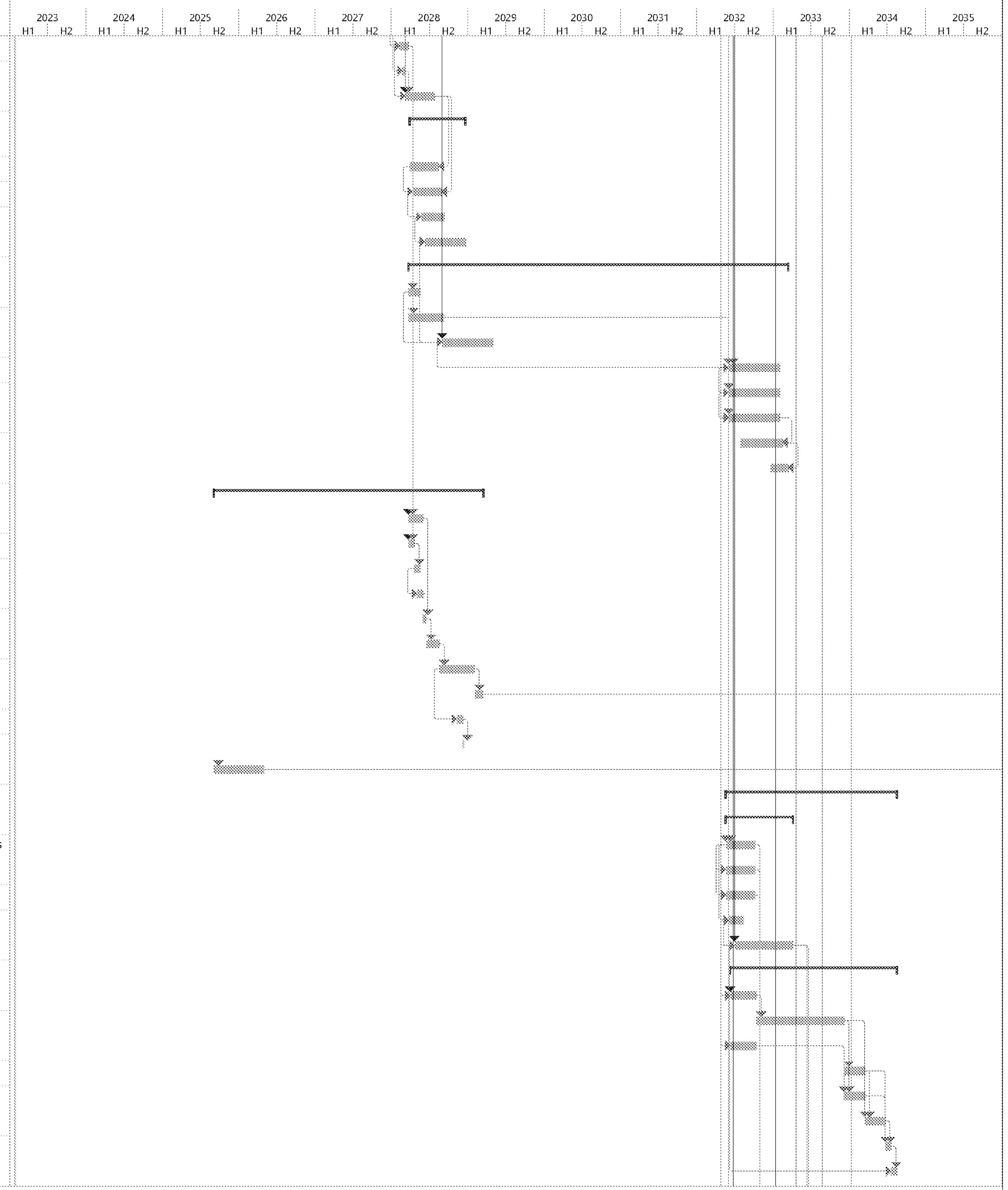
Rollup - Sites Reservoir, CP-1
DRAFT Conceptual Construction Schedule
HR Facilities - 1.5 MAF
Roadways and Dams
January 2023

ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	Successors
259		Clearing / Grubbing Topsoil Salvage from Work A	30 days	Wed 2/9/28	Tue 3/21/28	257SS	261SS+20 days,268,269,278
260		Demolition	5 days	Wed 2/23/28	Tue 2/29/28	257SS+10 days	261
261		Minor Saddle Dams - Foundation Excavation	100 days	Wed 3/8/28	Tue 7/25/28	257SS+20 days,258SS+20	263FF+15 days,264FF+20 days
262		**Minor Saddle Dams - Foundation Preparation and Grouting**	**190 days**	**Wed 3/29/28**	**Tue 12/19/28**		
263		Foundation Cleaning	100 days	Wed 3/29/28	Tue 8/15/28	261FF+15 days	264SS+10 days
264		Dental Excavation and Concrete	100 days	Wed 4/12/28	Tue 8/29/28	261FF+20 days,263SS+10	265SS+30 days
265		Grout Cap	80 days	Wed 5/24/28	Tue 9/12/28	264SS+30 days	266SS+10 days
266		Curtain Grouting	140 days	Wed 6/7/28	Tue 12/19/28	265SS+10 days	270SS+60 days
267		**Minor Saddle Dams - Embankment**	**1299 days**	**Wed 3/22/28**	**Mon 3/14/33**		
268		Initial Borrow Development (Core Material)	40 days	Wed 3/22/28	Tue 5/16/28	257,258,259	270SS+20 days
269		Initial Borrow Development for Zones 3 and 4	120 days	Wed 3/22/28	Tue 9/5/28	257,258,259	272,273
270		Place Zone 1 - Core	175 days	Wed 8/30/28	Tue 5/1/29	266SS+60 days,268SS+20	271SS
271		Place Zone 2A & 2B - Filters, Drains and Transitic	175 days	Tue 6/1/32	Mon 1/31/33	270SS,182,186,170	272SS
272		Place Zone 3 - Rockfill	175 days	Tue 6/1/32	Mon 1/31/33	271SS,170,269	273SS
273		Place Zone 4 - Random	175 days	Tue 6/1/32	Mon 1/31/33	272SS,170,269	274FF+10 days
274		Place Rip Rap	145 days	Tue 7/27/32	Mon 2/14/33	273FF+10 days	275FF+20 days
275		Site Reclamation and Topsoil Replacement	60 days	Tue 12/21/32	Mon 3/14/33	274FF+20 days	342
276		**Saddle Dam 8B - Spillway**	**922 days**	**Wed 9/3/25**	**Thu 3/15/29**		
277		Batch Plant Setup and Operational	50 days	Wed 3/22/28	Tue 5/30/28	257,170	281
278		SD 8B - Foundation Excavation	20 days	Wed 3/22/28	Tue 4/18/28	257,258,259,170	279
279		SD 8B - Foundation Cleaning	20 days	Wed 4/19/28	Tue 5/16/28	278	280SS+10 days
280		SD 8B - Dental Excavation and Concrete	20 days	Wed 5/3/28	Tue 5/30/28	279SS+10 days	281
281		SD 8B - Grout Cap	12 days	Wed 5/31/28	Thu 6/15/28	280,277	282
282		SD 8B - Foundation Grouting	45 days	Fri 6/16/28	Thu 8/17/28	281	283
283		SD 8B - Mass Concrete	120 days	Fri 8/18/28	Thu 2/1/29	282	284,285SS+60 days
284		SD 8B - Bridge	30 days	Fri 2/2/29	Thu 3/15/29	283	342
285		SD 8B - Clay Backfill	20 days	Fri 11/10/28	Thu 12/7/28	283SS+60 days	286
286		SD 8B - Riprap and Drain Gravel	3 days	Fri 12/8/28	Tue 12/12/28	285	342
287		Rim Grouting	171 days	Wed 9/3/25	Wed 4/29/26	177	342
288		**Sites Dam Construction**	**585 days**	**Wed 5/19/32**	**Tue 8/15/34**		
289		**Sites Dam Foundation Excavation**	**230 days**	**Wed 5/19/32**	**Tue 4/5/33**		
290		Sites Dam Access and Staging	100 days	Wed 5/19/32	Tue 10/5/32	192,134,175	291SS,293SS+10 days,292SS,311,312,296SS+15 days,298SS+15 days,294SS+20 days
291		Erosion and Sediment Control	100 days	Wed 5/19/32	Tue 10/5/32	290SS	311,294SS+20 days,312
292		Clearing / Grubbing Topsoil Salvage from Work Are	100 days	Wed 5/19/32	Tue 10/5/32	290SS	311,294SS+20 days,312
293		Demolition	50 days	Wed 6/2/32	Tue 8/10/32	290SS+10 days	294SS+20 days
294		Sites Dam - Foundation Excavation	200 days	Wed 6/30/32	Tue 4/5/33	290SS+20 days,291SS+20	305FF+15 days,303SS+30 days,306FF+20 days
295		**Sites Diversion Outlet Facility**	**570 days**	**Wed 6/9/32**	**Tue 8/15/34**		
296		Develop Downstream Portal	90 days	Wed 6/9/32	Tue 10/12/32	290SS+15 days,134	297
297		Tunnel Excavation and Lining - Double Shift	300 days	Wed 10/13/32	Tue 12/6/33	296	300,299,301
298		Develop Upstream Portal	90 days	Wed 6/9/32	Tue 10/12/32	290SS+15 days	300
299		Outlet Structure Concrete	70 days	Wed 12/7/33	Tue 3/14/34	297	302,301
300		Inlet Structure Concrete	70 days	Wed 12/7/33	Tue 3/14/34	297,298	302,301
301		Mechanical	70 days	Wed 3/15/34	Tue 6/20/34	297,299,300	302
302		Sites Diversion Completion and Restoration	20 days	Wed 6/21/34	Tue 7/18/34	299,300,301	303
303		Construct Cofferdam to El. 310	20 days	Wed 7/19/34	Tue 8/15/34	294SS+30 days,302	



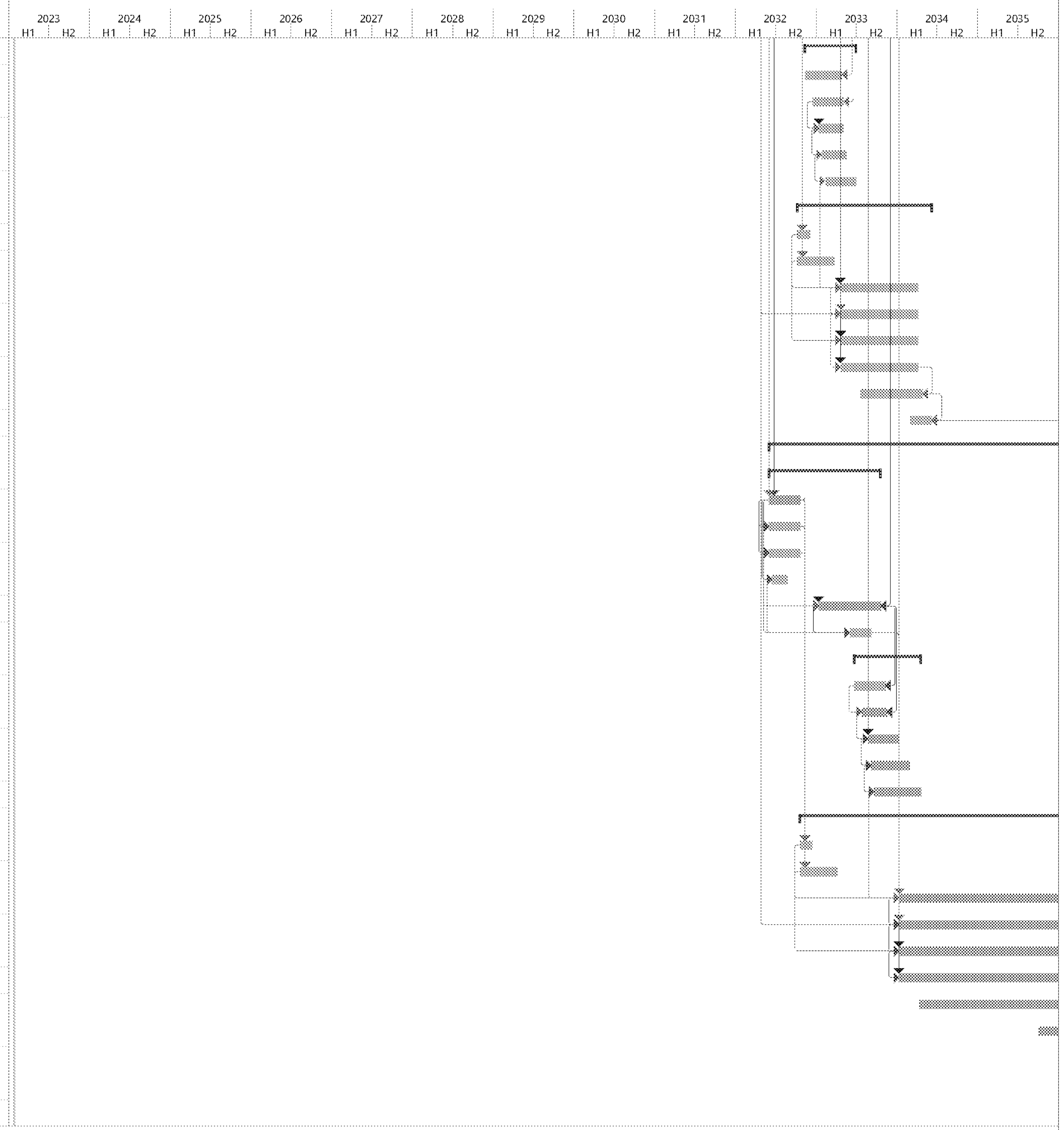
DRAFT Conceptual Construction Schedule Sites Reservoir CP-1.
14-Jan-2023

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

The dates, durations and sequencing shown are based on limited project information.
Additional information aquired, CMAR's approach to the work and other factors will result in a different approach to the work, sequencing, durations and dates.

Rollup - Sites Reservoir, CP-1
DRAFT Conceptual Construction Schedule
HR Facilities - 1.5 MAF
Roadways and Dams
January 2023

ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	Successors
304		**Sites Dam - Foundation Preparation and Grouting**	**165 days**	**Wed 11/10/32**	**Tue 6/28/33**		
305		Foundation Cleaning	120 days	Wed 11/10/32	Tue 4/26/33	294FF+15 days	
306		Dental Excavation and Concrete	100 days	Wed 12/15/32	Tue 5/3/33	294FF+20 days	307SS+20 days
307		Grout Cap	80 days	Wed 1/12/33	Tue 5/3/33	306SS+20 days,146	308SS+10 days
308		Consolidation Grouting	80 days	Wed 1/26/33	Tue 5/17/33	307SS+10 days	309SS+10 days
309		Curtain Grouting	100 days	Wed 2/9/33	Tue 6/28/33	308SS+10 days	313SS+50 days
310		**Sites Dam - Embankment**	**435 days**	**Wed 10/6/32**	**Tue 6/6/34**		
311		Initial Borrow Development (Core Material)	40 days	Wed 10/6/32	Tue 11/30/32	290,291,292	313SS+20 days
312		Initial Quarry Development for Zones 3 and 4	120 days	Wed 10/6/32	Tue 3/22/33	290,291,292	315SS+40 days
313		Place Zone 1 - Core	250 days	Wed 4/20/33	Tue 4/4/34	311SS+20 days,309SS+50	314SS
314		Place Zone 2A & 2B - Filters, Drains and Transitions	250 days	Wed 4/20/33	Tue 4/4/34	313SS,192,158,211SS+30	315SS
315		Place Zone 3 - Rockfill (Some Dbl Shift)	250 days	Wed 4/20/33	Tue 4/4/34	314SS,312SS+40 days,15	316SS
316		Place Zone 4 - Random (Some Dbl Shift)	250 days	Wed 4/20/33	Tue 4/4/34	315SS,158	317FF+15 days
317		Place Rip Rap	200 days	Wed 7/20/33	Tue 4/25/34	316FF+15 days	318FF+30 days
318		Site Reclamation and Topsoil Replacement	70 days	Wed 3/1/34	Tue 6/6/34	317FF+30 days	342
319		**Golden Gate Dam Construction**	**990 days**	**Tue 6/1/32**	**Mon 3/17/36**		
320		**GG Dam Foundation Excavation**	**360 days**	**Tue 6/1/32**	**Mon 10/17/33**		
321		Golden Gate Access and Staging	100 days	Tue 6/1/32	Mon 10/18/32	175,98,57,66,68,71,44,1	322SS,324SS+10 days,323SS,334,335,326SS+100 days,325SS+20 days,79
322		Erosion and Sediment Control	100 days	Tue 6/1/32	Mon 10/18/32	321SS	326SS+100 days,325SS+20 days,334,335
323		Clearing / Grubbing Topsoil Salvage from Work Are	100 days	Tue 6/1/32	Mon 10/18/32	321SS	326SS+100 days,325SS+20 days,334,335
324		Demolition	50 days	Tue 6/15/32	Mon 8/23/32	321SS+10 days	326SS+100 days,325SS+20 days
325		GG Dam - Foundation Excavation (Some Dbl Shift)	200 days	Tue 1/11/33	Mon 10/17/33	321SS+20 days,322SS+20	328FF+15 days,329FF+20 days,326SS+100 days
326		GG Dam - Bypass Pipeline and U/S Cofferdam	70 days	Tue 5/31/33	Mon 9/5/33	321SS+100 days,322SS+1	336
327		**GG Dam - Foundation Preparation and Grouting**	**215 days**	**Tue 6/21/33**	**Mon 4/17/34**		
328		Foundation Cleaning	100 days	Tue 6/21/33	Mon 11/7/33	325FF+15 days	329SS+10 days
329		Dental Excavation and Concrete	80 days	Tue 7/26/33	Mon 11/14/33	325FF+20 days,328SS+10	330SS+20 days
330		Grout Cap	100 days	Tue 8/23/33	Mon 1/9/34	329SS+20 days,109	331SS+10 days
331		Consolidation Grouting	125 days	Tue 9/6/33	Mon 2/27/34	330SS+10 days	332SS+10 days
332		Curtain Grouting	150 days	Tue 9/20/33	Mon 4/17/34	331SS+10 days	336SS+80 days
333		**GG Dam - Embankment**	**890 days**	**Tue 10/19/32**	**Mon 3/17/36**		
334		Initial Borrow Development (Core Material)	40 days	Tue 10/19/32	Mon 12/13/32	321,322,323	336SS+20 days
335		Initial Borrow Development for Zones 3 and 4	120 days	Tue 10/19/32	Mon 4/4/33	321,322,323	338SS+40 days
336		Place Zone 1 - Core	525 days	Tue 1/10/34	Mon 1/14/36	334SS+20 days,332SS+80	337SS
337		Place Zone 2A & 2B - Filters, Drains and Transitions	525 days	Tue 1/10/34	Mon 1/14/36	336SS,192,182,121,211S	338SS
338		Place Zone 3 - Rockfill (Some Dbl Shift)	525 days	Tue 1/10/34	Mon 1/14/36	337SS,335SS+40 days,12	339SS
339		Place Zone 4 - Random (Some Dbl Shift)	525 days	Tue 1/10/34	Mon 1/14/36	338SS,121	340FF+15 days
340		Place Rip Rap	475 days	Tue 4/11/34	Mon 2/4/36	339FF+15 days	341FF+30 days
341		Site Reclamation and Topsoil Replacement	120 days	Tue 10/2/35	Mon 3/17/36	340FF+30 days	342
342		Dams Ready for Commissioning	0 days	Mon 3/17/36	Mon 3/17/36	287,207,202,318,341,28	343
343		Dams Startup and Commissioning	90 days	Tue 3/18/36	Mon 7/21/36	342	344
344		Substantial Completion	0 days	Mon 7/21/36	Mon 7/21/36	343	



DRAFT Conceptual Construction Schedule Sites Reservoir CP-1.
14-Jan-2023

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

The dates, durations and sequencing shown are based on limited project information.
Additional information aquired, CMAR's approach to the work and other factors will result in a different approach to the work, sequencing, durations and dates.

File Provided Natively

Legislative & Outreach Committee

February 2023

Sites

Agenda Item 1.3:
Discussion on 2023 Communications Program Objectives

Kevin Spesert

Sites

Communications Program Strategy

- Strategic, focused, and flexible communications and community outreach approach
- Concentrated on public education and public engagement
- Approach aligns with project activities and milestones
- Utilizing project participants and 3rd party voices to amplify messaging
- Robust media/social media presence and use of new communications technology and approaches
- Proactive local community outreach

Audiences

- Local Landowners/Local Community Members
- Participating Agencies (Internal & External)
- Regulatory/Permitting Agencies (Federal and State)
- Elected Officials (Federal, State, Local)
- Newsom Administration
- Media (Local, Regional, Statewide, National)
- Regional/Statewide Stakeholder Organizations
  - Local Municipalities
  - Business Groups
  - Environmental/Conservation Associations
  - Agricultural Associations
  - Local Government Associations
  - Building Trades
  - Industry/Trade Groups

Communications Objectives for 2023

- Provide communications and community outreach support for the Final EIR/EIS, Water Right, and ongoing permitting process.
- Increase engagement with the local community to address community concerns and identify areas of shared interest.
- Continue to educate key audiences about the Sites Reservoir Project and its significant statewide benefits.
- Continue to develop an informed and engaged coalition of project supporters.
- Provide communication and stakeholder engagement support for project participant’s internal and external audiences.

