

San Joaquin River Restoration Program



Water Management Technical Feedback Meeting

Visalia, CA

October 26, 2018



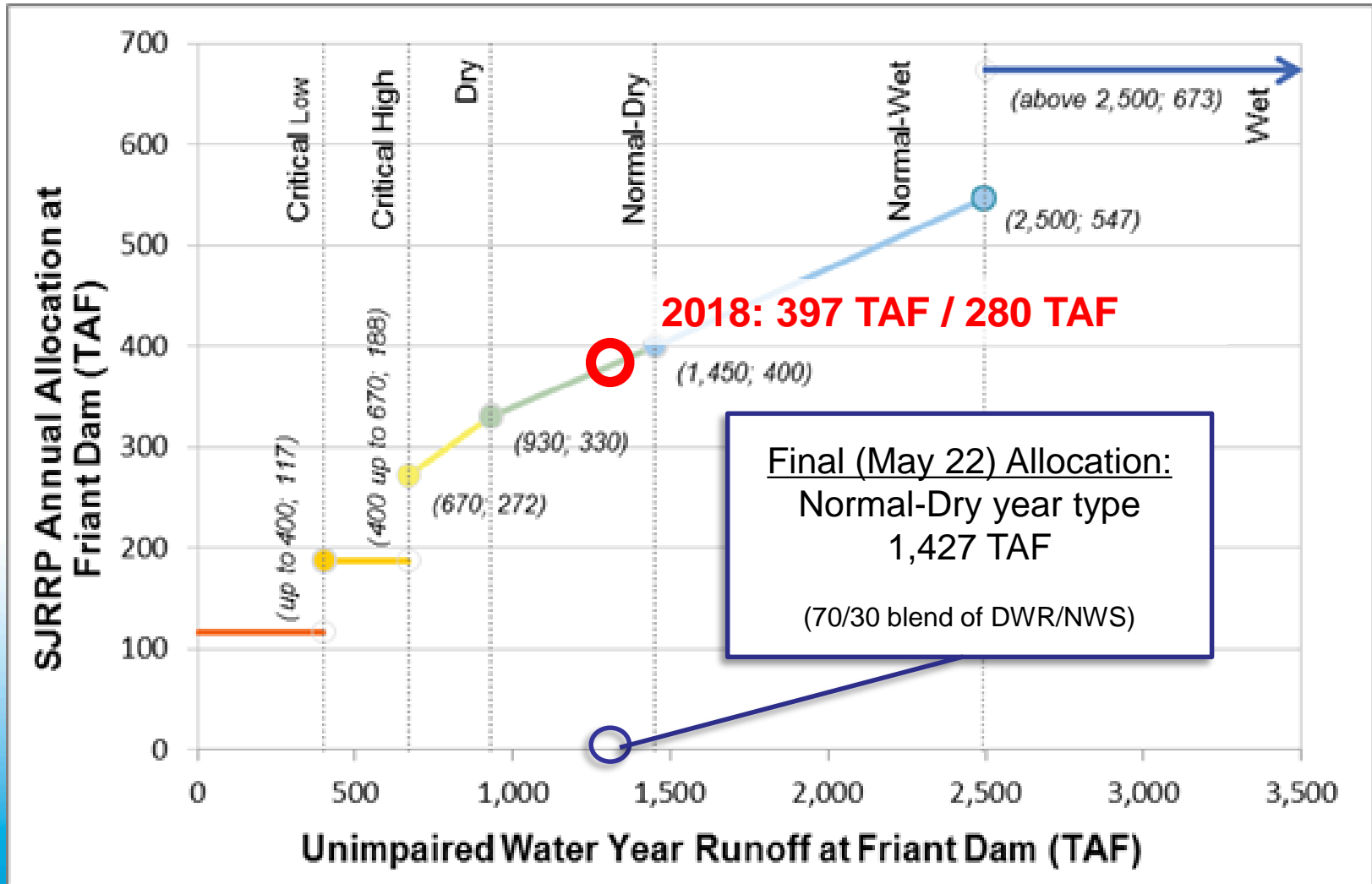
Agenda

- Introductions
- 2018 Operations
- 2019 Outlook
- URF Reconciliation Discussion
- WMG Guidelines, Plans and Project Updates
- Friant Surcharge Discussion
- Break
- Lecture Series – SJRRP On-River Const. Proj.
- Future Meetings/Stakeholder Feedback
- Adjourn