Final EIR/EIS and Water Right Considerations

- Major project milestones that will increase public interest/attention on the project
- Both will present both communication opportunities and challenges
- Proactive communication effort to highlight key messages around project need, statewide benefits, and how the project will operate
- Explain data and analysis that drove decision making in a clear and transparent manner
- Communicate project facts and counter disinformation
- Strategic and focused stakeholder and public engagement

Communications 2023 Work Plan

- The approved 2023 Communications budget is $551,800
- Some key priorities that were established during the work planning process include:
  - Updating message platform, project materials and FAQ with 2023 messaging and priorities
  - Providing communications support to the Environmental Planning Team for the roll-out of Final EIR/EIS
  - Series of Landowner Meetings (Colusa/Glenn and Yolo)
  - Continue with the Local Community Working Group and establish the Local Tribal Government Working Group
  - Develop video series on key 2023 messages

Additional Activities for Consideration

- Statewide "State of the Project" virtual open house(s) focused on the Final EIR/EIS and upcoming Water Right Process (e.g. summer 2021)
- Strategic and focused coalition development effort to engage supporters and 3rd party voices ahead of EIR/EIS Certification and Water Rights process
- Project update presentations for interested participating agencies following certification of Final EIR/EIS (internal/external audiences)
- Virtual Project Tour video series that highlights project facilities, operations, and benefits

Questions?

Sites

Cost Estimates

- Virtual Open House $15,000
  - Presentation/program development, event promotion (including some paid marketing), facilitation and follow up
- Coalition Development $35,000
  - Direct stakeholder outreach to secure support, mobilizing stakeholders in advance of Final EIR/EIS to amplify Sites messaging and support
- Project Update Presentation $10,000
  - Development of presentation and relevant materials, customized by region as needed.
- Virtual Tour $25,000
  - Storyboarding, script development, filming and production

From: Alicia Forsythe [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=A6CDF06A7E904B65BAA21702A82AD329-AFORSYTHE]
Sent: 1/30/2023 4:41:31 PM
To: Jacobson, Allison M [ajacobson@usbr.gov]; Brick, David A [dbrick@usbr.gov]; Laurie Warner Herson [laurie.warner.herson@phenixenv.com]
Subject: RE: Sites Project - Admin Final EIR/EIS Briefings
Attachments: 202301_Admin Final EIR_EIS Review Prep_Final_V2.pdf; 202301_Admin Final EIR_EIS Review Prep_Final_V2.pptx

Hi all – I changed OneDrive to SharePoint in the presentation. Attached are the updated files.

Allison and David – Do you want to get this out to the Reclamation team? I am so backed up in emails, you may have already sent it out. But just let me know if you want me to send this to those on the meeting invite. Happy to do so.

Ali

Alicia Forsythe | Environmental Planning and Permitting Manager | Sites Project Authority | 916.880.0676 | aforsythe@sitesproject.org | www.SitesProject.org

From: Alicia Forsythe
Sent: Monday, January 30, 2023 8:42 AM
To: 'Jacobson, Allison M' <ajacobson@usbr.gov>; 'Brick, David A' <dbrick@usbr.gov>; 'Laurie Warner Herson' <laurie.warner.herson@phenixenv.com>
Subject: RE: Sites Project - Admin Final EIR/EIS Briefings

Hi all – Attached is the final presentation for our meetings today and tomorrow. I've incorporated changes based on David's comments.

Let me know if you see anything more that needs to be changed. Otherwise, we'll just roll with it.

I did make a PDF file already (attached). I was going to wait to send it out until after the presentation. Figured we might make some tweaks to the presentation if we get comments/questions that indicate some things are unclear.

Ali

Alicia Forsythe | Environmental Planning and Permitting Manager | Sites Project Authority | 916.880.0676 | aforsythe@sitesproject.org | www.SitesProject.org

From: Alicia Forsythe
Sent: Wednesday, January 25, 2023 1:53 PM
To: Jacobson, Allison M <ajacobson@usbr.gov>; Brick, David A <dbrick@usbr.gov>
Cc: Laurie Warner Herson <laurie.warner.herson@phenixenv.com>
Subject: Sites Project - Admin Final EIR/EIS Briefings

Hi Allison and David – It looks like the 2 best days for the Cooperating and Responsible Agency briefings are as follows:

Monday, January 30 from 1 to 2 PM
Wednesday, February 1 from either 2 to 3 pm or 3 to 4 pm (my preference would be 3 to 4 pm)

David, do these days/times work for you?

Allison, I think you may have a conflict with the January 30 one. Are you okay with us moving forward if David can attend?

Ali

Alicia Forsythe | Environmental Planning and Permitting Manager | Sites Project Authority | 916.880.0676 | aforsythe@sitesproject.org | www.SitesProject.org

Sites Reservoir Project
Administrative Final EIR/EIS

January 2023

Sites

1

Agenda

- Purpose of Meeting
  - Provide overview of the Administrative Final EIR/EIS and the review process and schedule
- Approach to the Final EIR/EIS:
  - Final EIR/EIS Development
  - Content and Format
  - Approach to Responses to Comments
- Project Refinements:
  - Preferred Alternative
  - Comparison of RDEIR/SDEIS and Final EIR/EIS Operational Criteria
  - Mitigation Measure Fish-2.1
  - Updated Modeling
  - Facility Refinements
- Review Process and Schedule

2

Approach to Final EIR/EIS

Sites

3

Final EIR/EIS Development

- RDEIR/SDEIS released November 12, 2021
- Close of public review January 28, 2022
  - 101 comment letters
  - Some comments submitted in form letters and in a petition
  - Approximately 1,000 individual comments
- Efforts since RDEIR/SDEIS:
  - Identification of refinements to the Project, both facilities and operations
  - Revisions to diversion criteria and associated modeling
  - Developed master and individual responses to comments
  - Revisions to EIR/EIS text based on comment/responses and/or based on project modifications (e.g., facility changes, operation modifications)

4

Final EIR/EIS Format

- Volume 1 – Chapters
  - Include all chapters from RDEIR/SDEIS *with changes*
- Volume 2 – Appendices
  - Include all appendices from RDEIR/SDEIS *with changes*
- Chapters and appendices without changes are not included
- Changes shown as
  - Admin Final – Changes shown in track changes
  - Final EIR/EIS – Changes shown as margin line only

5

Final EIR/EIS Format (continued)

- Volume 3 – Response to Comments
  - Chapter 1 – Introduction and Approach
  - Chapter 2 – Commenter Indices and Form Letter Introduction
  - Chapter 3 – Master Responses Introduction and Master Responses
  - Chapter 4 – Responses to Comments Tables
  - Appendix – Response to 2017 Comments required by NEPA

6

General Approach To Responding to Comments

- Master Responses
  - Identified common themes and comments in order to draft Master Responses
- Individual Responses
  - Prepared responses to all individual comments
  - Currently organized by topics in comment response tables
  - Individual comments and responses will be reorganized **by letter** prior to publication of the Final EIR/EIS

7

Master Response Topics

- MR1, CEQA and NEPA Process, Regulatory Requirements, and General Comments
- MR2, Alternatives Description and Baseline
- MR3, Hydrology and Hydrologic Modeling
- MR4, Water Quality
- MR5, Aquatic Biological Resources
- MR6, Vegetation, Wetland, and Wildlife Resources
- MR7, Tribal Coordination, Consultation, and Engagement
- MR8, Trinity River
- MR9, Alternatives Development

8

Chapters/Appendices with No Changes

- Chapters
  - 13, Minerals
  - 18, Navigation, Transportation and Traffic
  - 19, Noise
  - 20, Air Quality
  - 22, Cultural Resources
  - 24, Visual Resources
  - 25, Population and Housing
- Appendix 8B, 9A, 9B, 10A, 10B, 19A, 20A, 20C, 20C1, 20C2, 20C3, 20D, 22A, 24A, 24B, 33C

9

Project Refinements

Sites

10

Key Differences

- Changes between RDEIR/SDEIS and Final EIR/EIS:
  - Preferred Alternative is now Alternative 3
  - Revisions to diversion criteria
  - Incorporation of Mitigation Measure Fish-2.1 into Project
  - Revised modeling
  - Minor changes in facilities due to design refinements
  - Corrections or clarifications needed in response to comments
- No new or substantial greater impacts identified that would require recirculation

11

Changed to Alt 3 as Preferred Alternative

Facilities / Operations	Alternative 1 – Authority's Preferred Project in RDEIR/SDEIS	Alternative 2	Alternative 3 – Preferred Alt in the Final EIR/EIS
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 1
Reclamation Involvement	1. Funding Partner, up to 7% 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
DWR Involvement	Operational Exchanges with Oroville and storage in SWP facilities South-of-Delta	Same as Alt 1	Same as Alt 1
Route to West Side of Reservoir	Bridge across reservoir	Paved road around southern end of reservoir	Same as Alt 1

12

Revised Diversion Criteria

Location (Listed from North to South)	RDEIR/SDEIS with Mitigation Included	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 are 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, (2) hourly gage monitoring at Bend Bridge gage detects the predicted flow of 8,000 cfs, and migrating anadromous fish are detected at RBDD, and (3) pulse protection may cease earlier than 7 days if flows at Bend Bridge exceed 25,000 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

13

Revised Diversion Criteria (Continued)

Location (Listed from North to South)	RDEIR/SDEIS with Mitigation Included	Final EIR/EIS
Minimum Bypass Flows in the Sacramento River at Wilkins Slough	Chapter 2: In addition to the minimum bypass flows in the Sacramento River at RBPP and the Hamilton City Pump Station, a minimum bypass flow of 8,000 cfs in the Sacramento River at Wilkins Slough would be in place in April and May and 5,000 cfs during the rest of the year Mitigation Measure FISH-2.1: 10,700 cfs in March through May; 5,000 cfs all other times	10,700 cfs October 1 through June 14; 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 is 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

14

Revised Diversion Criteria (Continued)

Location (Listed from North to South)	RDEIR/SDEIS with Mitigation Included	Final EIR/EIS
Sacramento River Fully Appropriated Stream	Diversions allowed only when the Sacramento River is not fully appropriated (September 1 through June 14)	No change
Excess conditions, as determined by DWR and Reclamation and defined in 2018 COA Addendum	Delta must be in excess for Sites Reservoir diversions	No change
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

15

Incorporation of Mitigation Measure Fish-2.1 into Project

- RDEIR/SDEIS
  - Included Mitigation Measure FISH-2.1 to reduce potential life stage effects on salmonids by increasing the bypass flow requirement at Wilkins Slough
    - Minimum bypass flow requirement of 10,700 cfs at Wilkins Slough in March-May
- Final EIR/EIS
  - Project description now incorporates the requirements of Mitigation Measure FISH-2.1, which have been refined and made more restrictive (the revised diversion criteria on the previous slide)
  - The bypass flow requirement at Wilkins Slough has been developed as an integral component of how the Project is proposed to operate in terms of its water diversion criteria
  - The modeling performed for the Final EIR/EIS includes the revised diversion criteria
  - This eliminates the need for Mitigation Measure FISH-2.1 in the Final EIR/EIS

16

Revised Modeling

- Adjustments made in the CALSIM II modeling between the RDEIR/SDEIS and the Final EIR/EIS to better represent the most up-to-date modeling procedures and actual operations, including:
  - Shasta Lake Operations – expanded exchanges to include more opportunities for fall flow stability and spring pulse enhancement
  - Deadpool Volume – reduced from generally 120 TAF to 60 TAF
  - Delta Salinity Accounting – slightly refined based on revisions to Calsim II coding
  - Period of Diversion to Sites Storage – revised to only include Sept 1 to June 14 to match water right application
  - South of Delta Water Delivery – revised to allow in any year that capacity is available (previously limited to below normal, dry and critically dry years)
  - Updates to Diversion Criteria – revised diversion criteria incorporated

17

Facility Refinements

- The RDEIR/SDEIS noted that:
  - "Preliminary design for facilities described herein will continue to be refined and modifications may occur as needed as the Project proceeds to final design and as part of the ongoing value engineering process undertaken by the Authority."
- Admin Final EIR/EIS includes:
  - Sloped rather than vertical Inlet/Outlet (I/O) Tower
  - Single 32' diameter I/O tunnel replaces two 23' tunnels
  - Removal of two emergency release structures, eliminating emergency drawdown releases to Hunters Creek

18

Review Process and Schedule

Sites

19

Review Process and Schedule

- Starting February 1 files will be available for online review
  - Email will be sent with link to everyone invited to these meetings
- Additional files added as they are ready with all files posted by February 10
  - Additional emails sent as new files are uploaded
- Final editing and formatting not finished – its good but still working on great!
  - Focus comments on substantive issues
  - We appreciate pointing out number inconsistencies
  - Don't bother to comment on edits and format
- All comments due by February 28

20

Format for Comments

- Please provide comments in comment bubbles
- Prefer no track change edits but recommended text changes can be added in bubbles
- Prefer comments all on SharePoint so everyone can see each others comments
- If you copy/download a file for your internal agency review, please upload back onto SharePoint with your agency name on the end
  - 01_ExecutiveSummary_Sites
- Each person accessing SharePoint needs “individual” access

21

Where To Go With Questions

- File access issues/challenges
  - Laurie Warner Herson at laurie.warner.herson@phenixenv.com
- CEQA Responsible Agencies
  - Ali Forsythe at aforsythe@sitesproject.org
  - Laurie Warner Herson
- Reclamation staff and NEPA Cooperating Agencies
  - David Brick at dbrick@usbr.gov
  - Allison Jacobson at ajacobson@usbr.gov

22

Questions?

Sites

23

Sites

24

Sites Reservoir Project

Administrative Final EIR/EIS

January 2023

Sites

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Speaker: Ali

Approach to Final EIR/EIS

Sites

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Speaker: Laurie/ICF?

Draft - Predecisional Working Document - For Discussion Purposes Only

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Speaker: Laurie/ICF?

Final EIR/EIS Format (continued)

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  - Chapter 2 – Commenter Indices and Form Letter Introduction
  - Chapter 3 – Master Responses Introduction and Master Responses
  - Chapter 4 – Responses to Comments Tables
  - Appendix – Response to 2017 Comments required by NEPA

Speaker: Laurie/ICF?

General Approach To Responding to Comments

- Master Responses
  - Identified common themes and comments in order to draft Master Responses
- Individual Responses
  - Prepared responses to all individual comments
  - Currently organized by topics in comment response tables
  - Individual comments and responses will be reorganized **by letter** prior to publication of the Final EIR/EIS

Speaker: Laurie/ICF?

Potential Speaking Notes in case people are interested in Master Responses

Master responses will ultimately be informed by comments in comment response tables and revised hydrologic modeling results
Preliminary Master Responses Currently Include:
Responses to General Comments: May have separate public outreach and Tribal engagement, coordination, consultation master response
Alternatives Description and Baseline
Hydrology & Hydrologic Modeling
Water Quality
Aquatic Biological Resources
Trinity River
Alternatives Screening and Selection
Other Analyses and/or Other Modeling (e.g., climate change)

Master Response Topics

- MR1, CEQA and NEPA Process, Regulatory Requirements, and General Comments
- MR2, Alternatives Description and Baseline
- MR3, Hydrology and Hydrologic Modeling
- MR4, Water Quality
- MR5, Aquatic Biological Resources
- MR6, Vegetation, Wetland, and Wildlife Resources
- MR7, Tribal Coordination, Consultation, and Engagement
- MR8, Trinity River
- MR9, Alternatives Development

Speaker: Laurie/ICF?

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Alternatives Screening and Selection
Other Analyses and/or Other Modeling (e.g., climate change)

Chapters/Appendices with No Changes

- Chapters
  - 13, Minerals
  - 18, Navigation, Transportation and Traffic
  - 19, Noise
  - 20, Air Quality
  - 22, Cultural Resources
  - 24, Visual Resources
  - 25, Population and Housing
- Appendix 8B, 9A, 9B, 10A, 10B, 19A, 20A, 20C, 20C1, 20C2, 20C3, 20D, 22A, 24A, 24B, 33C

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Project Refinements

Sites

Key Differences

- Changes between RDEIR/SDEIS and Final EIR/EIS:
  - Preferred Alternative is now Alternative 3
  - Revisions to diversion criteria
  - Incorporation of Mitigation Measure Fish-2.1 into Project
  - Revised modeling
  - Minor changes in facilities due to design refinements
  - Corrections or clarifications needed in response to comments
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Speaker: Ali

Draft - Predecisional Working Document - For Discussion Purposes Only

Changed to Alt 3 as Preferred Alternative

Facilities / Operations	Alternative 1 – Authority's Preferred Project in RDEIR/SDEIS	Alternative 2	Alternative 3 – Preferred Alt in the Final EIR/EIS
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 1
Reclamation Involvement	1. Funding Partner, up to 7% 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
DWR Involvement	Operational Exchanges with Oroville and storage in SWP facilities South-of-Delta	Same as Alt 1	Same as Alt 1
Route to West Side of Reservoir	Bridge across reservoir	Paved road around southern end of reservoir	Same as Alt 1

Revised Diversion Criteria

Location (Listed from North to South)	RDEIR/SDEIS with Mitigation Included	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 are 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, (2) hourly gage monitoring at Bend Bridge gage detects the predicted flow of 8,000 cfs, and migrating anadromous fish are detected at RBDD, and (3) 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

Revised Diversion Criteria (Continued)

Location (Listed from North to South)	RDEIR/SDEIS with Mitigation Included	Final EIR/EIS
Minimum Bypass Flows in the Sacramento River at Wilkins Slough	Chapter 2: in addition to the minimum bypass flows in the Sacramento River at RBPP and the Hamilton City Pump Station, a minimum bypass flow of 8,000 cfs in the Sacramento River at Wilkins Slough would be in place in April and May and 5,000 cfs during the rest of the year Mitigation Measure FISH-2.1: 10,700 cfs in March through May; 5,000 cfs all other times	10,700 cfs October 1 through June 14; 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 is 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

Revised Diversion Criteria (Continued)

Location (Listed from North to South)	RDEIR/SDEIS with Mitigation Included	Final EIR/EIS
Sacramento River Fully Appropriated Stream	Diversions allowed only when the Sacramento River is not fully appropriated (September 1 through June 14)	No change
Excess conditions, as determined by DWR and Reclamation and defined in 2018 COA Addendum	Delta must be in excess for Sites Reservoir diversions	No change
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

Incorporation of Mitigation Measure Fish-2.1 into Project

- RDEIR/SDEIS
  - Included Mitigation Measure FISH-2.1 to reduce potential life stage effects on salmonids by increasing the bypass flow requirement at Wilkins Slough
    - Minimum bypass flow requirement of 10,700 cfs at Wilkins Slough in March-May
- Final EIR/EIS
  - Project description now incorporates the requirements of Mitigation Measure FISH-2.1, which have been refined and made more restrictive (the revised diversion criteria on the previous slide)
  - The bypass flow requirement at Wilkins Slough has been developed as an integral component of how the Project is proposed to operate in terms of its water diversion criteria
  - The modeling performed for the Final EIR/EIS includes the revised diversion criteria
  - This eliminates the need for Mitigation Measure FISH-2.1 in the Final EIR/EIS

Revised Modeling

- Adjustments made in the CALSIM II modeling between the RDEIR/SDEIS and the Final EIR/EIS to better represent the most up-to-date modeling procedures and actual operations, including:
  - Shasta Lake Operations – expanded exchanges to include more opportunities for fall flow stability and spring pulse enhancement
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  - Delta Salinity Accounting – slightly refined based on revisions to Calsim II coding
  - Period of Diversion to Sites Storage – revised to only include Sept 1 to June 14 to match water right application
  - South of Delta Water Delivery – revised to allow in any year that capacity is available (previously limited to below normal, dry and critically dry years)
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Facility Refinements

- The RDEIR/SDEIS noted that:
  - "Preliminary design for facilities described herein will continue to be refined and modifications may occur as needed as the Project proceeds to final design and as part of the ongoing value engineering process undertaken by the Authority."
- Admin Final EIR/EIS includes:
  - Sloped rather than vertical Inlet/Outlet (I/O) Tower
  - Single 32' diameter I/O tunnel replaces two 23' tunnels
  - Removal of two emergency release structures, eliminating emergency drawdown releases to Hunters Creek

Review Process and Schedule

Sites

Review Process and Schedule

- Starting February 1 files will be available for online review
  - Email will be sent with link to everyone invited to these meetings
- Additional files added as they are ready with all files posted by February 10
  - Additional emails sent as new files are uploaded
- Final editing and formatting not finished – its good but still working on great!
  - Focus comments on substantive issues
  - We appreciate pointing out number inconsistencies
  - Don't bother to comment on edits and format
- All comments due by February 28

Speaker: Ali

Format for Comments

- Please provide comments in comment bubbles
- Prefer no track change edits but recommended text changes can be added in bubbles
- Prefer comments all on SharePoint so everyone can see each others comments
- If you copy/download a file for your internal agency review, please upload back onto SharePoint with your agency name on the end
  - 01_ExecutiveSummary_Sites
- Each person accessing SharePoint needs "individual" access

Speaker: Ali

Where To Go With Questions

- File access issues/challenges
  - Laurie Warner Herson at laurie.warner.herson@phenixenv.com
- CEQA Responsible Agencies
  - Ali Forsythe at aforsythe@sitesproject.org
  - Laurie Warner Herson
- Reclamation staff and NEPA Cooperating Agencies
  - David Brick at dbrick@usbr.gov
  - Allison Jacobson at ajacobson@usbr.gov

Speaker: Ali

Questions?

Sites

60TAF Operational Dead Pool

- RDEIR/SDEIS assumed operational dead pool at 120TAF
- Revised operational dead pool of 60TAF results in:
  - occasional periods of lower storage and increased evapoconcentration of metals
  - Negligible change in temperature of receiving waters and release of metals to receiving waters
  - When near or at operational dead pool, releases, if needed, into Stone Corral and Funks Creeks:
    - Could have higher concentrations cyanobacteria and cyanotoxins (HABs) than with the 120 TAF dead pool
    - Could have higher metal concentrations than with the 120 TAF dead pool
  - Effects addressed in MR4, Water Quality

Speaker: John, 60 TAF = 323 ft ASL

Draft - Predecisional Working Document - For Discussion Purposes Only

Key Topics in Comments

- Comments address:
  - Trinity River impacts
  - Water rights
  - Level of Tribal consultation
  - Need to disclose operations plan
  - Fisheries impacts
  - Flood impacts
  - Faults and earthquake scenarios
  - Groundwater, seepage
  - Feasibility and project costs
  - Need to better define ecosystem benefits
  - Service needs due to changes to the town of Maxwell

Speaker: Laurie

Public Agency Comments

- Tribal:
  - United Auburn Indian Council
  - Winnemem Wintu Tribe (with NGO group)
  - Yocha Dehe Wintun Nation
- Federal:
  - National Marine Fisheries Service
  - US Environmental Protection Agency
- State:
  - California Department of Fish and Wildlife
  - CA Office of Environmental Health and Hazard Assessment
  - Central Valley Regional Water Quality Control Board
  - State Water Resources Control Board, Water Rights Division
- Regional:
  - Contra Costa Water District
  - East Bay Municipal Utility District
  - Local Agencies of the North Delta
- Local:
  - Colusa County Board of Supervisors
  - Maxwell Fire Protection District
  - Maxwell Public Utility District
  - Maxwell Unified School District
- Water NGOs:
  - State Water Contractors
  - Northern California Water Association

Speaker: Laurie

Non-Governmental Organizations Comments

- AquAlliance
- Bay Institute
- California Indian Environmental Alliance
- California Sportfishing Protection Alliance
- CalWild
- Center for Biological Diversity
- Defenders of Wildlife
- Friends of the River
- Golden State Salmon Association
- Golden West Women Flyfishers
- Institute for Fisheries Resources
- Natural Resources Defense Council
- Northern California Council Fly Fishers International
- North Coast Rivers Alliance
- Planning and Conservation League
- Pacific Coast Federation of Fishermen's Associations
- Restore the Delta
- San Francisco Baykeeper
- Save California Salmon
- Sierra Club California

Speaker: Laurie

From: Alicia Forsythe [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=A6CDF06A7E904B65BAA21702A82AD329-AFORSYTHE]
Sent: 1/30/2023 4:45:12 PM
To: Amy.Young@water.ca.gov; Montgomery, Amanda@Waterboards [Amanda.Montgomery@waterboards.ca.gov]; 'Kristal Davis Fadtke (Kristal.Davis-Fadtke@wildlife.ca.gov)' [Kristal.Davis-Fadtke@wildlife.ca.gov]; Okita, David@DWR [David.Okita@water.ca.gov]; 'Cooke, Robert@DWR' [Robert.Cooke@water.ca.gov]; Biondi, Oscar@Waterboards [Oscar.Biondi@waterboards.ca.gov]; Heinrich, Dana@Waterboards [Dana.Heinrich@waterboards.ca.gov]; 'Tores, Juan Lopez' [Juan.Torres@wildlife.ca.gov]; 'Ore, AnnMarie@Waterboards' [annmarie.ore@waterboards.ca.gov]; Jagruti.Maroney@water.ca.gov; Uttley, Paige@Wildlife [Paige.Uttley@wildlife.ca.gov]; Williams, Jonathan@Wildlife [Jonathan.Williams@wildlife.ca.gov]; Hartman, Jelena@Waterboards [Jelena.Hartman@waterboards.ca.gov]; dylan.wood@wildlife.ca.gov; 'Laurie Warner Herson' [laurie.warner.herson@phenixenv.com]; Spranza, John [John.Spranza@hdrinc.com]; 'Jelica Arsenijevic' [Jelica.Arsenijevic@hdrinc.com]; Jacobson, Allison M [ajacobson@usbr.gov]; Brick, David A [dbrick@usbr.gov]; Sheya, Tanya@Wildlife [Tanya.Sheya@wildlife.ca.gov]; Sandino, David@DWR [David.Sandino@water.ca.gov]; Riddle, Diane@Waterboards [Diane.Riddle@waterboards.ca.gov]; Leahigh, John@DWR [John.Leahigh@water.ca.gov]; Roberts, Matthew J CIV USARMY CESPK (USA) [Matthew.J.Roberts@usace.army.mil]; Haley, Nancy A CIV USARMY CESPK (USA) [Nancy.A.Haley@usace.army.mil]; Kelly, Elizabeth [EKelly@WAPA.GOV]; Stephen Maurano [stephen.maurano@noaa.gov]; evan.sawyer [evan.sawyer@noaa.gov]; elif.wilkins@noaa.gov; Schoenberg, Steven [steven_schoenberg@fws.gov]; Gordon, Stephanie (Skophammer) [GORDON.STEPHANIES@EPA.GOV]; Morgan, Joseph [Morgan.Joseph@epa.gov]; derek.wadsworth@waterboards.ca.gov; daniel.odonnell@wildlife.ca.gov; Hennessy, April@Wildlife [April.Hennessy@wildlife.ca.gov]; michael.paccassi@wildlife.ca.gov; christina.lupoli@wildlife.ca.gov
CC: Miller, Jeffrey [JAMiller@WAPA.GOV]; amanda.cranford@noaa.gov; Bolden, Amy [Bolden@WAPA.GOV]; Saare, LaTisha [Saare@WAPA.GOV]; Mitchell, Allison B [allison.mitchell@sol.doi.gov]
Subject: RE: Sites Reservoir Project - Admin Final EIR/EIS Review Briefing
Attachments: 202301_Admin Final EIR_EIS Review Prep_Final_V2.pdf

Hello all! Thanks for joining us this afternoon for the Admin Final EIR/EIS review briefing. Attached is the presentation.

Reminder that this will be the same presentation that we will provide Wednesday, Feb 1 at 3 PM. You don't need to attend both meetings at the materials will be repetitive.

Please don't hesitate to reach out with questions or concerns.

Ali

Alicia Forsythe | Environmental Planning and Permitting Manager | Sites Project Authority | 916.880.0676 | aforsythe@sitesproject.org | www.SitesProject.org

-----Original Appointment-----
From: Alicia Forsythe
Sent: Wednesday, January 25, 2023 1:37 PM
To: Alicia Forsythe; Amy.Young@water.ca.gov; Montgomery, Amanda@Waterboards; Kristal Davis Fadtke (Kristal.Davis-Fadtke@wildlife.ca.gov); Okita, David@DWR; Cooke, Robert@DWR; Biondi, Oscar@Waterboards; Heinrich, Dana@Waterboards; 'Tores, Juan Lopez'; 'Ore, AnnMarie@Waterboards'; Jagruti.Maroney@water.ca.gov; Uttley,

Paige@Wildlife; Williams, Jonathan@Wildlife; Hartman, Jelena@Waterboards; dylan.wood@wildlife.ca.gov; Laurie Warner Herson; Spranza, John; 'Jelica Arsenijevic'; Jacobson, Allison M; Brick, David A; Sheya, Tanya@Wildlife; Sandino, David@DWR; Riddle, Diane@Waterboards; Leahigh, John@DWR; Roberts, Matthew J CIV USARMY CESPK (USA); Haley, Nancy A CIV USARMY CESPK (USA); Kelly, Elizabeth; Stephen Maurano; evan.sawyer; elif.wilkins@noaa.gov; Schoenberg, Steven; Gordon, Stephanie (Skophammer); Morgan, Joseph; derek.wadsworth@waterboards.ca.gov; daniel.odonnell@wildlife.ca.gov; Hennessy, April@Wildlife; michael.paccassi@wildlife.ca.gov; christina.lupoli@wildlife.ca.gov
Cc: Miller, Jeffrey; amanda.cranford@noaa.gov; Bolden, Amy; Saare, LaTisha; Mitchell, Allison B
Subject: Sites Reservoir Project - Admin Final EIR/EIS Review Briefing
When: Monday, January 30, 2023 1:00 PM-2:00 PM (UTC-08:00) Pacific Time (US & Canada).
Where: Microsoft Teams Meeting

Purpose: Overview of the admin Final EIR/EIS in preparation for the NEPA Cooperating Agency and CEQA Responsible Agency review.

Agenda: Purpose of Meeting
Approach to the Final EIR/EIS
Project Refinements
Review Process and Schedule
Any Remaining Questions or Related Topics

This is 1 of 2 meetings on this topic. Both meetings have the same agenda and presentation – and will be repetitive. You do not need to attend both meetings.

I tried to get everyone on Reclamation's and Sites' distribution list along with everyone that responded to the doodle poll. Apologies if I missed anyone. Please forward to those I may have missed or email me and I can forward.

Thanks all!

Microsoft Teams meeting

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Or call in (audio only)
+1 916-538-7066,,909002510# United States, Sacramento
Phone Conference ID: 909 002 510#
Find a local number | Reset PIN

Learn More | Meeting options

Sites Reservoir Project
Administrative Final EIR/EIS

January 2023

Sites

1

Agenda

- Purpose of Meeting
  - Provide overview of the Administrative Final EIR/EIS and the review process and schedule
- Approach to the Final EIR/EIS:
  - Final EIR/EIS Development
  - Content and Format
  - Approach to Responses to Comments
- Project Refinements:
  - Preferred Alternative
  - Comparison of RDEIR/SDEIS and Final EIR/EIS Operational Criteria
  - Mitigation Measure Fish-2.1
  - Updated Modeling
  - Facility Refinements
- Review Process and Schedule

2

Approach to Final EIR/EIS

Sites

3

Final EIR/EIS Development

- RDEIR/SDEIS released November 12, 2021
- Close of public review January 28, 2022
  - 101 comment letters
  - Some comments submitted in form letters and in a petition
  - Approximately 1,000 individual comments
- Efforts since RDEIR/SDEIS:
  - Identification of refinements to the Project, both facilities and operations
  - Revisions to diversion criteria and associated modeling
  - Developed master and individual responses to comments
  - Revisions to EIR/EIS text based on comment/responses and/or based on project modifications (e.g., facility changes, operation modifications)

4

Final EIR/EIS Format

- Volume 1 – Chapters
  - Include all chapters from RDEIR/SDEIS *with changes*
- Volume 2 – Appendices
  - Include all appendices from RDEIR/SDEIS *with changes*
- Chapters and appendices without changes are not included
- Changes shown as
  - Admin Final – Changes shown in track changes
  - Final EIR/EIS – Changes shown as margin line only

5

Final EIR/EIS Format (continued)

- Volume 3 – Response to Comments
  - Chapter 1 – Introduction and Approach
  - Chapter 2 – Commenter Indices and Form Letter Introduction
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Master Response Topics

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14

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15

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16

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18

Review Process and Schedule

Sites

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  - We appreciate pointing out number inconsistencies
  - Don't bother to comment on edits and format
- All comments due by February 28

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Format for Comments

- Please provide comments in comment bubbles
- Prefer no track change edits but recommended text changes can be added in bubbles
- Prefer comments all on SharePoint so everyone can see each others comments
- If you copy/download a file for your internal agency review, please upload back onto SharePoint with your agency name on the end
  - 01_ExecutiveSummary_Sites
- Each person accessing SharePoint needs "individual" access

21

Where To Go With Questions

- File access issues/challenges
  - Laurie Warner Herson at laurie.warner.herson@phenixenv.com
- CEQA Responsible Agencies
  - Ali Forsythe at aforsythe@sitesproject.org
  - Laurie Warner Herson
- Reclamation staff and NEPA Cooperating Agencies
  - David Brick at dbrick@usbr.gov
  - Allison Jacobson at ajacobson@usbr.gov

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Questions?

Sites

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Sites

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From: Alicia Forsythe [aforsythe@sitesproject.org]
Sent: 1/30/2023 4:45:12 PM
To: Amy.Young@water.ca.gov; Montgomery, Amanda@Waterboards [Amanda.Montgomery@waterboards.ca.gov]; 'Kristal Davis Fadtke (Kristal.Davis-Fadtke@wildlife.ca.gov)' [Kristal.Davis-Fadtke@wildlife.ca.gov]; Okita, David@DWR [David.Okita@water.ca.gov]; 'Cooke, Robert@DWR' [Robert.Cooke@water.ca.gov]; Biondi, Oscar@Waterboards [Oscar.Biondi@waterboards.ca.gov]; Heinrich, Dana@Waterboards [Dana.Heinrich@waterboards.ca.gov]; 'Tores, Juan Lopez' [Juan.Torres@wildlife.ca.gov]; 'Ore, AnnMarie@Waterboards' [annmarie.ore@waterboards.ca.gov]; Jagruti.Maroney@water.ca.gov; Uttley, Paige@Wildlife [Paige.Uttley@wildlife.ca.gov]; Williams, Jonathan@Wildlife [Jonathan.Williams@wildlife.ca.gov]; Hartman, Jelena@Waterboards [Jelena.Hartman@waterboards.ca.gov]; dylan.wood@wildlife.ca.gov; 'Laurie Warner Herson' [laurie.warner.herson@phenixenv.com]; Spranza, John [john.spranza@hdrinc.com]; 'Jelica Arsenijevic' [Jelica.Arsenijevic@hdrinc.com]; Jacobson, Allison M [ajacobson@usbr.gov]; Brick, David A [dbrick@usbr.gov]; Sheya, Tanya@Wildlife [Tanya.Sheya@wildlife.ca.gov]; Sandino, David@DWR [David.Sandino@water.ca.gov]; Riddle, Diane@Waterboards [Diane.Riddle@waterboards.ca.gov]; Leahigh, John@DWR [John.Leahigh@water.ca.gov]; Roberts, Matthew J CIV USARMY CESPK (USA) [Matthew.J.Roberts@usace.army.mil]; Haley, Nancy A CIV USARMY CESPK (USA) [Nancy.A.Haley@usace.army.mil]; Kelly, Elizabeth [EKelly@WAPA.GOV]; Stephen Maurano [stephen.maurano@noaa.gov]; evan.sawyer [evan.sawyer@noaa.gov]; elif.wilkins@noaa.gov; Schoenberg, Steven [steven_schoenberg@fws.gov]; Gordon, Stephanie (Skophammer) [GORDON.STEPHANIES@EPA.GOV]; Morgan, Joseph [Morgan.Joseph@epa.gov]; derek.wadsworth@waterboards.ca.gov; daniel.odonnell@wildlife.ca.gov; Hennessy, April@Wildlife [April.Hennessy@wildlife.ca.gov]; michael.paccassi@wildlife.ca.gov; christina.lupoli@wildlife.ca.gov
CC: Miller, Jeffrey [JAMiller@WAPA.GOV]; amanda.cranford@noaa.gov; Bolden, Amy [Bolden@WAPA.GOV]; Saare, LaTisha [Saare@WAPA.GOV]; Mitchell, Allison B [allison.mitchell@sol.doi.gov]
Subject: RE: Sites Reservoir Project - Admin Final EIR/EIS Review Briefing
Attachments: 202301_Admin Final EIR_EIS Review Prep_Final_V2.pdf

EXTERNAL:

Hello all! Thanks for joining us this afternoon for the Admin Final EIR/EIS review briefing. Attached is the presentation.

Reminder that this will be the same presentation that we will provide Wednesday, Feb 1 at 3 PM. You don't need to attend both meetings at the materials will be repetitive.

Please don't hesitate to reach out with questions or concerns.

Ali

Alicia Forsythe | Environmental Planning and Permitting Manager | Sites Project Authority | 916.880.0676 | aforsythe@sitesproject.org | www.SitesProject.org

-----Original Appointment-----
From: Alicia Forsythe
Sent: Wednesday, January 25, 2023 1:37 PM
To: Alicia Forsythe; Amy.Young@water.ca.gov; Montgomery, Amanda@Waterboards; Kristal Davis Fadtke (Kristal.Davis-Fadtke@wildlife.ca.gov); Okita, David@DWR; Cooke, Robert@DWR; Biondi, Oscar@Waterboards; Heinrich,

Dana@Waterboards; 'Tores, Juan Lopez'; 'Ore, AnnMarie@Waterboards'; Jagruti.Maroney@water.ca.gov; Uttley, Paige@Wildlife; Williams, Jonathan@Wildlife; Hartman, Jelena@Waterboards; dylan.wood@wildlife.ca.gov; Laurie Warner Herson; Spranza, John; 'Jelica Arsenijevic'; Jacobson, Allison M; Brick, David A; Sheya, Tanya@Wildlife; Sandino, David@DWR; Riddle, Diane@Waterboards; Leahigh, John@DWR; Roberts, Matthew J CIV USARMY CESPK (USA); Haley, Nancy A CIV USARMY CESPK (USA); Kelly, Elizabeth; Stephen Maurano; evan.sawyer; elif.wilkins@noaa.gov; Schoenberg, Steven; Gordon, Stephanie (Skophammer); Morgan, Joseph; derek.wadsworth@waterboards.ca.gov; daniel.odonnell@wildlife.ca.gov; Hennessy, April@Wildlife; michael.paccassi@wildlife.ca.gov; christina.lupoli@wildlife.ca.gov
Cc: Miller, Jeffrey; amanda.cranford@noaa.gov; Bolden, Amy; Saare, LaTisha; Mitchell, Allison B
Subject: Sites Reservoir Project - Admin Final EIR/EIS Review Briefing
When: Monday, January 30, 2023 1:00 PM-2:00 PM (UTC-08:00) Pacific Time (US & Canada).
Where: Microsoft Teams Meeting

Purpose: Overview of the admin Final EIR/EIS in preparation for the NEPA Cooperating Agency and CEQA Responsible Agency review.

Agenda: Purpose of Meeting
Approach to the Final EIR/EIS
Project Refinements
Review Process and Schedule
Any Remaining Questions or Related Topics

This is 1 of 2 meetings on this topic. Both meetings have the same agenda and presentation – and will be repetitive. You do not need to attend both meetings.

I tried to get everyone on Reclamation's and Sites' distribution list along with everyone that responded to the doodle poll. Apologies if I missed anyone. Please forward to those I may have missed or email me and I can forward.

Thanks all!