2018 OPERATIONS

2018 Restoration Year Type



2018 Allocation Summary

Date	Blending (forecast exceedance)	Forecast Natural River	WY Type	Allocation at GRF
Jan 23	20/80 (75%)	741 TAF	Dry	171.178 TAF
Feb 16	30/70 (90%)	525 TAF	Critical-High	70.919 TAF
Mar 16	40/60 (75%)	928 TAF	Dry	212.908 TAF
Mar 29	50/50 (50%)	1372 TAF	Normal-Dry	272.855 TAF
May 22	70/30 (50%)	1427 TAF	Normal-Dry	280.258 TAF

- Uncontrolled Season from April 10-May 10
- Water Supply Test applied based on forecast at end of UcS
- No updates were made to allocation afterwards
 - Increases would result in more water being sold to Class 1 under WST
 - Decreases would result in unwinding part of the 51 TAF of URFs sold to Class 1 for \$50.
 - Final WY 1349 TAF



2018 Joint Forecasting

Efforts and achievements

- Met weekly January through June
- 4 staff assisting C. Moore and R. Gonzalez:
- Regular communication with iSnobal team in Boise
- Gaining confidence in CU Boulder satellite snowpack model reports
- Better understanding of meteorology stations in the watershed
- Streamlined the forecast blending process



2018 Joint Forecasting

Lessons Learned

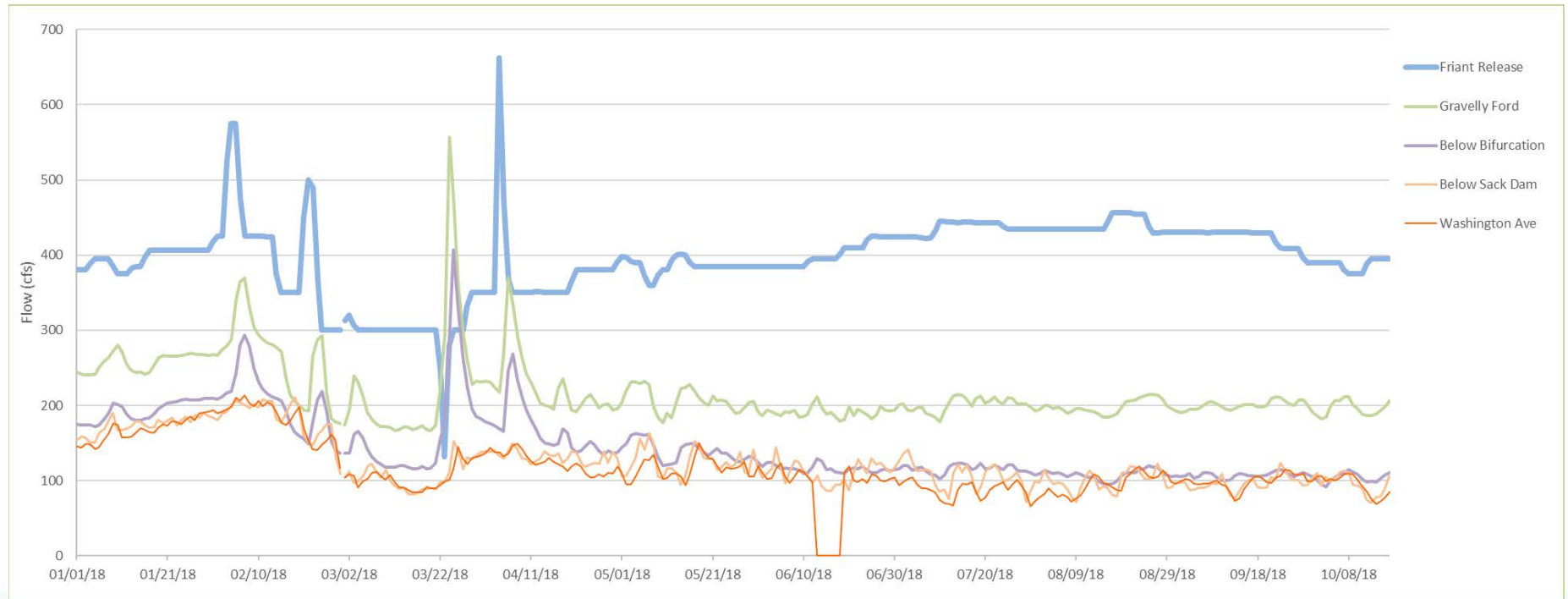
- High rain-snow level this winter resulted in poor monitoring of rainfall and snowpack
 - Some snow pillows performed poorly
 - Tipping bucket rain gauges performed poorly
 - Rain isn't captured well by snow pillows
- Substantial disagreement between models, ASO data is important for converging models
- 2 ASO flights after peak snowpack is not enough
- Much work remains on understanding runoff processes (soil moisture, water in transit, % yield)
- SOPs are needed for joint forecasting process