Microsoft Teams meeting

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Sites Reservoir Project
Administrative Final EIR/EIS

January 2023

1

Agenda

- Purpose of Meeting
  - Provide overview of the Administrative Final EIR/EIS and the review process and schedule
- Approach to the Final EIR/EIS:
  - Final EIR/EIS Development
  - Content and Format
  - Approach to Responses to Comments
- Project Refinements:
  - Preferred Alternative
  - Comparison of RDEIR/SDEIS and Final EIR/EIS Operational Criteria
  - Mitigation Measure Fish-2.1
  - Updated Modeling
  - Facility Refinements
- Review Process and Schedule

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Approach to Final EIR/EIS

Sites

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Final EIR/EIS Development

- RDEIR/SDEIS released November 12, 2021
- Close of public review January 28, 2022
  - 101 comment letters
  - Some comments submitted in form letters and in a petition
  - Approximately 1,000 individual comments
- Efforts since RDEIR/SDEIS:
  - Identification of refinements to the Project, both facilities and operations
  - Revisions to diversion criteria and associated modeling
  - Developed master and individual responses to comments
  - Revisions to EIR/EIS text based on comment/responses and/or based on project modifications (e.g., facility changes, operation modifications)

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Final EIR/EIS Format

- Volume 1 – Chapters
  - Include all chapters from RDEIR/SDEIS *with changes*
- Volume 2 – Appendices
  - Include all appendices from RDEIR/SDEIS *with changes*
- Chapters and appendices without changes are not included
- Changes shown as
  - Admin Final – Changes shown in track changes
  - Final EIR/EIS – Changes shown as margin line only

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Final EIR/EIS Format (continued)

- Volume 3 – Response to Comments
  - Chapter 1 – Introduction and Approach
  - Chapter 2 – Commenter Indices and Form Letter Introduction
  - Chapter 3 – Master Responses Introduction and Master Responses
  - Chapter 4 – Responses to Comments Tables
  - Appendix – Response to 2017 Comments required by NEPA

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General Approach To Responding to Comments

- Master Responses
  - Identified common themes and comments in order to draft Master Responses
- Individual Responses
  - Prepared responses to all individual comments
  - Currently organized by topics in comment response tables
  - Individual comments and responses will be reorganized **by letter** prior to publication of the Final EIR/EIS

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Master Response Topics

- MR1, CEQA and NEPA Process, Regulatory Requirements, and General Comments
- MR2, Alternatives Description and Baseline
- MR3, Hydrology and Hydrologic Modeling
- MR4, Water Quality
- MR5, Aquatic Biological Resources
- MR6, Vegetation, Wetland, and Wildlife Resources
- MR7, Tribal Coordination, Consultation, and Engagement
- MR8, Trinity River
- MR9, Alternatives Development

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Chapters/Appendices with No Changes

- Chapters
  - 13, Minerals
  - 18, Navigation, Transportation and Traffic
  - 19, Noise
  - 20, Air Quality
  - 22, Cultural Resources
  - 24, Visual Resources
  - 25, Population and Housing
- Appendix 8B, 9A, 9B, 10A, 10B, 19A, 20A, 20C, 20C1, 20C2, 20C3, 20D, 22A, 24A, 24B, 33C

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Project Refinements

Sites

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Key Differences

- Changes between RDEIR/SDEIS and Final EIR/EIS:
  - Preferred Alternative is now Alternative 3
  - Revisions to diversion criteria
  - Incorporation of Mitigation Measure Fish-2.1 into Project
  - Revised modeling
  - Minor changes in facilities due to design refinements
  - Corrections or clarifications needed in response to comments
- No new or substantial greater impacts identified that would require recirculation

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Changed to Alt 3 as Preferred Alternative

Facilities / Operations	Alternative 1 – Authority's Preferred Project in RDEIR/SDEIS	Alternative 2	Alternative 3 – Preferred Alt in the Final EIR/EIS
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 1
Reclamation Involvement	1. Funding Partner, up to 7% 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
DWR Involvement	Operational Exchanges with Oroville and storage in SWP facilities South-of-Delta	Same as Alt 1	Same as Alt 1
Route to West Side of Reservoir	Bridge across reservoir	Paved road around southern end of reservoir	Same as Alt 1

12

Revised Diversion Criteria

Location (Listed from North to South)	RDEIR/SDEIS with Mitigation Included	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 are 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, (2) hourly gage monitoring at Bend Bridge gage detects the predicted flow of 8,000 cfs, and migrating anadromous fish are detected at RBDD, and (3) pulse protection may cease earlier than 7 days if flows at Bend Bridge exceed 25,000 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

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Revised Diversion Criteria (Continued)

Location (Listed from North to South)	RDEIR/SDEIS with Mitigation Included	Final EIR/EIS
Minimum Bypass Flows in the Sacramento River at Wilkins Slough	Chapter 2: In addition to the minimum bypass flows in the Sacramento River at RBPP and the Hamilton City Pump Station, a minimum bypass flow of 8,000 cfs in the Sacramento River at Wilkins Slough would be in place in April and May and 5,000 cfs during the rest of the year Mitigation Measure FISH-2.1: 10,700 cfs in March through May; 5,000 cfs all other times	10,700 cfs October 1 through June 14; 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 is 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

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Revised Diversion Criteria (Continued)

Location (Listed from North to South)	RDEIR/SDEIS with Mitigation Included	Final EIR/EIS
Sacramento River Fully Appropriated Stream	Diversions allowed only when the Sacramento River is not fully appropriated (September 1 through June 14)	No change
Excess conditions, as determined by DWR and Reclamation and defined in 2018 COA Addendum	Delta must be in excess for Sites Reservoir diversions	No change
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

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Incorporation of Mitigation Measure Fish-2.1 into Project

- RDEIR/SDEIS
  - Included Mitigation Measure FISH-2.1 to reduce potential life stage effects on salmonids by increasing the bypass flow requirement at Wilkins Slough
    - Minimum bypass flow requirement of 10,700 cfs at Wilkins Slough in March-May
- Final EIR/EIS
  - Project description now incorporates the requirements of Mitigation Measure FISH-2.1, which have been refined and made more restrictive (the revised diversion criteria on the previous slide)
  - The bypass flow requirement at Wilkins Slough has been developed as an integral component of how the Project is proposed to operate in terms of its water diversion criteria
  - The modeling performed for the Final EIR/EIS includes the revised diversion criteria
  - This eliminates the need for Mitigation Measure FISH-2.1 in the Final EIR/EIS

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Revised Modeling

- Adjustments made in the CALSIM II modeling between the RDEIR/SDEIS and the Final EIR/EIS to better represent the most up-to-date modeling procedures and actual operations, including:
  - Shasta Lake Operations – expanded exchanges to include more opportunities for fall flow stability and spring pulse enhancement
  - Deadpool Volume – reduced from generally 120 TAF to 60 TAF
  - Delta Salinity Accounting – slightly refined based on revisions to Calsim II coding
  - Period of Diversion to Sites Storage – revised to only include Sept 1 to June 14 to match water right application
  - South of Delta Water Delivery – revised to allow in any year that capacity is available (previously limited to below normal, dry and critically dry years)
  - Updates to Diversion Criteria – revised diversion criteria incorporated

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Facility Refinements

- The RDEIR/SDEIS noted that:
  - "Preliminary design for facilities described herein will continue to be refined and modifications may occur as needed as the Project proceeds to final design and as part of the ongoing value engineering process undertaken by the Authority."
- Admin Final EIR/EIS includes:
  - Sloped rather than vertical Inlet/Outlet (I/O) Tower
  - Single 32' diameter I/O tunnel replaces two 23' tunnels
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  - David Brick at dbrick@usbr.gov
  - Allison Jacobson at ajacobson@usbr.gov

22

Questions?

Sites

23

Sites

24

From: Alicia Forsythe [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=A6CDF06A7E904B65BAA21702A82AD329-AFORSYTHE]
Sent: 1/30/2023 5:02:37 PM
To: Becki Robins [brobins@palfreymedia.com]
CC: Ann Newton [anewton@katzandassociates.com]
Subject: RE: Contact Information & Follow Up
Attachments: Michel et al 2021 nonlinearflow.pdf

Hi Becki – Attached is the Michel study that was published in 2021 and that we are using as the basis of our Wilkins Slough diversion criteria. Although the publication is long, in essence it found that, based on the data analyzed, the survival of juvenile salmon though the Sacramento River was substantially greater when flows at Wilkins Slough were equal to or greater than 10,712 cfs. I think the quick synopsis is in Figure 6 on page 10 and the paragraph to the right of the figure.

In the conclusion on page 11, the authors go on to state "High flows promote favorable outmigration conditions for Chinook salmon juveniles, resulting in increased survival to the ocean (Connor et al. 2003, Smith et al. 2003). We identified an optimal threshold of 10,712 cfs, which we labeled historic mean, as it is similar to the longterm average of natural spring flow conditions under which Chinook salmon have evolved in this system (Fig. 1).

Happy to help or answer any additional questions.

Ali

Alicia Forsythe | Environmental Planning and Permitting Manager | Sites Project Authority | 916.880.0676 | aforsythe@sitesproject.org | www.SitesProject.org

---

From: Ann Newton <anewton@katzandassociates.com>
Sent: Monday, January 30, 2023 3:12 PM
To: Alicia Forsythe <aforsythe@sitesproject.org>; Becki Robins <brobins@palfreymedia.com>
Subject: Contact Information & Follow Up

Becki,

Thanks again for reaching out to us and for talking with Ali today. If you have any follow up questions, please feel free to email Ali (copied here) or me. Below are links to two of our follow up items:

Sites News Release: Sites Reservoir to Pursue Loan Through the Water Infrastructure Finance and Innovation Act
https://sitesproject.org/wp-content/uploads/2022/03/Final-WIFIA-ReleaseMarch2022.pdf

Water Education Foundation quantification of an acre-foot: https://www.watereducation.org/aquapedia/acre-foot

Ali will follow with a copy of the study mentioned.

Thanks again,

Ann

Ann Newton
Director, Los Angeles
d: 310.774.7639
San Diego · Los Angeles · San Francisco

From: Alicia Forsythe [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=A6CDF06A7E904B65BAA21702A82AD329-AFORSYTHE]
Sent: 1/30/2023 5:12:55 PM
To: Jerry Brown [jbrown@sitesproject.org]
Subject: RE: Interesting DCP EIR Stats

Thanks for sending. Carrie had a fantastic response to the opposition question. We don't quite have the community benefits program, but our approach is very similar.

Ali

Alicia Forsythe | Environmental Planning and Permitting Manager | Sites Project Authority | 916.880.0676 | aforsythe@sitesproject.org | www.SitesProject.org

From: Jerry Brown <jbrown@sitesproject.org>
Sent: Monday, January 30, 2023 11:59 AM
To: Alicia Forsythe <aforsythe@sitesproject.org>
Subject: Re: Interesting DCP EIR Stats

FYI – some other interesting points. This was from an update to the Delta Stewardship Council.

Next steps for permitting: The Department expects to start the formal consultation process with the California Department of Fish and Wildlife, National Marine Fisheries Service and US Fish and Wildlife Service in the upcoming months for endangered species permits. They expect to submit the change in point of diversion to the State Water Resources Control Board also in early 2023.

How much more water this year if the Delta Conveyance Project was built? Ms. Buckman put up a slide to show the pumping from the Delta for this water year. In October, November, and December, due to water quality standards and the hydrology, the Delta Conveyance Project, if built, would not have been able to divert any water. However, with the storm series that began at the end of December and into January, pumping in the south Delta was restricted from January 3 to 16 to protect Delta smelt. However, at the time, there was a lot of inflow into the Delta, and the Delta Conveyance Project, located in the North Delta and not being subject to the same restrictions as in the south Delta, would have been able to divert an additional 202,000 acre-feet during that time. Ms. Buckman noted that's enough for 2.1 million people, or or nearly 710,000 households for a year; it's also about 35% of the total volume of water exported by the State Water Project in 2022.

What about the opposition? During the discussion session, Councilmember Daniel Zingali noted that elected officials in the region have strong opposition to the Delta Conveyance Project. He asked Ms. Buckman if she foresees a path to address the opposition in the next year or so as this process goes forward, or are the differences over this project so deeply ingrained that when we get to the point of real consideration of this project, that opposition is still going to be very present.

"*The opinions that the elected officials are representing are the deeply held opinions of those in the communities*," said Ms. Buckman. "*One of the core tenets of our outreach approach is that we aren't* *trying to change the minds of people in the community. We're trying to listen to their feedback and understand it. So I don't necessarily anticipate that we are going to change people's minds."*

"*What we're trying to do is open communications, make sure we understand it, and to the extent that we can mitigate concerns through the environmental process, we're trying to do that,*" she continued. "*The last piece that we're really trying to work on is the community benefits program so that we have an avenue to try to account for those impacts that may not be covered within the CEQA process, which is pretty prescriptive. So we're really putting a lot of effort into developing that community benefits program.*"

"*But also we're very specific in the community benefits program that participation is not contingent on support or even neutrality on the project. We are happy to engage with people who do not support the project and continue to oppose it on this two-prong path where they will likely continue to oppose the project, but they can work with us in case the project moves forward that it would be done in as friendly a way as possible for the local communities.*"

From: Jerry Brown <jbrown@sitesproject.org>
Date: Monday, January 30, 2023 at 9:49 AM
To: Alicia Forsythe <aforsythe@sitesproject.org>
Subject: Interesting DCP EIR Stats

Public comments: The comment period for the Delta Conveyance Project closed in mid December. The Department received about 700 unique letters, totaling about 21,000 pages and 4,500 individual comments. They are currently cataloguing all comments and preparing to review and respond to those comments. A final EIR is expected toward the end of 2023.

From: Jerry Brown [jbrown@sitesproject.org]
Sent: 1/31/2023 6:46:01 AM
To: Kevin Spesert [kspesert@sitesproject.org]; Roger Gwinn [rgwinn@tfgnet.com]; Garrett Durst [garrett@naturalresourceresults.com]; keithdunn@me.com
Subject: Stanford Study on Drought Impacts on Low Income Communities
Attachments: Effect of Drought Surcharge Based on Income Levels.docx

The study I mentioned in yesterday's Govt Affairs meeting is attached. My key take-aways for Sites:

1. The ability of low income households to respond to drought surcharge and restrictions is more limited than higher income household.
2. Low income households are likely already using closer to health and safety quantities on a regular basis which means drought surcharges can actually raise the bills of low income households already struggling to pay when applied uniformly across all customers. (Sidenote -Some of this can be avoided through rate design, but not all of it because of limitations due to Prop 218.)
3. They talk about "infrastructure lock-in" and find this can disproportionately affect low income households greater than high income. They evaluate the cost impacts of a desal plant (because their study location is Santa Cruz). This is simply a function of the infrastructure having the effect of raising the base water rate which then exacerbates the drought surcharge effect.
(Sidenote – There are two shortcomings with this analysis 1) their assumption that all drought water supply infrastructure or temporary water sourcing increase the unit cost of serving water to all customers is not necessarily true because under Prop 218 water utilities have the ability to apply costs to certain customer classes in designing their rates and charges. For example, higher use households can be assigned the costs of the 'last increment" of water supply since the supply is being procured to support these uses, or new development can be assessed this cost, although this has to be backstopped by other customers if the development does not occur, and 2) low income rate assistance programs can be designed to mitigate the effect of raising the base water rate, however utilities are fairly limited in their ability to design assistance because of Prop 218 and must only use non rate revenues as the source of the cost offset for assistance which not all utilities have non rate revenue available for this purpose.)
4. I think generally the study supports the need for investment in drought reliability by urban water utilities to avoid negative effects of drought restriction and surcharge on low income households. The effect such investment has on low income households is very utility specific.
5. It would be useful if we could get one of our retailers to apply the researchers model to their specific situation and evaluate the findings specifically for Sites instead of a desal plant. Irvine Ranch would be good because I think they have water budget based rates.

I'd be interested to hear other thoughts and reactions.

Socio-hydrological drought impacts on urban water affordability

- Benjamin Rachunok &
- Sarah Fletcher

Nature Water **volume 1**, pages 83–94 (2023)Cite this article

Abstract

In water-stressed regions, droughts pose a critical challenge to urban water security for low-income households. Droughts reduce water availability, forcing water providers to invest in additional supplies or enact expensive, short-term emergency measures. These costs are frequently passed on to households through increased rates and surcharges, driving up water bills for low-income households and altering patterns of water consumption. Here we have developed a socio-hydrological modelling approach that integrates hydrology, water infrastructure, utility decision-making and household behaviour to understand the impacts of droughts on household water affordability. We present here an application based on Santa Cruz, California and show that many drought resilience strategies raise water bills for low-income households and lower them for high-income households. We also found that low-income households are most vulnerable to both changing drought characteristics and infrastructure lock-in.

Main

Unaffordable water prices threaten human health and well-being in the United States and beyond[1,2,3,4,5]. In California alone, one million people lack access to affordable clean drinking water[6]. Low-income households are disproportionately impacted by unaffordable water bills[4], with one-third of water systems in low-income areas of the United States charging unaffordable rates[7]. Unaffordable water threatens health by limiting both domestic water use[8] and other essential household expenditures. Indeed, 14% of the US population reports that a US$12 monthly increase in water bills would reduce access to groceries and basic medical care[9]. Water bills are currently increasing faster than inflation[3] and the strain of climate change on water supplies threatens to accelerate cost increases.

Droughts exacerbate affordable water access in many water-stressed regions by reducing water availability and increasing the cost of supplying water. Water providers must use expensive short-term mitigation measures such as curtailment or invest in additional water supplies[10,11] to provide reliability, but these measures may increase water rates[12]. Counterintuitively, these measures can reduce household water security by making water unaffordable for more people[13,14]. This impact is supported by empirical evidence from recent droughts that showed that households in urban areas of California paid higher water bills during drought periods[15].

Household water-use behaviour compounds the affordability challenges created by droughts and disconnects household and utility water security. During droughts, households change their water use as a result of drought-related water restrictions[13,16], responses to price increases[17,18], and changing water use based on socio-economic and demographic factors[19,20,21]. Household changes in water use in response to exogenous factors alter utility revenue and potentially necessitate additional rate increases. Accordingly, quantifying water affordability requires explicitly incorporating household-level water use and response to rate changes into broader drought planning and management decisions.

Previous studies have investigated drought impacts and solutions for water supplies, but have not captured the interaction between utility-level planning and household-level affordability impacts. In the field of decision support modelling, recent studies have developed low-cost approaches to drought resilience, including diverse supply portfolios[22,23], regional water transfers[12,24], demand management[20,25] and flexible capacity expansion[26]. Many studies have used exploratory modelling to analyse trade-offs between conflicting water resource goals, such as reliability, cost and ecosystem services, during droughts[27,28,29,30,31]. The infrastructure solutions required to address droughts often increase water rates[32], but household affordability is typically not included in these planning models. In the area of socio-hydrology, recent work has focused on developing a process-based understanding of coupled human water systems with the aim of identifying critical components, nonlinear interactions and feedback[33,34,35,36]. Recent studies have investigated the connections between human behaviour and flood[34,37], agricultural irrigation[36,38] and drought[39]. In both decision support modelling and socio-hydrology, existing approaches have focused on aggregate indicators at the city, watershed or regional scale, aligned with the scale of decision-making rather than impact, where household-level affordability is typically addressed separately from water-supply decisions via rate setting and low-income assistance programmes[40]. However, these solutions do not account for the effects of hydrological variability on water bills, potentially overlooking impacts on vulnerable households. Current models are therefore unable to capture water use and costs at the spatiotemporal resolution required to assess the differential affordability impacts of droughts across demographic groups, nor are they able to incorporate the changing household behaviour that occurs as a result of drought resilience measures. This is a key barrier to understanding the distributional equity implications of alternative approaches to drought resilience[41]. In short, the potential interactions between droughts and affordability are well known in many stressed water systems, but their interaction remains an emerging area for water resource researchers. A broad Web of Science literature search for the terms ‘droughts’ and ‘water affordability’ returned only 17 publications in the past 10 years.

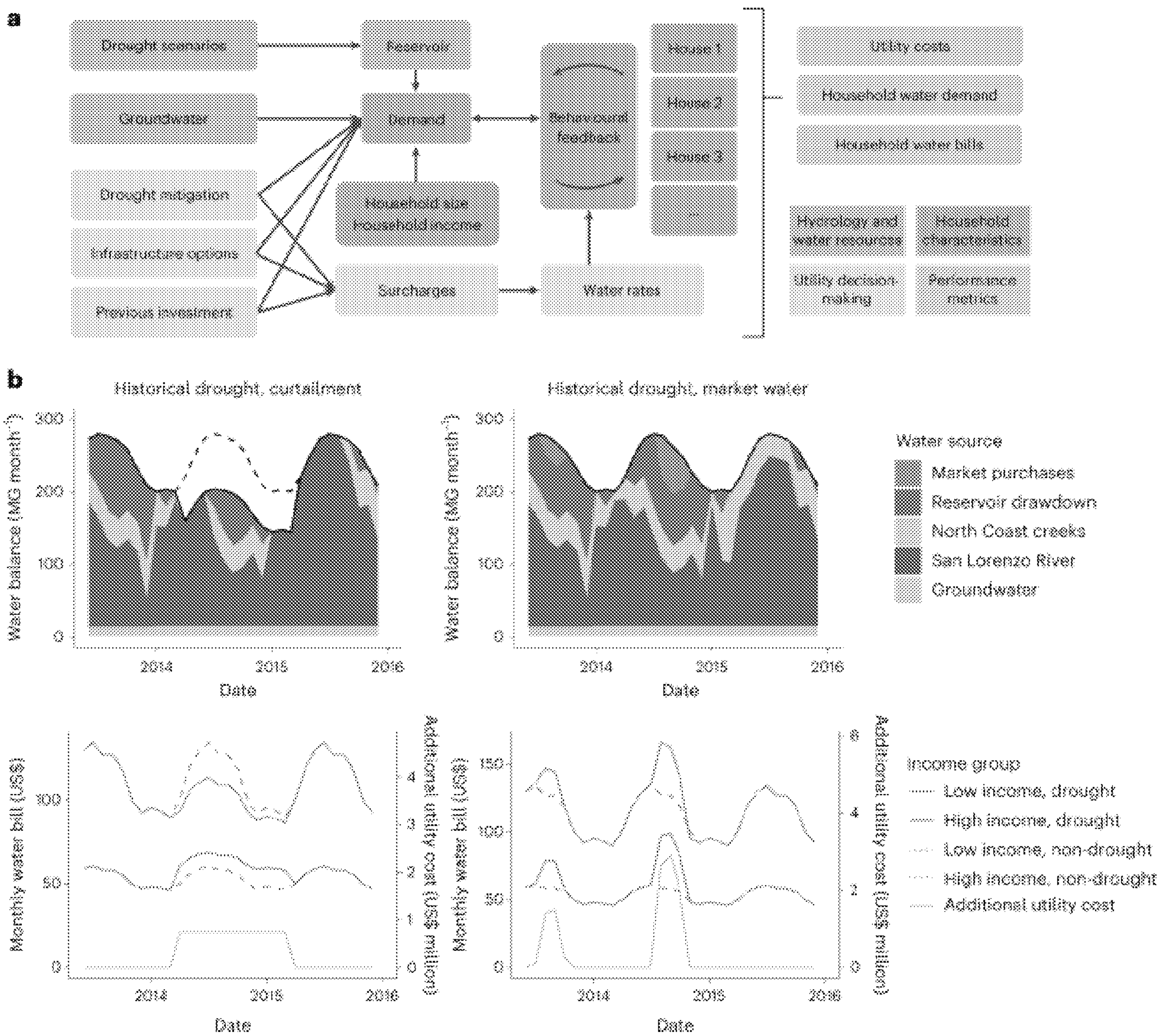
In this work we assessed the household-level socio-hydrological impacts of drought on water affordability. To do this, we developed a socio-hydrological process model of an urban water system that integrates hydrological drought scenarios: (1) utility water supply and rate decision-making, (2) storage, conveyance and treatment infrastructure, and (3) household water-use behaviour across income classes. We used this model to evaluate the impact of droughts on low-and high-income household water bills under different utility and household drought responses in an application based on Santa Cruz, California during the 2011–2016 drought. Santa Cruz is a coastal California public utility served primarily by surface water. The aim of this application was to develop process-based insights using realistic and generalizable model assumptions, not to design context-specific solutions for Santa Cruz. The results indicate that curtailment-based drought mitigation coupled with drought surcharges decreases water bills for high-income households and increases water bills for low-income households, highlighting the equity implications of drought mitigation decisions. We also found variability in drought characteristics (that is, persistence and intensity), and that changes in household water use in response to price signals disproportionately impact low-income households. We investigated the effects of infrastructure lock-in on affordability and found that higher pre-drought water rates lead to greater bill increases during drought. Finally, we discuss the generalizability and limitations of our findings.

Results

Water affordability modelling framework

We have developed a socio-hydrological modelling framework to assess process-based drivers of household affordability during droughts, including (1) utility cost increases from water-supply infrastructure expansion, temporary water sourcing and demand curtailment, (2) decreased water availability from droughts of varying persistence and intensity, (3) changes in household water use in response to price signals and (4) the impact of pre-drought utility decision-making (Fig. 1a). We simulated different drought scenarios, utility decision-making and household behaviour to determine the drought-related bill increases and surcharges for low- and high-income households as well as the water utility. We categorized low-income households as those below the California Poverty Measure for the region (US$36,000 yr^{-1}) and high-income households as those making over twice the median household income (US$135,000 yr^{-1}). Each household's water use was estimated on the basis of household size, income, price elasticity and response to curtailment mandates. Coupled with increased rates, this information was used to estimate the changes in household water bills resulting from droughts, supply expansion and short-term mitigation (Methods). We modelled drought impacts on affordability as the change in annual household water bills resulting from droughts for high- and low-income households. This approach connects watershed-scale hydrology with both city- and household-level drought decision-making and impacts, enabling assessment of the distributional impacts of drought on affordability.

Fig. 1: Schematic model overview and example model results.



a, Framework for the water affordability and utility planning model. **b**, Example water balance (top) and cost increases (bottom) during a historical drought in which curtailment (left) and market water (right) are used as drought mitigation measures. The dashed lines show the water use (top) and water bills (bottom) in non-drought conditions.

Full size image

Household affordability differs from utility costs

Using this framework, our first key finding was the decoupling of household water affordability and total utility cost during droughts. This occurs because of the combination of cost increases for utilities, which are passed to households as increased rates, and household water use reductions (Fig. 1a). We simulated the affordability impacts of two water-supply infrastructure expansions, temporary water sourcing and demand curtailment during multiple drought scenarios. In line with the legal and governance frameworks of our case study as well as the modelling approach used in this work, we assumed that all water-supply infrastructure expansions and temporary water-sourcing purchases increase the unit cost of supplying water, and that demand curtailment decreases retail revenue due to the reduced water sold. We modelled utilities as raising water rates or applying surcharges to fund the additional costs or revenue deficits (Fig. 1b, lower panels), resulting in moderate cost increases (US$0 to US$72 month^{-1}) across all scenarios and droughts. Households were modelled as responding to increased water rates or surcharges by reducing water use, and curtailment has the additional effect of mandated reduced household water demand. In the absence of rate increases, water use reductions create moderate (US$19 to US$77) decreases in water bills, based on a price elasticity of 0.35 (Methods).

We found that increases in the cost of water to households via surcharges and rate increases combined with household water-use reductions from curtailment and price responsiveness lead to an asymmetric impact of droughts across income classes, and a decoupling of total utility cost and household affordability. This occurs because these two components—the bill increase from rate increases and surcharges, and the decrease from water use reductions—are not equal. They result in a net increase or decrease in the cost of water during droughts that varies according to the magnitude of utility cost increases, household use reductions and the characteristics of the household. For low-income households in our case study, this results in low-to-moderate monthly cost increases (US$2 to US$72), whereas for high-income households the impact ranges from low decreases (US$42) to moderate increases (US$72). This asymmetry across income classes is driven in part by differences in pre-curtailment water use: high-income households use more water pre-drought and as curtailment was implemented by reducing household water by a percentage, high-income households curtail more during drought. Additionally, surcharges comprise a larger portion of total water bills for low-income households, leading to greater use reductions. Accordingly, a given amount of increased cost to utilities (through revenue reduction or increased spending) does not lead to a one-to-one impact on households. The resulting change in household affordability differs according to how the cost was incurred, and the characteristics of water use and price responsiveness for each household.

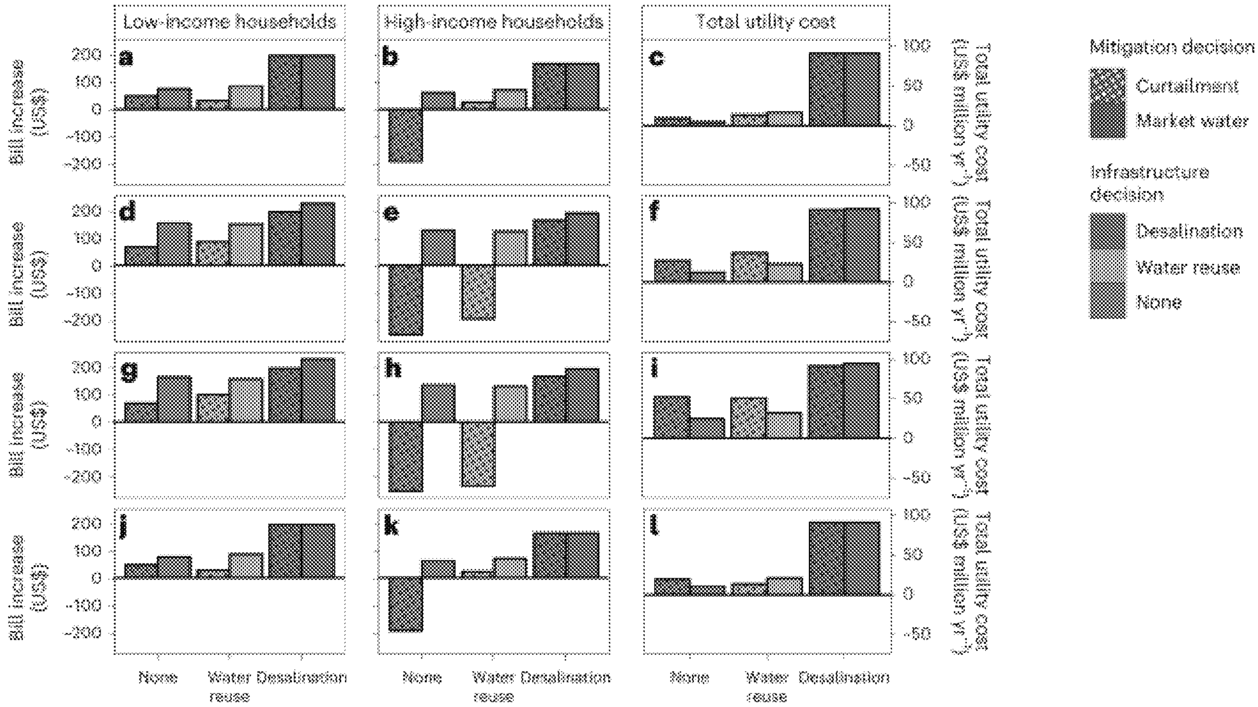
Note that throughout this work we report changing water bills as absolute bill increases either per month or per year for low- and high-income households, but we emphasize that this is just one of many ways to quantify affordability. Affordability ratios are a commonly used metric for quantifying water affordability in which water expenditure is divided by total household income leading to a percentage of household income spent on water[2,3]. This is often compared with a reference value to label water affordable or unaffordable[4]. Broadly, water is considered affordable if households are spending 2–4% of their income on their water bills[2,4]. For low-income households in our case study, an average pre-drought water bill is approximately US$54, leading to an affordability ratio of 5.2%. For a high-income household, an equivalent water bill would be approximately US$120, for an affordability ratio of 0.8%. This parallels a long-understood trend in urban water affordability in which unaffordability is largely an issue for low-income households[2,4,13]. Our results highlight that there are likely to be households for which drought surcharges are the difference between affordable and unaffordable water when quantified using affordability ratios. Furthermore, in our analysis, we modelled differences in bill changes across income groups as a measure of inequality. However, the same absolute bill change will disproportionately impact low-income households when using affordability ratios. Therefore, the equity impacts of droughts for low-income households are greater.

Utility decision-making and drought characteristics

We analysed the total affordability impacts of utility decision-making during droughts. We found that decisions made by utilities to expand water supplies, temporarily source water and curtail demand create different cost outcomes for low- and high-income households as well as the utility. We tested three water-supply expansion options: build no infrastructure, build a low-capacity water recycling plant or build a large-scale regional desalination plant. The water recycling plant has a total cost of US$20.4 million, an additional annual cost of US$330,000 and it provides 0.5 MG d^{-1} of capacity for a levellized cost of US$2,600 AF^{-1}. The high-capacity desalination option has a total cost of US$115 million, an additional annual operational cost of US$3.3 million and it provides 2.5 MG d^{-1} of capacity, with a levellized cost of water of US$4,300 AF^{-1}. We assumed that all infrastructure options are operational for 30 years and are financed with a 30 year loan at an interest rate of 3% (Methods). Should the given supply infrastructure be unable to meet water demand, one of two mitigation options would be implemented: purchasing water on a water market or curtailing residential water demand, where households are asked to reduce their water consumption (Methods). All utility decision-making was simulated during four drought scenarios: a historical drought, one more intense, one longer, and one longer and more intense (Methods).

We found that—across all drought scenarios—expanding supplies always increases costs for utilities, always reduces affordability for low-income households, but does not always reduce affordability for high-income households (Fig. 2b,e,h,k). The affordability outcomes for high-income households are driven by demand curtailment and temporary water sourcing. When utilities purchase market water to mitigate any water shortfall not provided by existing water supplies, costs increase for high-income households similarly to low-income households and the utility (Fig. 2, solid bars). However, when utilities implement demand curtailment, it leads to a large reduction in water use for low- and high-income households. For high-income households, this reduction fully offsets the cost increases from curtailment and results in water bill decreases (Fig. 2e,h,k, patterned bars). For low-income households, the reduction in water use from curtailment and price changes does not offset the mitigation and supply-expansion cost increases, reducing affordability (Fig. 2d,g,j, patterned bars).

Fig. 2: Stakeholder cost changes during droughts for given infrastructure, mitigation and drought scenarios.



a–**l**, One-year total cost increases for low-income households (**a**,**d**,**g**,**j**), high-income households (**b**,**e**,**h**,**k**) and the utility (**c**,**f**,**i**,**l**) compared with a non-drought period for four different scenarios: historical (**a**–**c**), intense (**d**–**f**), long and intense (**g**–**i**), and long (**j**–**l**) droughts for different drought mitigation and decisions. Negative numbers represent bill decreases and positive numbers represent bill increases.

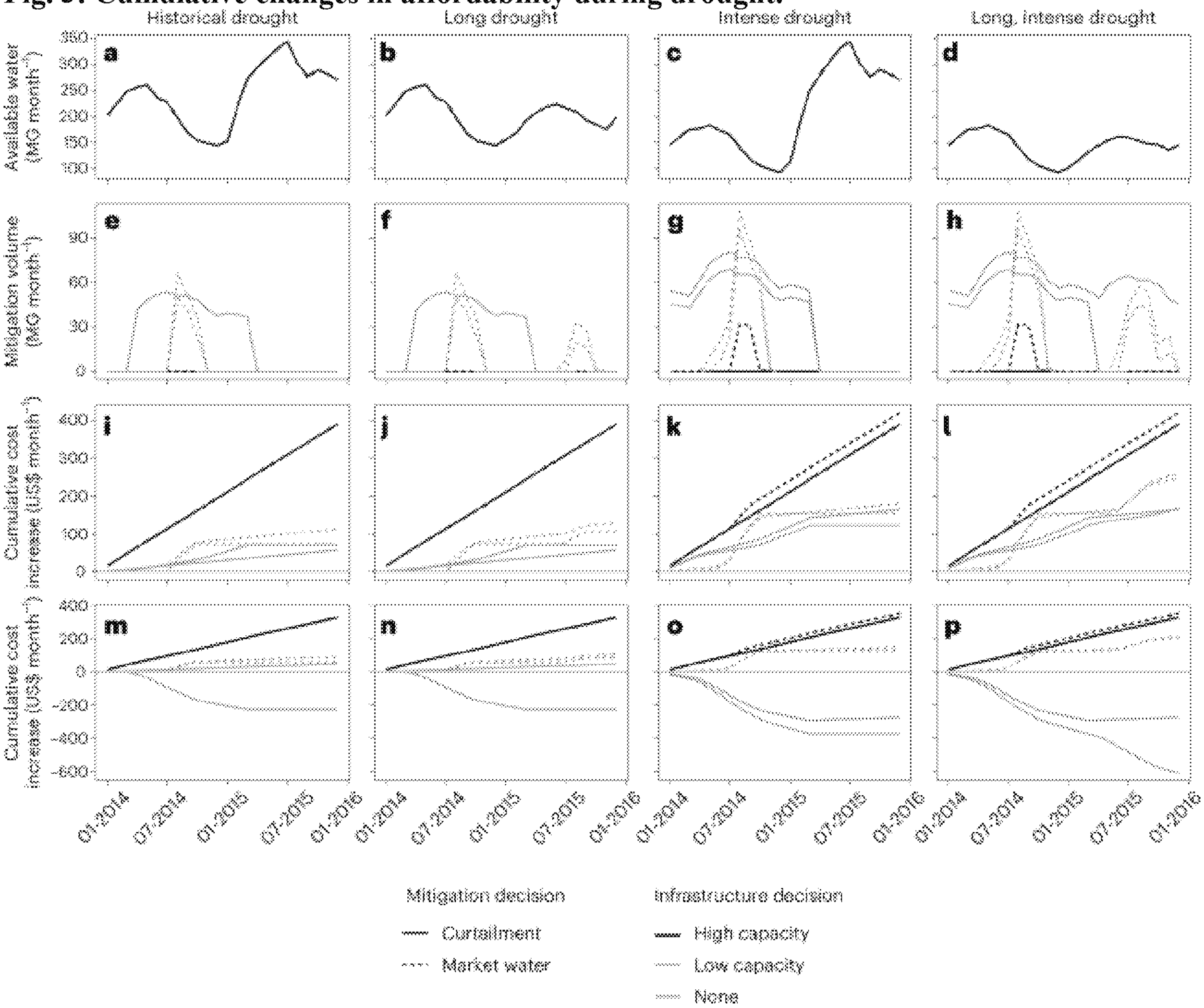
If supplies are expanded, the impact on low- and high-income affordability is dependent on the characteristics of the expansion option. Building infrastructure results in low cost increases for all populations, as long as there is enough capacity to prevent mitigation from being required. This occurs because the levellized cost of water (LCOW) for supply expansion is cheaper than the LCOW of mitigation measures (US$2,600 AF^{-1} versus US$7,200 AF^{-1}, respectively). Thus, when the size of the expansion is sufficient to supply water during the drought, cost increases are very moderate for all three stakeholders (Fig. 2a–c, blue bars). However, if the expansion is insufficient and requires temporary water sourcing or demand curtailment, the costs increase for low-income households and the utility and decrease for high-income households (Fig. 2d–f). Temporary water sourcing creates more variability in surcharges and leads to more even bill increases across populations (Supplementary Fig. 2).

We also quantified the impact of drought persistence and intensity on affordability across utility decision-making options. We found that drought intensity has the greatest impact on affordability as intense droughts require additional mitigation through temporary water sourcing or demand curtailment. Longer droughts extend the length of time bill increases are incurred, but still remain less expensive than intense droughts, and increase costs at a lower rate (Fig. 2). The greater cost of drought intensity is a direct result of the greater LCOW from mitigation compared with infrastructure decisions.

Temporal dynamics of bill changes

In addition to total cost increases during a drought, we examined the cumulative household affordability impacts resulting from utility decision-making and drought scenarios over time to compare the temporal dynamics of bill changes. For high-income households, the results indicate that the decision-making options that lead to the lowest total bill increases have the lowest cumulative cost at any point through the drought. However, for low-income households, the decision-making options that lead to the lowest cumulative affordability outcomes change throughout the course of a drought. This effect is mediated by temporary water sourcing and demand curtailment. We show aggregate water availability, the amount of mitigation required by each decision-making option and cumulative additional cost increases per month for low- and high-income households compared with non-drought periods in Fig. 3 (top row to bottom row, respectively). In Fig. 3i–p, the line showing the lowest value for a given point on the *x* axis represents the utility decision that results in the lowest cumulative cost increase up to that time period.

Fig. 3: Cumulative changes in affordability during drought.



a–**p**, Aggregate water availability from all sources (**a**–**d**), volume of mitigation required (**e**–**h**) and cumulative cost increases for low-income households (**i**–**l**) and high-income households (**m**–**p**), compared with a non-drought year, for different drought scenarios: historical (**a**,**e**,**i**,**m**), long (**b**,**f**,**j**,**n**), intense (**c**,**g**,**k**,**o**) and long and intense (**d**,**h**,**l**,**p**). A 6-month smoothing was applied for clarity in panels **a**–**d**. Each aspect was analysed for different mitigation and infrastructure choices.

Full size image

For high-income households and the utility, building nothing results in the lowest total cost increases as well as the lowest cumulative cost increases at any point throughout any drought scenario (Fig. 3m–p). However, for low-income households, the decision-making options that lead to the lowest total cost increases do not have the lowest cumulative costs throughout the drought. This implies that there is no unilaterally best utility decision-making option across all drought scenarios, nor throughout the duration of each drought for low-income households, and indicates that low-income affordability is driven by the interaction of drought duration and utility decision-making. This is visualized by the lines crossing in Fig. 3i–l.

This demonstrates that low-income households are potentially vulnerable to uncertainty in future drought conditions. In our case study, for a utility aiming to minimize the affordability impacts of droughts for high-income households, one decision would lead to the best total affordability and cumulative affordability outcomes throughout a drought regardless of drought scenario. However, a utility would need to know the specific duration and intensity of a drought to minimize the affordability impacts of droughts for low-income households, as incorrect decision-making with respect to drought length or intensity only creates negative outcomes for low-income households.