2018 RA Objectives

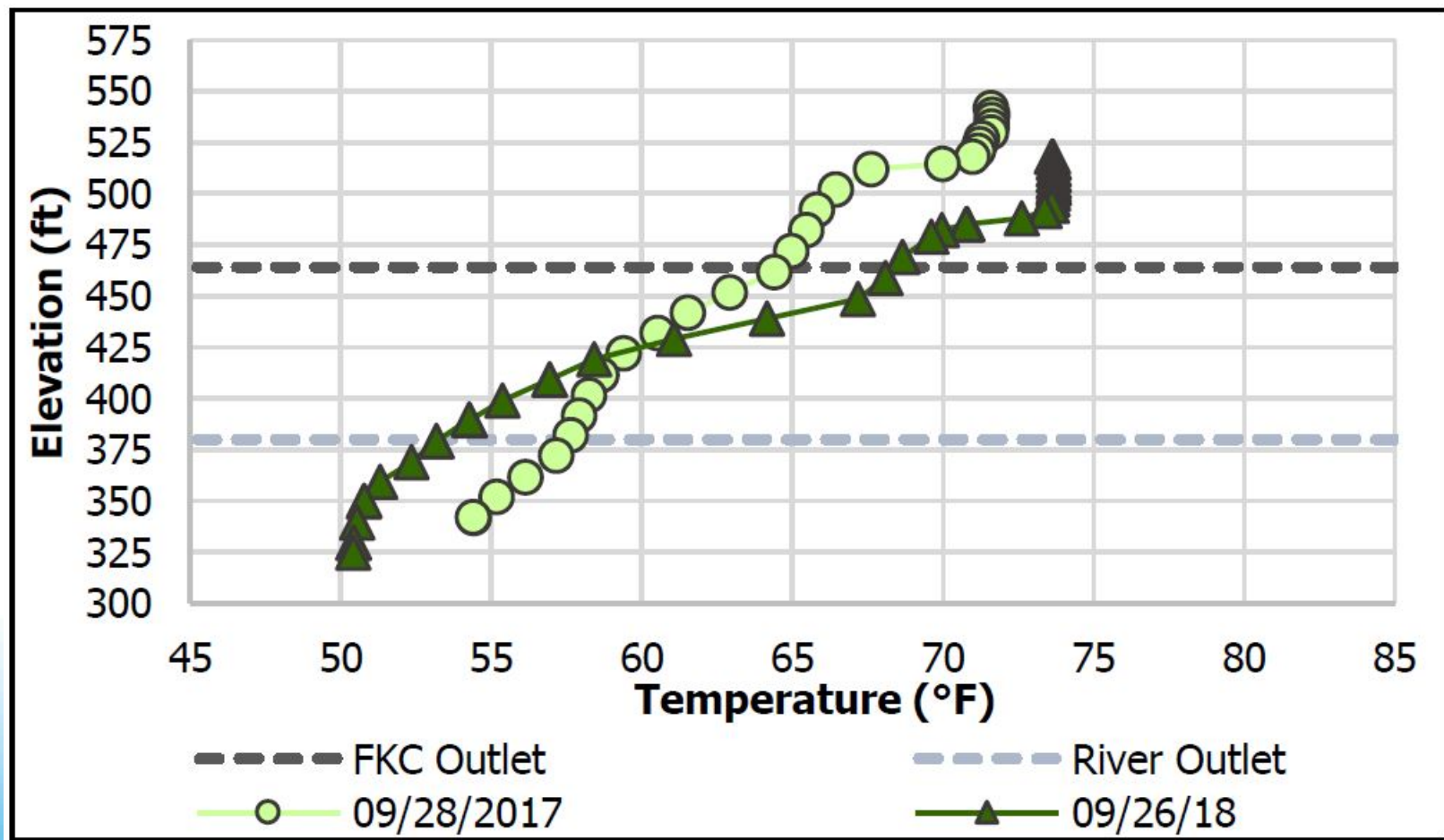
- Maintain a connected river
- Continue spring-run Chinook release of tagged adult brood stock (repeat of 2017)
- Experience shaping pulse flows, transmitting downriver, and monitoring fish response
- Manage Millerton Cold Pool
- Minimize Mendota Pool recapture (if it can't be released through all points, sell URFs at Millerton)