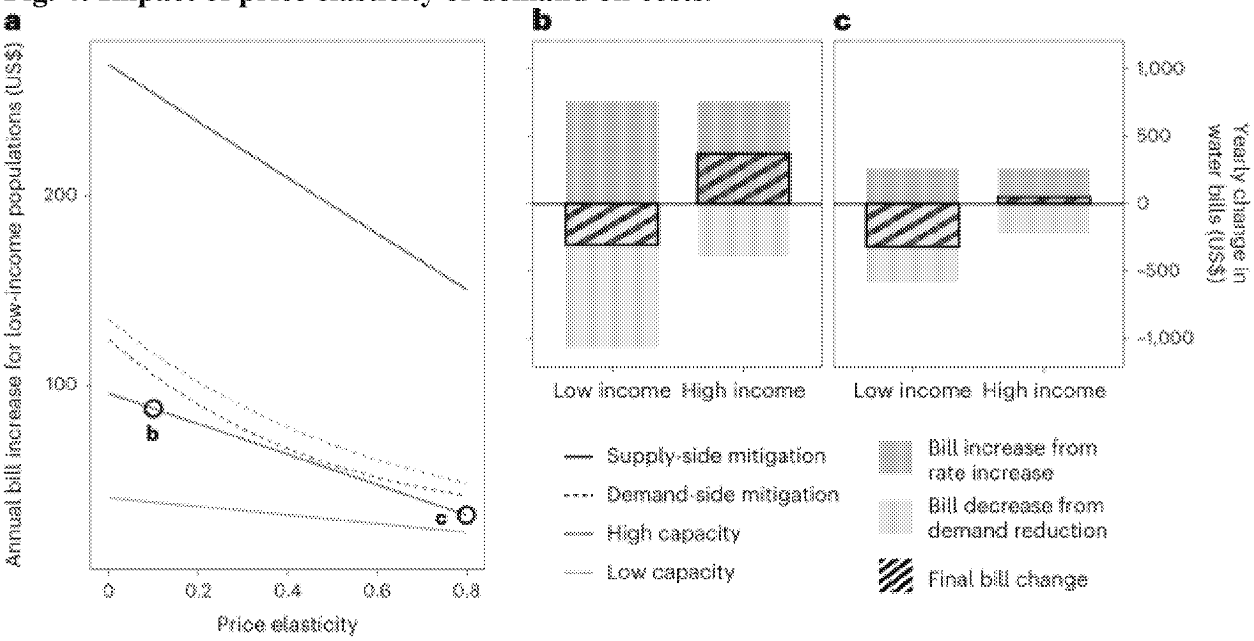
We also note that under our present modelling assumptions, the high-capacity desalination plant never provides favourable affordability outcomes. This is due to the capacity and levellized cost: in the worst drought scenario, for affordability, it is better to implement the low-capacity water recycling programme and mitigate the remaining deficit. However, this would likely change over a longer time horizon. By comparing the LCOW for mitigation and the high-capacity desalination plant, we estimated that a long, intense drought approximately 1.8 times the length of the scenarios tested in this work would lead to the desalination plant providing the most favourable affordability outcomes.

Demand response

One contributing factor to the difference between total utility cost and household affordability is changing household water use in response to price increases. We modelled each household as having a response to changing water rates using a price elasticity of demand (PED) parameter (Methods). Estimates of PED for household water use vary across regions[18], thus we varied PED between 0 and 0.8 in increments of 0.1, reflecting inelastic but non-zero price elasticity of water demand. A PED of 0.1 means a household will respond to a 10% increase in price with a 1% reduction in household water use.

We found that greater ratepayer price elasticity largely improves affordability outcomes for all stakeholders (Fig. 4). Low-income households experience smaller bill increases with greater price elasticity (Fig. 4a). High-income households experience a reduction in their bill decreases due to drought (that is, their bills still go down during droughts, but by less). These results stem from the household reaction to price changes that follow from increased utility costs. At higher PED values, utility decisions with higher cost increases lead to greater reductions in demand. This highlights the connection between PED and adaptive capacity: when households respond to price signals, they add virtual water-supply capacity to the system. This happens across all supply expansion and mitigation measures, and is more pronounced for more expensive options. This can be seen in Fig. 4a by the slopes of the lines connecting the costs at different PED values.

Fig. 4: Impact of price elasticity of demand on costs.



a, Annual cost increases for low-income populations under increasing levels of price elasticity. Solid lines show supply-side (market water) mitigation and dashed lines show curtailment. **b,c**, Annual total bill changes for low- and high-income households when the price elasticity is 0.1 (**b**) and 0.8 (**c**). Low-income households are those with an income below US$36,000 yr^{-1}, and high-income households are those with an income over US$135,000 yr^{-1}.

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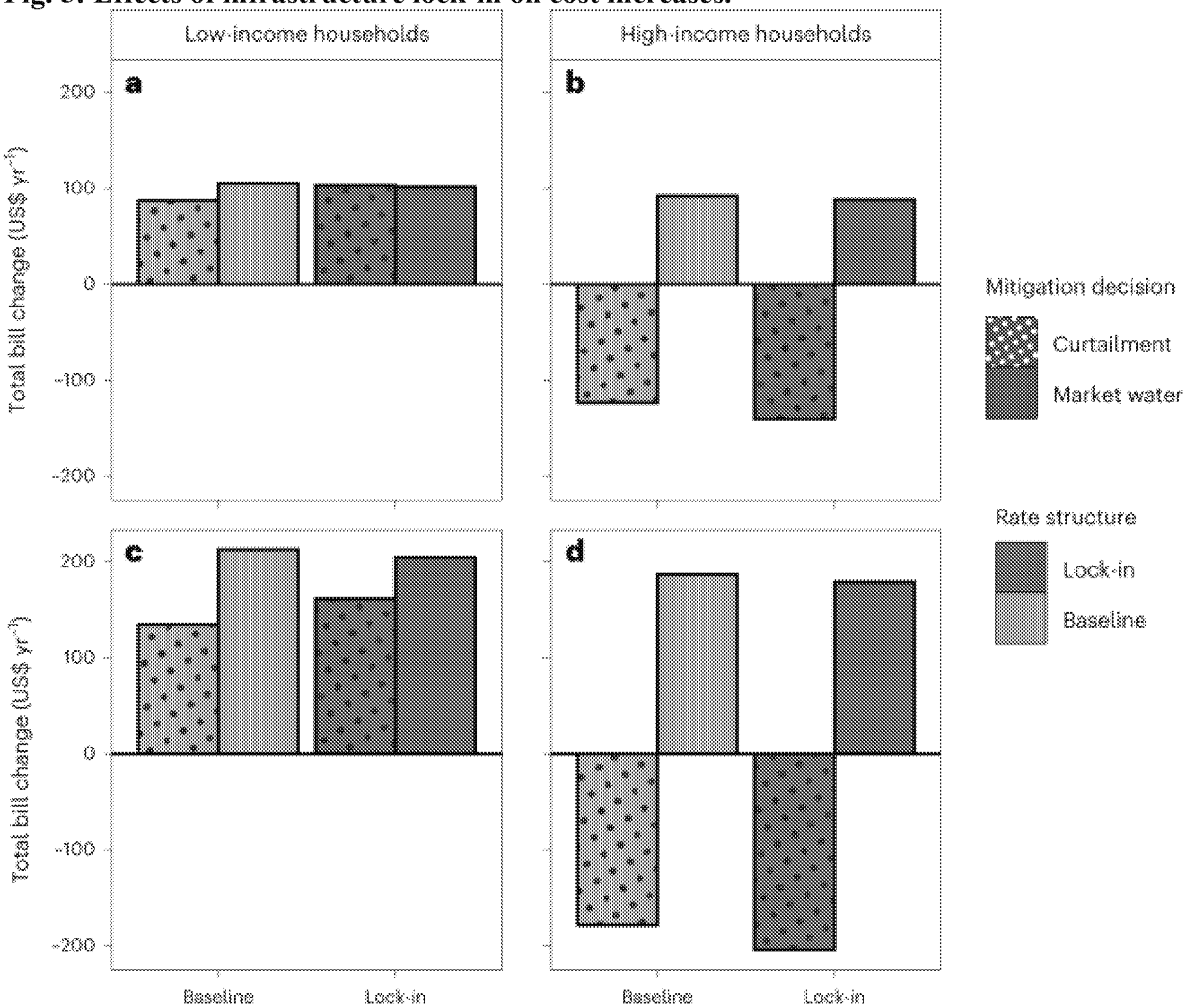
We also found that heterogeneous price sensitivity across income classes impacts all households. We tested a scenario in which we decreased the price responsiveness of low-income households and a scenario in which we decreased the price responsiveness of high-income households (Methods). We found that when either income class shows less price responsiveness, bills increase for all households, but less so for the more price-responsive group (Supplementary Figs. 6 and 7). Thus, if any income class shows less price sensitivity, demand reductions in response to price changes are limited. This ultimately leads to greater total water demand, and subsequently greater deficits and surcharges.

Infrastructure lock-in

We found that water bill changes during droughts are a function of the pre-drought base water rates. Water-supply infrastructure decisions made pre-drought therefore affect affordability during droughts (Fig. 5). We show this by raising pre-drought water rates to reflect a scenario in which the utility has previously invested in a high-capacity desalination plant. This phenomenon is called infrastructure lock-in and occurs when utilities invest in expanding water-supply capacity in anticipation of future need, but due to hydrological uncertainty do not ultimately require the additional capacity[42]. Lock-in represents a potential negative consequence of large-scale supply investment due to increased and unneeded financial liability.

Fig. 5: Effects of infrastructure lock-in on cost increases.



a–**d**, Total annual cost increases for low-income households (**a**,**c**) and high-income households (**b**,**d**) during a historical drought scenario (**a**,**b**) and a long, intense drought scenario (**c**,**d**).

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We found increased costs to utilities incurred through lock-in also impact affordability, with impacts mediated by temporary water purchases and demand curtailment. Elevated base water rates exacerbate drought-related bill increases for low-income households and bill decreases for high-income households when demand curtailment is used (Fig. 5). This effect holds across all drought scenarios and results from the greater revenue loss that occurs for a given amount of curtailment when base rates are higher. This necessitates a greater surcharge to make up the deficit. Elevated base water rates reduce drought-related cost increases for high- and low-income households when purchasing market water to add temporary supply (Fig. 5). This reduction occurs because of price responsiveness, as the increased costs from higher base rates lead to a greater reduction in household demand.

Discussion

We have developed a socio-hydrological modelling framework to assess the drivers of household affordability during droughts, including utility cost increases, drought characteristics, household water use and pre-drought utility decision-making. This addresses a critical limitation of current water-supply planning: the lack of spatiotemporal resolution and socio-hydrological feedbacks required to quantify the drivers of household water affordability during droughts. The results from the application demonstrate the nuance and trade-offs between utility-scale decision-making and affordability for high- and low-income households. Importantly, low-income households are disproportionately impacted by demand curtailment coupled with increased water rates and, more broadly, we found that low-income households are the most sensitive stakeholder to utility decision-making and variable drought characteristics.

Incorporating multiple stakeholders into socio-hydrological models is critical to understanding affordability during drought and non-drought periods. This work adds to a substantial body of existing literature emphasizing that affordability calculations based on regional median levels of household income and water use fail to capture the full scope of affordability impacts on households. Given that we see many scenarios in which low-income households experience bill increases, and high-income households experience bill decreases, reporting only aggregated or median bill changes would likely hide the disproportionate impact of droughts on low-income households. Additionally, we see interactions between stakeholders when high- and low-income households have differing price responsiveness. When either low- or high-income households show less demand response to changes in water price, overall residential water demand is higher, leading to greater mitigation needs and increased surcharges for all populations. This connection between the actions of one stakeholder group and the outcomes of another further emphasizes the importance of incorporating multiple stakeholders into socio-hydrological models to assess distributional equity.

We also see a consistent trade-off between utility-scale decision-making and affordability, especially in the impact of expanding water supplies on low-income water affordability. We found that under-expanding supplies relative to a given drought worsens affordability outcomes for low-income households. However, under certain circumstances, infrastructure lock-in also worsens affordability outcomes. This parallels a long-established trade-off in infrastructure planning under uncertainty between maximizing reliability through building larger infrastructure and minimizing cost but exacerbating impacts for vulnerable households. Furthermore, there is no unilaterally best decision-making option for low-income households across drought scenarios, emphasizing that performing an affordability analysis at only a household or utility scale may be incomplete. Ongoing work is aiming to extend the computational planning tools used to address this trade-off in systems-level water resources planning to incorporate household-level water affordability.

A major challenge in this work was choosing the measures to quantify affordability during droughts. The persistence of droughts necessitates developing additional affordability metrics that capture the long-term financial burden of accumulated, drought-related rate increases. Here, we used annual bill increases through a drought as our measure of affordability for ease of comparison across household classes, but recognize that this is just one of many ways to quantify affordability over time. For comparison, we performed the same set of analyses and instead quantified the maximum one-month increase in rates experienced by high- and low-income households (Supplementary Fig. 2). Our findings remain largely consistent when looking at maximum bill increases compared with total bill increases, but the two do not perfectly correlate with the mitigation measure driving the difference: demand curtailment leads to rate increases spread out over a longer period of time, while market water purchases focus rate increases in short periods. Future work will explore additional metrics to capture the impact of temporal variability in droughts on affordability and how utility decision-making can be optimized with respect to low-income affordability over a larger number of drought scenarios.

Modelling household water use was another key component of this study. We modelled households as having an inelastic but non-zero response to changes in price. A considerable amount of work has been carried out aiming to estimate the price elasticity of household water demand, with current best estimates ranging from 0.1 to 0.8 (ref. 18). We performed our analysis assuming a price elasticity of 0.35, based on a suggested value from Dalhuisen et al.[18]. We aim to extend future work to include empirically derived price elasticity values that differ according to household income and other demographic characteristics, as well as other mechanisms for increasing water rates in response to utility cost increases. This approach could allow water demand estimates to be developed that capture (1) city-specific behaviour, (2) changes in time resulting from demand hardening and (3) correlations between drought conditions and water demand. Demand hardening is especially important to consider when evaluating drought impacts, as persistent or repeated droughts lead households to make permanent changes to water use, for example, installing water-efficient appliances and drought-tolerant landscaping. This limits the ability of repeated curtailment to successfully mitigate water shortages.

We note that there are a myriad of solutions to mitigate drought impacts and address affordability that we have not included in our model but that would likely have favourable outcomes. One possibility is to raise water prices during non-drought periods to promote conservation instead of raising them in response to increased drought-related costs. This may worsen affordability through increased costs or, depending on the price elasticity, could improve affordability as long-term conservation and efficiency lead to lower water use. However, if costs increase dramatically, conservation pricing could drive low-income households to conserve more than is healthy. Additionally, hardening demand could prove extremely costly in future droughts as it limits the utility of curtailment as a mitigation strategy. Similarly, there are many existing and under-development local, state and federal low-income rate-assistance programmes that typically take the form of rebates or discounted marginal water rates[43]. Similarly, state or federal grant programmes could be designed to provide assistance to utilities to minimize rate increases. In ongoing work we are evaluating the efficacy of different low-income assistance programme structures under drought conditions.

Finally, while Santa Cruz is in many ways representative of large public water utilities in California, there are specifics of the case study we have chosen that prevent these results from being universally applied. First, Santa Cruz was a heavily water-stressed region during California's most recent drought[10]. Additionally Santa Cruz is coastal, which opens the possibility for developing high-capacity desalination plants. However, we note that we only modelled increased capacity, not the specifics of the technology in our approach, meaning that this approach would generalize to any additional high-capacity water sources. The utility is also public, which constrains how curtailment is implemented, and this may differ should it be an investor-owned utility. Finally, alternative regional demographics may change revenue losses during curtailment, which may affect how surcharges are applied to high- and low-income households. We detail the specifics of how changes in these attributes impact our results in the Methods.

Methods

We have developed a socio-hydrological model based on Santa Cruz, California, a large retail water system on the central coast of California that was heavily impacted by a drought from 2011 to 2016[10]. Socio-hydrology models focus on developing an understanding of how coupled human hydrological systems function with the aim of identifying the critical components, nonlinear interactions and feedbacks[36]. We used our framework to examine the coupled dynamics of water utilities, human behaviour and hydrology that govern water affordability during droughts. Broadly, we did this in three parts. First, we modelled utility decision-making in response to hydrological drought scenarios, where utilities choose drought resilience measures to respond to drought and adjust water rates accordingly. Second, we linked drought resilience measures and rate increases to household water use through a price elasticity parameter. Third, we estimated household water use and calculated household water bills throughout the duration of a drought.

Water resources

We modelled source water supplies and infrastructure for water storage, conveyance and treatment. Santa Cruz, California has three surface water sources and one ground water source (see study area in Supplementary Fig. 1). One of the three surface water sources inflows to Loch Lomond, a reservoir with a capacity of 2,800 MG. The reservoir is the only source of water during prolonged droughts and is heavily managed with a required environmental flow release of 20 MG d^{-1}. The water balance for our systems model is shown in equation (1).

$$S_{t+1}=S_t+I^{N}_t+I^{S}_t+I^{R}_t+I^{G}_t+I^{B}_t+I^{WM}_t-D_t-W_t-E_t-C_t$$
St+1=St+ItN+ItS+ItR+ItG+ItB+ItWM−Dt−Wt−Et−Ct

(1)

Here, S_t is the storage in the reservoir at time t and S_{t+1} is the storage in the reservoir at time $t + 1$. I_{Nt}ItN, I_{St}ItS, I_{Rt}ItR, I_{Gt}ItG, I_{Bt}ItB and I_{WMt}ItWM are inflows from the North Coast creeks, San Lorenzo River, Newell Creek, groundwater, additional built infrastructure and water-market purchases, respectively. D_t is the total municipal demand in time period t adjusted for changes in curtailment and price elasticity, $W_t$is managed reservoir withdrawal, E_t is net reservoir evaporation calculated from Santa Cruz's projected water supplies[44] and C_t is an environmental flow release of 20 MG d^{-1}.

In April of each year, the management policy for the year is determined on the basis of the available forecasts of water demand and availability of the city's sources. Given the available supply and projected demand, the withdrawal from the reservoir is limited such that the reservoir storage in October will be sufficient to provide enough water given that the following 2 years have the water supply of the driest year on record. If in April there is still projected to be a water deficit, mitigation actions (described below) are taken to meet any additional deficit.

Drought scenarios

We created four hydrological drought scenarios for the years 2009–2016. The first was based on the historical hydrology experienced by the system during California's 2011–2016 drought. We used water rights data to quantify the amount of water used by the utility from each source. We generated alternative drought scenarios for each water source by varying the persistence and intensity of the 2011–2016 drought. To create a more intense drought, we increased de-seasonalized anomalies by a factor of 1.5, and to create a longer drought, by duplicating the anomalies of the worst drought years—2014 and 2015—into 2016 and 2017. The longer, more intense drought scenario was created by duplicating the amplified anomalies in 2014 into 2016 and 2017. These changes were applied to all three surface water sources. In all scenarios, we used historical groundwater withdrawals as they represent <5% of the water supply for the city.

Infrastructure

We analysed scenarios in which the utility expands water supplies by building additional water-supply infrastructure. We analysed two infrastructure options in this work: a 2.5 MG d^{-1} high-capacity desalination plant and a 0.5 MG d^{-1} low-capacity water reuse project. The water reuse option would build an additional water treatment plant for treating tertiary effluent that is subsequently used for irrigation at 34 customer sites in the city. These irrigation sites currently use fresh water supplies; thus, replacing them with recycled water increases available municipal fresh water supplies by an estimated 0.5 MG d^{-1} (ref. 45). These options were selected after consulting reports outlining all potential supply expansion options for the example city and have the lowest LCOW among all low- and high-capacity options.

We assumed that all infrastructure options are financed with a 30 year loan at an interest rate of 3%, terms based on California's general obligation bonds, which are frequently used to finance these types of infrastructure project[7,44]. The high-capacity option has a total cost of US$115 million, additional annual operational cost of US$3.3 million, with a LCOW of US$4,300 AF^{-1}. The low-capacity option has a total cost of US$20.4 million, an additional annual cost of

US$330,000 and it provides 178 MG yr^{-1} of capacity for a levellized cost of US$2,600 AF^{-1}. Our model assumes that all infrastructure is built and fully operational at the beginning of each simulated scenario and that the additional cost of building infrastructure is passed on in water rates, as described in the following sections.

Mitigation

During droughts, the available freshwater supplies may not meet demand. In this case, the deficit between supply and demand must be made up either by reducing demand though curtailment or by temporarily augmenting supply via purchases on the water market. We modelled curtailment as a fixed percentage reduction of residential demand. The percentage was estimated every April to meet the expected deficit without overdrawing on the reservoir, reflecting current drought management plans in Santa Cruz[46]. We assumed that the curtailment request is fully met by all households, stays in effect until the end of the calendar year and has no lasting impact on demand after the drought.

To model temporary supply-side water augmentation, we assumed that our example system has access to a large water market and the ability to purchase water as necessary on a month-by-month basis. Market water costs vary significantly, even under similar drought conditions[47]. We assumed that the unit cost of market water is equal to the price that residential consumers pay. This results in an equal LCOW for conservation and market water purchases of US$7,200 AF^{-1}. Our motivation for this modelling choice was twofold. First, we aimed to reduce the influence of financial market variability on our results so that they do not obscure process-based insights. Second, by giving curtailment and market purchase the same unit price, we could directly compare differences due to behaviour change and implementation timing. To validate our approach we modelled historical water availability data during the 2011–2016 drought in Santa Cruz. In 2014, the city asked residents to curtail water use by 25% in response to the drought[46]. We estimated that a 27% curtailment was necessary to balance water supplies and demand during the same period.

We also modelled drought mitigation occurring through supply-side measures. Water transfers are an increasingly common way for utilities to meet water deficits through supply-side means[48]. We incorporated this by assuming that our example system has access to a large water market and the ability to purchase water as necessary on a month-by-month basis. Market water costs vary significantly, so to avoid results biased by a potentially high or low water cost, we fixed the unit cost of market water to be equal to the unit cost to buy water under the current retail rates. This results in a LCOW for conservation and market water purchases of US$7,200 AF^{-1}. Our aim by this was to directly compare supply- and demand-side mitigation as purchasing one unit of water on the market will have the same financial impact on the utility as reducing demand by one unit.

Utility finances

The current rate structure has a fixed charge with four tiers of increasing block rates for progressively higher water uses, typical of many urban water rates[49]. We modelled household water bills as a sum of a baseline bill and three types of additional cost that a utility can incur: (1) servicing a debt payment and increased operational cost from building infrastructure, (2) additional one-time costs to purchase market water as a form of supply-side mitigation and (3) an increase in rates to account for revenue loss due to curtailment. These additional costs are passed on directly to ratepayers through surcharges. In California, Proposition 218 limits the ability of utilities to increase water rates and the most common way drought-related surcharges are added to bills is by evenly distributing any cost increases across the base of ratepayers[15]. A study of selected California utilities with drought-specific water rates found that 75% use fixed surcharges to recover drought-related costs[15]. In the specific case study of Santa Cruz, we predefined drought surcharges in line with Proposition 218 guidelines[50]. More broadly, revenue neutrality is a goal of conservation-oriented rate setting[51] and is generally aligned with the American Water Works Association principles of water rate setting[52].

This pass-through mechanism means that all bills would go up by the same amount. We validated our billing model against the current surcharges used by the City of Santa Cruz. The City assigns a per bill charge of US$2.45, US$6.12 and US$9.79 to recoup annual deficits of US$1, US$2.5 and US$4 million, respectively. Our model calculated a charge of US$1.75, US$5.54 and US$9.26 for the same cost recovery amounts.

Demographics and ratepayer behaviour

We calculated residential water use in the service area as the sum of household water use across income classes. We estimated household water use separately for 16 income classes using an econometric model that includes price and income elasticity. For a given household class c, we calculated their demand in month t, d_t^c, as:

$$d_t^c = \bar{d}_t m_c I_P I_Y (1 - r^t) \tag{2}$$

Each class is an income bin from US$10,000 up to US$250,000+ yr^{-1}, taken from the standard 16-node census income distribution[53,54]. For each class, we began with a cyclostationary, per-capita water use for the region in month t, $\bar{d}_t$, taken from reported monthly water use in Santa Cruz[44]. This was multiplied by m_c, the average household size for houses of class c, calculated using Integrated Public Use Microdata Series (IPUMS) microdata[55]. This water use was then adjusted for changes in price by a factor I_P using a price elasticity parameter ϵ_p such that

$$I_P = 1 + \epsilon_p \left(\frac{P^{t-1} - P^{t-2}}{P^{t-2}} \right) \tag{3}$$

where P^t is a household's water bill in time period t and P^{t-1} and P^{t-2} are the bills for time $t-1$ and $t-2$, respectively. Similarly, water use was adjusted for changes in income relative to the median by a factor I_Y such that

$$I_Y = 1 + \epsilon_y \left(\frac{Y_c - Y_{MHI}}{Y_{MHI}} \right) \tag{4}$$

where Y_c is the household income of class c, Y_{MHI} is the median income of the population and ϵ_y is the income elasticity of demand. Curtailment in time period t, r^t, is represented as a number from

0 to 1, where $r^t = 0$ indicates no curtailment and $r^t = 1$ indicates 100% curtailment. Curtailment was applied across households uniformly (for example, r does not vary across classes). Finally, the class demand, d_{tc}, was multiplied by the count of households of each income bin in the service region, H_c, which is tabulated in the 2015 American Community Survey[56], and summed over all classes to give the total residential utility demand in time t, $D_t^{utility}$:

$$D_t^{utility} = \sum_c d_{tc} H_c \tag{5}$$

Our approach to calculating household water use was based on current literature suggesting that household size is a significant driver of indoor water use and household income a driver of outdoor water use[21]. We adjusted for household size by calculating the average household size of each income class, m_c. Similarly, we adjusted for water use based on income using an income elasticity, ϵ_y, of 0.15, using a convention for positive income elasticity in which a marginal increase in income leads to a marginal increase in water use. This value was taken from a recent meta-analysis of retail water income elasticity values[54] and used for all analyses and figures presented in this paper. For completeness, we also tested two alternative income elasticity values, namely 0 and 0.4, and have included the results in Supplementary Figs. 3 and 4. Except for experiments in which we tested the sensitivity of ϵ_p, we used a constant value of 0.35 across income classes, taken from a meta-analysis of price elasticities of retail water[18]. Here, we used a convention in which a positive price elasticity indicates that a marginal increase in price leads to a marginal decrease in water use.

Sensitivity analyses

We performed a number of additional sensitivity analyses in addition to those presented in the Demand response section. First, we analysed alternative price elasticity estimation approaches. Residential water use differs from many other consumer goods in that water users alter their consumption in response to changes in average rather than marginal prices[57,58,59]. We included this in our baseline model by calculating price elasticity on the basis of changing average price, which leads to households responding to the addition of flat surcharges. We also modelled an additional scenario in which consumers respond to changes in marginal price, but flat surcharges are applied, altering the average price but eliciting no change in the marginal price of water (Supplementary Fig. 5). In this alternative model, consumers do not respond to price changes. The results show similar dynamics to the price elasticity sensitivity results: a small or non-existent price sensitivity increases bills for all households as they do not lower their water consumption in response to increased rates.

We also tested scenarios in which we varied income elasticity (YED). The results in the main text are reported using an income elasticity value of 0.15, representing a suggested income elasticity value from Havranek et al.[54]. We also ran sensitivity analyses using income elasticities of 0 and 0.4 (Supplementary Figs. 3 and 4). For a YED value of 0 compared with 0.15, water use is higher for low-income households and lower for high-income households. As Santa Cruz has a higher proportion of high-income households than low-income households, this reduces demand by approximately 10%. When YED was increased to 0.4, water demand was higher by about 20%. At lower YED values, the cost increases due to drought are largely the same for high- and low-income households (Supplementary Fig. 3). This occurs because their baseline water use is only differentiated by differences in household size. More importantly, the lower total residential demand eliminates the need for drought mitigation, which leads to bill increases for low-income households and decreases for high-income households when curtailment is used. At higher elasticity values (Fig. 4), demand is significantly increased, leading to greater curtailment. The disproportionate impact of curtailment on high- and low-income bill increases is exacerbated, and total costs increase for the utility.

Finally, we performed a sensitivity analysis in which we let price elasticity vary with income (Supplementary Figs. 6 and 7). There is a growing body of literature that indicates heterogeneous price responsiveness with respect to income or water use. Some work indicates that low-income customers are more sensitive to price than high-income households[59], while other work provides contrary evidence that "price elasticity is largely invariant to household wealth" and high water users are more price responsive[60]. Given the discrepancy between these findings, we performed two additional analyses in which we let price elasticity vary with income. In the first, we assumed that high-income households have 0 elasticity, and price responsiveness increased linearly as income decreased until the lowest income classes had a PED of 0.35. This demonstrates a finding similar to that of El-Khattabi et al.[60] in which low-water-use households respond to price signals and high-water-use households do not. In the second sensitivity analysis, we assumed that low-income households have 0 elasticity, and price responsiveness gradually increased across income classes until the highest income classes had a PED of 0.35. This experiment demonstrates the case in which high-income households respond to price signals but low-income households do not.

Case study attributes

The aim of this work was to develop process-based insights using realistic and generalizable model assumptions, not to design context-specific solutions for Santa Cruz. While the approach is fully general and can be readily applied to other cities, aspects of the specific case study that we chose limit the generalizability of the results. We describe these attributes here.

The City of Santa Cruz operates as a public utility and is accordingly governed by California Proposition 218 (ref. 50), which strictly governs water rate setting, including drought surcharges. The disproportionate impact of droughts on low-income households will apply when flat drought surcharges, or other regressive surcharge structures, are applied. Flat surcharges comprise the majority of surcharges imposed in California[15]. As an alternative to public utilities, investor-owned utilities (IOUs) are private utilities and in California are subject to regulation by the California Public Utilities Commission. Rate increases from IOUs must be proposed in advance and justified on the basis of utility expenses, details of any infrastructure improvements and expense projections[61]. This process happens approximately every 3 years. Given the alternative regulatory structure and utility business model, drought impacts on low-income households in IOU service areas may take the form of gradual rate increases over time rather than short-term impacts.

Current and available water resources also shape the drivers of water affordability. Santa Cruz does not have access to significant groundwater sources (they comprise approximately 5% of available supplies). We hypothesize that utilities with greater access to groundwater resources would be able to use groundwater to mitigate drought impacts by using groundwater when surface water is scarce. Santa Cruz is also a coastal community. Our high-capacity infrastructure option comprises building a costly desalination plant, and while it does not provide the best affordability outcomes in any scenario that we tested, this type of high-capacity, always-available water source may not be available for all utilities. We also assumed that additional supply infrastructure expansion and temporary water sourcing increase the unit cost of supplying water, which is likely the case in water-stressed regions in which existing supplies have been explored, but this may not be the case in areas with significant freshwater supplies.

Finally, many of our results are shaped by the region's demographics. We used the distribution of household income as inputs to our demand model, and in Santa Cruz there is a high proportion of households in the highest income bracket. We hypothesize that alternative household income distributions would impact affordability as this would change the proportion of utility revenue from high and low water users, thus affecting the revenue losses during curtailment.

Data availability

All raw data used in this manuscript are freely available: hydrological scenarios derived from California Water Rights Databases[62](https://www.waterboards.ca.gov/waterrights/water_issues/programs/ewrims/), population and demographic data from IPUMS Microdata samples[55], infrastructure scenarios from consulting reports[45] and Urban Water Management Plans[46] (https://wuedata.water.ca.gov/).

Code availability

The relevant code used for water system simulation and bill calculation is available from the corresponding author upon request.

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Subject: RE: Sites Admin Final EIS/EIR Review Briefing
Attachments: 202301_Admin Final EIR_EIS Review Prep_Final_V2.pdf

Hi All,

Here are the slides from yesterday's briefing on the Sites Admin Final EIS/EIR. Let me know if you don't see a link to the files by the end of the day tomorrow.

Thank you,

Allison Jacobson

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Subject: Sites Admin Final EIS/EIR Review Briefing

Hi All,

Thank you for attending the briefing on the Sites Admin Final EIS/EIR. If you missed the briefing, had to step away, or would like to hear the presentation again, there is another meeting scheduled for 2/1 at 3 PM.

Let me know if you'd like me to add you to the 2/1 briefing.

Thank you,

Allison Jacobson

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Sites Reservoir Project
Administrative Final EIR/EIS

January 2023

Sites

1

Agenda

- Purpose of Meeting
  - Provide overview of the Administrative Final EIR/EIS and the review process and schedule
- Approach to the Final EIR/EIS:
  - Final EIR/EIS Development
  - Content and Format
  - Approach to Responses to Comments
- Project Refinements:
  - Preferred Alternative
  - Comparison of RDEIR/SDEIS and Final EIR/EIS Operational Criteria
  - Mitigation Measure Fish-2.1
  - Updated Modeling
  - Facility Refinements
- Review Process and Schedule

Draft - Professional Working Document - For Discussion Purposes Only 2

2

Approach to Final EIR/EIS

Sites

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Final EIR/EIS Development

- RDEIR/SDEIS released November 12, 2021
- Close of public review January 28, 2022
  - 101 comment letters
  - Some comments submitted in form letters and in a petition
  - Approximately 1,000 individual comments
- Efforts since RDEIR/SDEIS:
  - Identification of refinements to the Project, both facilities and operations
  - Revisions to diversion criteria and associated modeling
  - Developed master and individual responses to comments
  - Revisions to EIR/EIS text based on comment/responses and/or based on project modifications (e.g., facility changes, operation modifications)

4

Final EIR/EIS Format

- Volume 1 – Chapters
  - Include all chapters from RDEIR/SDEIS *with changes*
- Volume 2 – Appendices
  - Include all appendices from RDEIR/SDEIS *with changes*
- Chapters and appendices without changes are not included
- Changes shown as
  - Admin Final – Changes shown in track changes
  - Final EIR/EIS – Changes shown as margin line only

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Final EIR/EIS Format (continued)

- Volume 3 – Response to Comments
  - Chapter 1 – Introduction and Approach
  - Chapter 2 – Commenter Indices and Form Letter Introduction
  - Chapter 3 – Master Responses Introduction and Master Responses
  - Chapter 4 – Responses to Comments Tables
  - Appendix – Response to 2017 Comments required by NEPA

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General Approach To Responding to Comments

- Master Responses
  - Identified common themes and comments in order to draft Master Responses
- Individual Responses
  - Prepared responses to all individual comments
  - Currently organized by topics in comment response tables
  - Individual comments and responses will be reorganized **by letter** prior to publication of the Final EIR/EIS

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Master Response Topics

- MR1, CEQA and NEPA Process, Regulatory Requirements, and General Comments
- MR2, Alternatives Description and Baseline
- MR3, Hydrology and Hydrologic Modeling
- MR4, Water Quality
- MR5, Aquatic Biological Resources
- MR6, Vegetation, Wetland, and Wildlife Resources
- MR7, Tribal Coordination, Consultation, and Engagement
- MR8, Trinity River
- MR9, Alternatives Development

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Chapters/Appendices with No Changes

- Chapters
  - 13, Minerals
  - 18, Navigation, Transportation and Traffic
  - 19, Noise
  - 20, Air Quality
  - 22, Cultural Resources
  - 24, Visual Resources
  - 25, Population and Housing
- Appendix 8B, 9A, 9B, 10A, 10B, 19A, 20A, 20C, 20C1, 20C2, 20C3, 20D, 22A, 24A, 24B, 33C

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Project Refinements

Sites

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Key Differences

- Changes between RDEIR/SDEIS and Final EIR/EIS:
  - Preferred Alternative is now Alternative 3
  - Revisions to diversion criteria
  - Incorporation of Mitigation Measure Fish-2.1 into Project
  - Revised modeling
  - Minor changes in facilities due to design refinements
  - Corrections or clarifications needed in response to comments
- No new or substantial greater impacts identified that would require recirculation

Changed to Alt 3 as Preferred Alternative

Facilities / Operations	Alternative 1 – Authority's Preferred Project in RDEIR/SDEIS	Alternative 2	Alternative 3 – Preferred Alt in the Final EIR/EIS
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 1
Reclamation Involvement	1. Funding Partner, up to 7% 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
DWR Involvement	Operational Exchanges with Oroville and storage in SWP facilities South-of-Delta	Same as Alt 1	Same as Alt 1
Route to West Side of Reservoir	Bridge across reservoir	Paved road around southern end of reservoir	Same as Alt 1

Revised Diversion Criteria

Location (Listed from North to South)	RDEIR/SDEIS with Mitigation Included	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 are 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, (2) hourly gage monitoring at Bend Bridge gage detects the predicted flow of 8,000 cfs, and migrating anadromous fish are detected at RBDD, and (3) pulse protection may cease earlier than 7 days if flows at Bend Bridge exceed 25,000 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

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Revised Diversion Criteria (Continued)

Location (Listed from North to South)	RDEIR/SDEIS with Mitigation Included	Final EIR/EIS
Minimum Bypass Flows in the Sacramento River at Wilkins Slough	Chapter 2: In addition to the minimum bypass flows in the Sacramento River at RBPP and the Hamilton City Pump Station, a minimum bypass flow of 8,000 cfs in the Sacramento River at Wilkins Slough would be in place in April and May and 5,000 cfs during the rest of the year Mitigation Measure FISH-2.1: 10,700 cfs in March through May; 5,000 cfs all other times	10,700 cfs October 1 through June 14; 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 is 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

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Revised Diversion Criteria (Continued)

Location (Listed from North to South)	RDEIR/SDEIS with Mitigation Included	Final EIR/EIS
Sacramento River Fully Appropriated Stream	Diversions allowed only when the Sacramento River is not fully appropriated (September 1 through June 14)	No change
Excess conditions, as determined by DWR and Reclamation and defined in 2018 COA Addendum	Delta must be in excess for Sites Reservoir diversions	No change
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

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Incorporation of Mitigation Measure Fish-2.1 into Project

- RDEIR/SDEIS
  - Included Mitigation Measure FISH-2.1 to reduce potential life stage effects on salmonids by increasing the bypass flow requirement at Wilkins Slough
    - Minimum bypass flow requirement of 10,700 cfs at Wilkins Slough in March-May
- Final EIR/EIS
  - Project description now incorporates the requirements of Mitigation Measure FISH-2.1, which have been refined and made more restrictive (the revised diversion criteria on the previous slide)
  - The bypass flow requirement at Wilkins Slough has been developed as an integral component of how the Project is proposed to operate in terms of its water diversion criteria
  - The modeling performed for the Final EIR/EIS includes the revised diversion criteria
  - This eliminates the need for Mitigation Measure FISH-2.1 in the Final EIR/EIS

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Revised Modeling

- Adjustments made in the CALSIM II modeling between the RDEIR/SDEIS and the Final EIR/EIS to better represent the most up-to-date modeling procedures and actual operations, including:
  - Shasta Lake Operations – expanded exchanges to include more opportunities for fall flow stability and spring pulse enhancement
  - Deadpool Volume – reduced from generally 120 TAF to 60 TAF
  - Delta Salinity Accounting – slightly refined based on revisions to Calsim II coding
  - Period of Diversion to Sites Storage – revised to only include Sept 1 to June 14 to match water right application
  - South of Delta Water Delivery – revised to allow in any year that capacity is available (previously limited to below normal, dry and critically dry years)
  - Updates to Diversion Criteria – revised diversion criteria incorporated

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Facility Refinements

- The RDEIR/SDEIS noted that:
  - "Preliminary design for facilities described herein will continue to be refined and modifications may occur as needed as the Project proceeds to final design and as part of the ongoing value engineering process undertaken by the Authority."
- Admin Final EIR/EIS includes:
  - Sloped rather than vertical Inlet/Outlet (I/O) Tower
  - Single 32' diameter I/O tunnel replaces two 23' tunnels
  - Removal of two emergency release structures, eliminating emergency drawdown releases to Hunters Creek

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Review Process and Schedule

Sites

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Review Process and Schedule

- Starting February 1 files will be available for online review
  - Email will be sent with link to everyone invited to these meetings
- Additional files added as they are ready with all files posted by February 10
  - Additional emails sent as new files are uploaded
- Final editing and formatting not finished – its good but still working on great!
  - Focus comments on substantive issues
  - We appreciate pointing out number inconsistencies
  - Don't bother to comment on edits and format
- All comments due by February 28

Draft - Professional Working Document - For Discussion Purposes Only

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Format for Comments

- Please provide comments in comment bubbles
- Prefer no track change edits but recommended text changes can be added in bubbles
- Prefer comments all on SharePoint so everyone can see each others comments
- If you copy/download a file for your internal agency review, please upload back onto SharePoint with your agency name on the end
  - 01_ExecutiveSummary_Sites
- Each person accessing SharePoint needs “individual” access

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Where To Go With Questions

- File access issues/challenges
  - Laurie Warner Herson at laurie.warner.herson@phenixenv.com
- CEQA Responsible Agencies
  - Ali Forsythe at aforsythe@sitesproject.org
  - Laurie Warner Herson
- Reclamation staff and NEPA Cooperating Agencies
  - David Brick at dbrick@usbr.gov
  - Allison Jacobson at ajacobson@usbr.gov

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Questions?

Sites

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Sites

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From: Janis Offermann [janis@horizonh2o.com]
Sent: 1/31/2023 12:13:27 PM
To: charlie.wright@kdwn.org
CC: Kevin Spesert [kspesert@sitesproject.org]
Subject: Sites Reservoir Tribal Working Group
Attachments: 20230112_TWG Notificaiton Letter_Formatted_CortinaIndianRanchera_Wright.docx

Hello, Chairperson Wright
On behalf of the Sites Project Authority (Authority), I just left a voice message on your tribal administration office phone and am following up with this email.

The Authority would like to invite you to participate in a Tribal Working Group (TWG), as described in the attached letter, which was also forwarded to you via the U.S. mail. The intent of the TWG is to provide a forum for local tribes to discuss concerns you might have about the proposed Sites Project and to help craft solutions to those issues, as well as to provide input on such topics as recreation opportunities and biological mitigation.