2018 River Releases



- Gravelly Ford baseflows varied between 185 and 220 cfs since April
- Two pulse flows in February, one in April
- Tributary flows in March

2018 River Temperatures



- River Outlet temps were 4.5° F cooler in Sept 2018 as compared to Sept 2017

Unreleased Restoration Flows

URF Sales

Date	Tier	Price	Volume (AF)	Allocation
April 6	Tier 1 / Block 1 (deliver by 4/30)	\$20	38,000 net at turnout	Class 2
May 16	For Water Supply Test*	\$50	50,993 net at turnout	Class 1
June 26	Tier 2 / Block 3	\$256	10,993	Class 1

* As a result of Water Supply Test compensation. Offsets RWA credit.



Water Supply Test

- Settlement requires a Water Supply Test when Exhibit B 4(d) is invoked to avoid delivery reductions to Friant beyond Exhibit B
- Because of proposed RA shift of spring water to summer (river releases and URF sales), this action resulted in UcS being extended in time and volume
- Water Supply Test was applied retrospectively, and resulted in 51 TAF of URF being sold to Class 1 at approx Class 1 rates - Impact mitigated.
- Future application of WST will not be retrospective, it will be forward looking

Unreleased Restoration Flows

URF Exchanges

- Additional water was added to existing 2016 URF Exchange Agreements

Partner	Volume (AF)	Return	Terms
OCID	1,000	Variable	Returns depend on Class 1 declaration
FID	4,000	4:1	
AEWSD	7,000	1:1	Additional URF sales required to satisfy exchange

- An additional 2,366 AF was sold to DEID to satisfy 2017 exchange, and 4,199 AF to AEWSD to partially satisfy 2016 exchange

Unreleased Restoration Flows

URF Revenue

- Summary of URF Revenue from Sales and Exchanges

URF Type	Net Volume (AF)*	Revenue
Sales	85,586	\$6,123,858
Exchanges (priority sales)	6,565	\$494,505
Total	92,151	\$6,618,362

* Net URF volume is 95% of Gross URF volume in Millerton due to canal losses



Moving Fall Pulse

- New RA Flow Schedule (issued late October 2018) proposes moving fall pulse from November to February (no fall-run salmon in Restoration Area)
- This is a “transfer” from one flow period to another, requiring a Water Supply Test
- Millerton Ops Spreadsheet will be used to compare reservoir storage levels

Recapture & Recirculation

Recapture History

Month	Mendota Pool Recap (AF)	Lower SJR Potential Recap (AF)	Lower SJR Actual Recap (AF)	Total Recap (AF)
March	552	3,425	3,130	3,682
April	1,114	4,275	4,200	5,314
May	0	3,964	3,900	3,900
June	0	2,637	2,699	2,699
July	0	2,697	1,503	1,503
August	0	3,015	2,650	2,650
September	0	2,966	2,850	2,850
TOTALS	1,666	22,979	20,932	22,598

Recapture & Recirculation

Recapture Forecast

Month	Mendota Pool Recap (AF)	Lower SJR Potential Recap (AF)	Lower SJR Actual Recap (AF)	Total Recap (AF)
October	0	3,225	~ 3,200	~3,200
November	0	4,750		
December	0	5,250		
January	0	6,150		
February	0	11,100		
TOTALS	0	30,475	—	—

- PID will be offline for maintenance in November 2018
- February potential recapture is speculative



2018 Seepage

- Reach 4A
 - One key limitation at ~150 cfs lifted due to seepage easement execution
 - Another limitation at ~150 cfs to be lifted any day now
 - Next limitation being analyzed (300-500 cfs)
- Reach 3
 - One key limitation at ~700 cfs (Arroyo Canal plus Restoration Flows) likely to be in effect for a year or more