We hope you will consider this invitation and join us in the TWG.
Please feel free to contact me via email or at the phone number listed below if you have any questions. You may also contact Kevin Spesert, the Authority's External Affairs Manager, who is cc'd here, at kspesert@sitesproject.org or (530) 632-4071.

We look forward to hearing from you soon.
Sincerely,

janis

Janis Offermann, MA, RPA
Cultural Resources Practice Lead
Horizon Water and Environment
1801 7th Street, Suite 100
Sacramento, CA 95811
530.220.4918

January 12, 2023

Cortina Indian Rancheria of Wintun Indians
Mr. Charlie Wright, Chair
P.O. Box 1630
Williams, CA 95987

Subject: Invitation to Participate in a Tribal Working Group; Sites Reservoir Project in Glenn, Colusa, Tehama, and Yolo Counties, California

Dear Honorable Chairperson Wright:

The Sites Project Authority has periodically reached out to you over the past several years to provide you information about the progress of the Sites Reservoir Project (Proposed Project or Project), and to invite you to consult on the Project under Assembly Bill 52 (AB 52), pursuant to Public Resources Code § 21080.3.1, as a tribe with a traditional and cultural affiliation with the Proposed Project area. We understand that not all tribes have the availability to consult under AB 52, but we continue to value your input on the Proposed Project. To this end, we are inviting you to participate in a Tribal Working Group (TWG) to address topics of concern and interest to tribes who have a traditional and cultural affiliation with the Proposed Project area.

We envision the TWG to include only those tribes with a direct ancestral relationship with the Project area: Cachil Dehe Band of Wintun Indians; Kletsel Dehe Wintun Nation; Yocha Dehe Wintun Nation; Grindstone Indian Rancheria of Wintun-Wailaki Indians; and Paskenta Band of Nomlaki Indians. The TWG would be organized and facilitated by Ali Forsythe, the Authority's Environmental Planning and Permitting Manager, and Kevin Spesert, the Authority's External Affairs Manager, along with the Authority's consultant team currently working with Yocha Dehe under AB 52. To facilitate communication within the Authority, a member of the Sites Reservoir Board of Directors and a Sites Reservoir Committee would be invited to attend meetings.

The need for confidentiality regarding information shared about sensitive topics is fully acknowledged and understood by the Authority which is one of the reasons we propose the meetings be held by invitational only. It is anticipated that sensitive topics, such as tribal cultural resources, would only be addressed at a very general level within the TWG. It is understood that individual tribes may not wish to share some information with their neighboring tribes and that such discussions would be managed appropriately and respectfully.

P.O. Box 517
Maxwell, CA 95955
530.438.2309

Sites

It is expected that the first meeting would be held in February 2023 with an expected frequency of bi-monthly. This meeting would be introductory, be about 2 hours and would provide a status update about the Proposed Project and a discussion with participants about administrative items such as meeting schedule and time, holding in-person or virtual meetings, and agreeing on goals and objectives for the group through mutual development of a TWG chartering document. The Authority will staff and pay for the meeting facilitation and provide all of the technical support needed for the meetings. Subsequent meetings would address topics generated by the interests of the TWG members. To kickstart the process, we have considered the following as potential topics for discussion:

- Workforce development including jobs for Tribal members during construction and implementation of the Project;
- Discussing any Tribal member concerns with local transportation impacts that might be associated with construction of the Project;
- Tribal interests in the recreational areas and amenities planned for the Project;
- Tribal interests in the biological mitigation sites to be developed as part of the project, including use of Tribal Ecological Knowledge; and
- Tribal interests in stewardship and future access to Project lands and resources that are not otherwise used for Project activities.

We anticipate that there will be other topics that you will want to address and are open to discussing topics of interest to the TWG members.

We hope that you will accept this invitation to be part of the TWG and help us better understand the challenges and concerns of the local Native American community relative to the Proposed Project, as well as explore opportunities to productively address these same issues. Both Ali and Kevin (mentioned above) are available if you have any questions about the TWG. Ali can be reached at aforsythe@sitesproject.org or (916) 880-0676 , and Kevin at kspesert@sitesproject.org or (530) 632-4071. One of them will be contacting you directly in the upcoming weeks to further discuss formation of the TWG.

Sincerely,

Fritz Durst

Fritz Durst
Chair

Sites Reservoir Project
CP-1 Schedule Discussion

February 1, 2023

Objective

- Currently, substantial completion is end of 2036
- Observed some assumptions and constraints that need to be reexamined
- There are big time gaps in the schedule that need to be examined
- Discuss opportunities to move up this substantial completion date

Real Estate & Permitting - Assumptions & Constraints

- This task group generally precedes and controls design and construction.
- EIR is basis for permitting, environmental, geotechnical investigations.
- Preconstruction Avoidance controls (and is predecessor for) start of construction in Sept. 2031.

Design & Construction – Assumptions & Constraints

- Sequencing of activities to 60% design: Critical Land Access => P2a/P2b Geotechnical Investigations => 60% Design
- DSOD reviews/approvals:
  - 6 months each for 30, 60, 90% reviews; design continues during DSOD reviews.
  - 3 months for 100% review and approval.
  - Assumes ~quarterly update meetings with DSOD.
- Construction productivities & durations - based on past experience on similar projects.
- In general, productions and durations are calculated on 10-hour work shifts, 90% efficiency, 5 days per week.
- Dam excavation, placement of dam embankments, and tunnel excavation/ support, are scheduled as double shift work as needed to maintain critical path, for logistics reasons, and weather make-up.

Overview of CP-1 Schedule - Key Tasks

ID	Task Title	Duration	Start	Finish
5	CWC Award of Funds	0	12/1/2023	12/1/2023
6	Sites Board Approval/NTP for Final Design	23 days	12/1/2023	1/2/2024
12	Authority Approval to Proceed/P2 Access (NTP)	0	1/3/2024	1/3/2024
16,17,18	Critical Land Access, P2a/P2b, Geotech Investigation	200 days	1/3/2024	10/8/2024
82,83,84	P2a/P2b Geotech Investigation	76 wks	10/9/2024	3/24/2026
92,103,115	GG Dam 60% Design (1)	39 wks	3/25/2026	9/22/2026
98,109,121	GG Dam DSOD Approval Received (Embankment)	0	8/8/2028	**8/8/2028**
30	Permitting	1429 days	3/25/2026	9/15/2031
71	Precon Avoidance	30 days	**8/5/2031**	9/15/2031
182	Northern Const Access Roads	284 days	**9/16/2031**	10/15/2032
319	GG Dam Construction	990 days	10/18/2032	8/1/2036
344	Substantial Completion	0	12/5/2036	12/5/2036
Notes:				
(1)	Followed by 90%, 100% designs. GG Dam Foundation 60% Design finish is 9/22/26			

Opportunities to Move Up Substantial Completion - Engineering

- Can Preconstruction Avoidance be moved up - to start construction earlier?
  - Can localized areas be advanced?
- Can 60% geotechnical data be expedited for critical features like Roads, Golden Gate and Sites Dams so that design could be started/completed sooner?
  - Construction would also need to start earlier to move up schedule (first bullet)
- Evaluate if all access roads are needed to construct Golden Gate Dam.
- We will reevaluate if engineering tasks can be expedited.
  - Instead of 30/60/90/100% submittal stages, confirm with DSOD if 30/~75/100% would be acceptable
  - Look for others potential opportunities

From: Micko, Steve [Steve.Micko@jacobs.com]
Sent: 1/31/2023 12:44:27 PM
To: Alicia Forsythe [aforsythe@sitesproject.org]; Angela Bezzone [bezzone@mbkengineers.com]
CC: Leaf, Rob [Rob.Leaf@jacobs.com]; Thayer, Reed [Reed.Thayer@jacobs.com]; Whittington, Chad [Chad.Whittington@jacobs.com]
Subject: Sites Recent Year Fill And Release
Attachments: Sites_Project_2009-2022_Fill_Release_Storage_Estimates_Documentation_20230130_v1.docx

Hi Ali and Angela,

As noted during our Friday coordination call, we estimate that Sites would have 140 TAF in storage at the end of September in 2022.
The attached memo documents assumptions and presents results.

Please let us know if you have any questions.

Thanks,
Steve

Steve Micko, PE (he/him) | Jacobs | Project Manager and Water Group Leader
O:916.286.0358 | M:408.834.6614 | Steve.Micko@jacobs.com
2485 Natomas Park Drive Suite 600 | Sacramento, CA 95833

Sites Project Annual Fill, Release, and Storage Estimates for Water Years 2009 – 2022

Overview

A simple analysis to estimate annual Sites diversion, release, and storage values for Water Years (WY) 2009 – 2022 was conducted using correlations between modeled results and historic information and annual mass balance calculations. Fill values were estimated using the Daily Divertible & Storable Flow Tool's simulation of Final EIR/EIS Alternative 3 and historical flow information at Bend Bridge. Releases were estimated based on the correlation between CalSim II simulated releases and the historic Sacramento Valley Water Supply Index (WSI HIST). This approach was used to evaluate potential Sites Project operations for recent years that are not covered by the CalSim II simulation period.

Assumptions and Analysis Performed

Sites fills, releases, and end-of-September storage conditions were computed in a spreadsheet using simple mass balance calculations, the Daily Divertible & Storable Flow Tool, and historical information. The analysis included operational assumptions and conveyance constraints consistent with Final EIR/EIS Alternative 3.

Sites Storage

The starting storage for WY 2009 was assumed as 600 TAF based on an analysis of Sites operations for WY 1922 – 2008 using the Sites fill "regression method" and Sites release function that are described in the following sections. The analysis showed that Sites Reservoir would fill to near capacity after the above normal and wet years of 2005 and 2006. Then, in the drier years of 2007 and 2008, a high level of Sites releases would bring storage down to almost 600 TAF. For the analysis of WY 2009 – 2022, the starting storage only influences storage conditions and releases through the end of WY 2013, when deadpool storage is reached regardless of the storage volume in WY 2009. Fills and releases were constrained by available storage. The physical storage capacity of Alternative 3 is 1.5 MAF. Evaporation was estimated using a rating curve between storage and evaporation developed for the CalSim II simulation of Alternative 3 for WY 1922 – 2003.

Sites Fill

Daily Divertible Flow Tool (DDFT) (WY 2009 – 2018)

For WY 2009 – 2018, the annual diversions to fill Sites Reservoir were determined by the Daily Divertible & Storable Flow Tool's simulation of Alternative 3. The Daily Divertible Flow Tool (DDFT) estimates the daily diversion potential for Sites Project in WY 2009 – 2018 based on water availability and intake/conveyance constraints and diversion criteria. Development of the DDFT began in 2018 to supplement CalSim II by representing the effects of operations criteria on a daily timestep, allow for relative comparisons between monthly and daily approaches, and provide results for more recent years. The DDFT simulates each year as a separate event and does not include storage or release operations.

Regression Method (WY 2019 – 2022)

The DDFT does not simulate results for 2019 – 2022. Fills for these years were estimated based on a regression between historical full natural flows for the Sacramento River at Bend Bridge (CDEC; SBB FNF) and CalSim II results for diversions to fill Sites Project under Alternative 3. It was determined that Sites diversions were typically about 9% of the November through March volume of full natural flow at Bend Bridge when it was greater than 1,150 TAF. When the November through March volume of full natural flow at Bend Bridge was less than 1,150 TAF, Sites diversions were typically zero. A function was established to reflect these observations in the estimates of Sites fills for WY 2019 – 2022. Figure 1 shows the correlation between SBB FNF and Sites diversions using CalSim results and the extrapolation method used by the Sites Fill Function from WY 1922 – 2003.

Sites Fill Function:

- For WY 2009 – 2018:
    - Sites fills are equal to Alternative 3 results from the DDFT.
- For WY 2019 – 2022:
    - Sites fills are equal to 9% of the November through March volume of full natural flow of the Sacramento River at Bend Bridge (SBB FNF; CDEC).
        - When SBB FNF (Nov-Mar) is less than 1,150 TAF for a given year, Sites fills is zero

- Sites fills are also constrained by available storage capacity based on annual mass balance calculations.

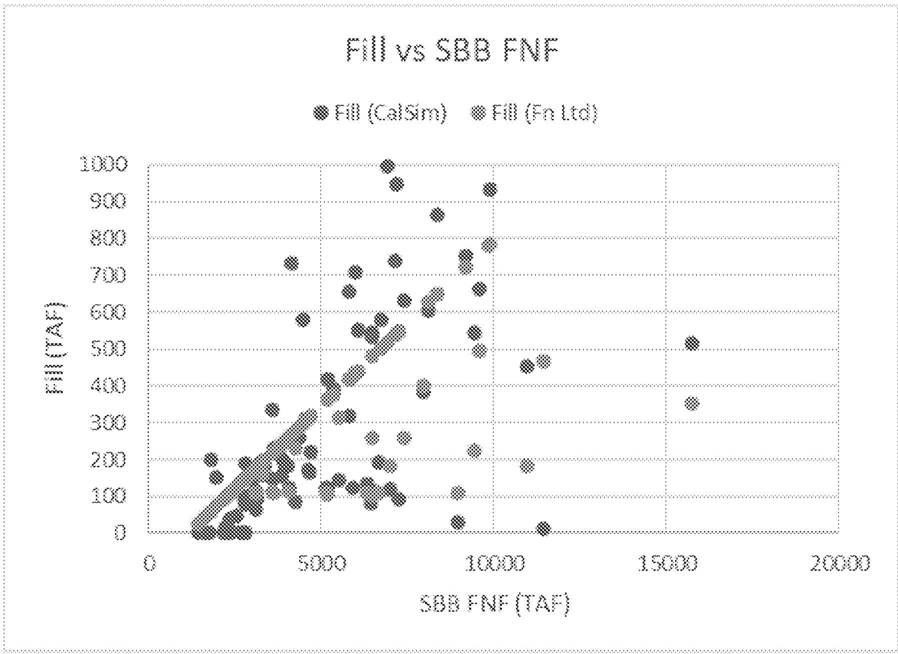

Figure 1. Sites Fill vs SBB FNF correlation between CalSim II and Fill Function results.

Sites Release

Sites releases were estimates based on a "similar years" relationship developed from CalSim II results for total releases from Sites Project under Alternative 3 using the historical Sacramento Valley Water Supply Index (WSI HIST) as an indicator of wetness. A release function was developed by evaluating the correlation between CalSim II simulated releases and the WSI HIST from WY 1922 – 2003. Figure 2 shows the correlation between the Sacramento Valley WSI and Sites release using CalSim II results and the release function described below.

- For WSI HIST < 7.25:
    - Release = 180 TAF per WSI unit below 8.5
- For 7.25 < WSI HIST < 9.75:
    - Release = 60 TAF per WSI unit below 11.0
- For WSI HIST > 9.75:

- Release = 75 TAF
- Releases may not exceed storage availability based on annual mass balance calculations (previous year's storage plus the current year's fill minus dead pool storage).

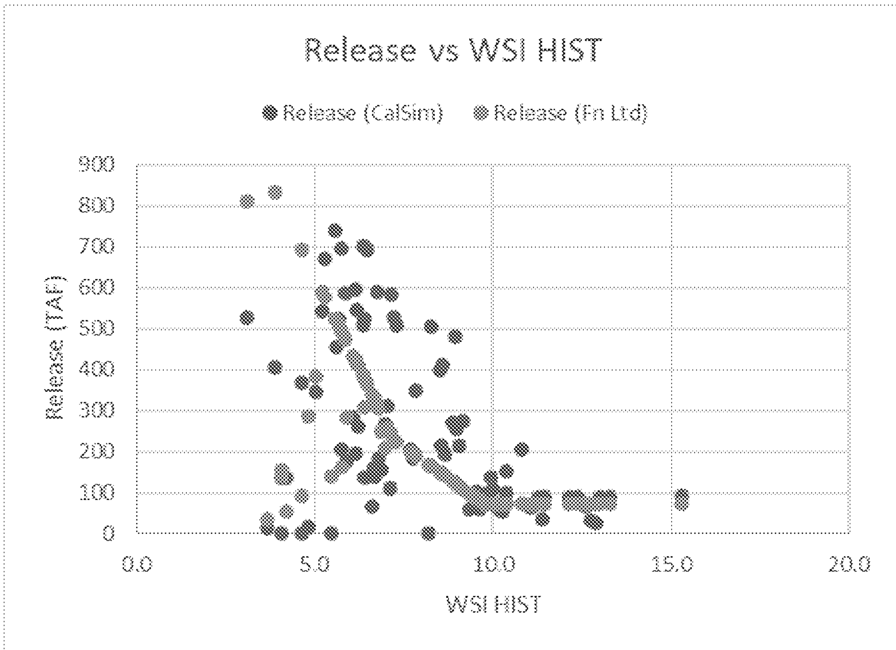

Figure 2. Sites Release vs WSI HIST correlation between CalSim and Release Function results.

Results

Table 1 shows the annual estimates for Sites fills, releases, and end-of-September (EOS) storages for Alternative 3 using the approach described above. In this 14-year period, the estimated average annual fill and release values are 253 TAF and 222 TAF respectively. The estimated average end-of-September storage in Sites Reservoir is 433 TAF. These results reflect Sites operations during a relatively dry period, with 7 out of the 14 years being classified as dry or critically dry years. Despite the dry conditions, the tool estimates that Sites Reservoir would have exceeded 1 MAF in WY 2019, after only a couple of wet years. The fills in wet years allow for releases during drier years. As illustrated by Figure 3, estimated Sites releases typically are highest during drier years when sufficient storage is available. For example, Sites Reservoir released 430 TAF in the dry year of 2020 while still maintaining 740 TAF in storage. In the critically dry year of 2021, Sites Reservoir released 680 TAF to support the drought conditions.

Table 1. Annual Sites Fills, Releases, and End-Of-September Storage for Alternative 3 (TAF).

Water Year	Year Type	Diversions to Fill Sites	Total Sites Releases	Total Sites Storage (EOS)
2009	D	110	490	190
2010	BN	250	260	160
2011	W	650	80	720
2012	BN	20	290	430
2013	D	140	480	60
2014	C	0	0	40
2015	C	10	0	40
2016	BN	240	230	50
2017	W	990	80	960
2018	BN	30	240	720
2019	W	480	80	1,090
2020	D	110	430	740
2021	C	60	680	90
2022	C	110	30	140
Average		253	222	433

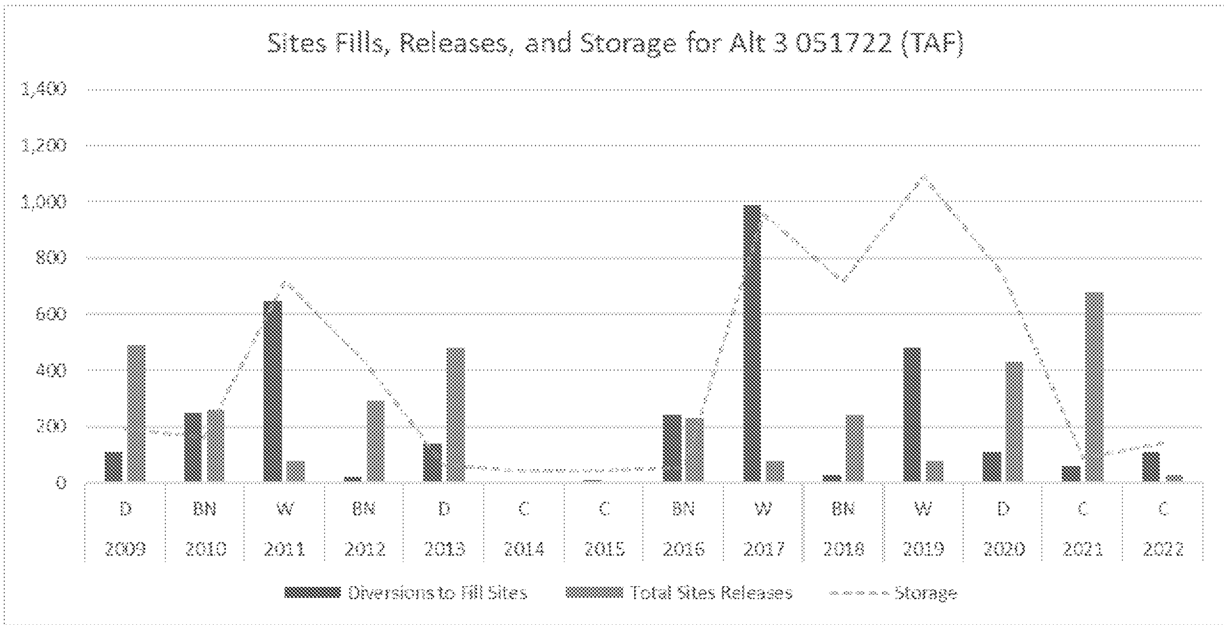

Figure 3. Sites Fills, Releases, and End-Of-September Storage for Alternative 3 (TAF).