Other Operational Issues

These are in addition to RFG efforts

- Mendota Pool Recapture Accounting
 - SJREC use “orders” not “actual” flows
 - Reclamation typically uses “actual” flow numbers
 - Different accounting systems causes problems when we recapture at Mendota Pool
- Sack Dam Compliance
 - Summer 2018 operations have been +/- 25 cfs
 - Difficulty in holding stable summer flows
 - Need expectations, consequences for over/under release at Sack Dam – current discussion topic



Other Operational Issues

- Unexpected Seepage Losses
 - Reach 1 analysis by CDM Smith in preparation
 - Reach 2B analysis by SJRRP near completion
 - Other reaches pending
 - Combined efforts of Settling Parties and SJREC may be needed to address diversion (Paragraph 13f)



2019 OUTLOOK



2019 Outlook

Expecting improved channel capacity

- ~ 500 cfs Restoration Flow limit in winter and ~150 cfs Restoration Flow limit in summer (at GRF)
- Fewer URFs due to improved channel capacity

Expecting RA to shift 10-15 TAF of spring period flows to summer period:

- To keep river connected in Summer
- Accommodate Sack Dam release variability
- Improve river temperatures
- Will be subject to Water Supply Test
- Possibly enabled by URF Exchange



2019 URF Sales

- No significant changes
- Combined Sales/Exchange agreements being circulated now
- Proposal to implement reconciliation process



2019 URF Exchanges

Call for new URF Exchange Proposals

- Both intra- and inter- year proposals sought
- Evaluated on both return ratio and flexibility of terms
- Avoiding “priority sales” for new 2019 agreements
- Individual or group of Friant Contractors may submit proposals, due January 4, 2019
- RFP circulated next week
- 4 types of exchanges sought (proposals may combine types)

2019 URF Exchanges

Exchange Attributes	Desired Parameters			
	Inter-year Exchange for return in <u>spring</u>	Inter-year Exchange for return in <u>summer</u>	Intra-year Exchange	Carryover Exchange
Year of water made available to Friant Contractor	2019 (typically in hydrologic conditions forecasted as > 1000 TAF Natural River)	2019 (typically in hydrologic conditions forecasted as > 1000 TAF Natural River)	Optional in years 2019-2024 (typically in hydrologic conditions forecasted as > 1500 TAF Natural River)	Optional in years 2019-2024 (typically in hydrologic conditions forecasted for coming year as < 1000 TAF Natural River)
Months that water made available to Friant Contractor	April-May	April-May	April-May	February
Year of water returned to SJRRP	Optionally 2020-2024	Optionally 2020-2024	Same Contract Year	Same Calendar Year/ Following Contract year
Expected Hydrologic Conditions when water would be returned to SJRRP	Forecasted in March or April as 400-900 TAF Natural River (Critical-High and Dry)	Forecasted in April or May as 400-900 TAF Natural River (Critical-High and Dry)	—	—
Months that water would be returned to SJRRP	March-April	May-October	June-November	March
Advanced notification for return water	15 days	30 days	30 days	30 days



2019 ASO Update

- Successful in DWR Grant Request #1 for \$754,000
 - Covers 2019 ASO Flights
 - Covers 2019 and 2020 iSnobal modeling and other improvements
 - Interagency Agreements in process
 - ASO flights in 5 High Sierra watersheds
- DWR Grant Request #2 in progress for \$800,000
 - CU Boulder retrospective modeling of snowpack 2001-2019
 - Meteorology station improvements



2019 ASO Plan

- 6 ASO flights and analysis in San Joaquin
- Mammoth Lakes Basin will also be flown and modeled, serving as a calibration site
- iSnobal model reports Jan 1, Feb 1, Mar 1, Apr 1, Apr 15, May 1, May 15, Jun 1
- Testing of 10-day snowpack and snowmelt forecast using iSnobal and high-resolution forecast
- Improvements to ground-based snow sensors and meteorology stations

ASO and Related Funding

✓ = funded

● = FCO grant awarded

◐ = FCO grant application in progress

○ = California Legislative Request by FWA

Task	2017	2018	2019	2020	2021	2022
ASO Surveys	✓	✓	●	○	○	○
iSnobal Modeling	✓	✓	✓	●	○	○
High-Res 10-day Forecast to drive iSnobal into future			✓	?	?	?
DWR B120 integration with Models	✓	✓	✓	✓	✓	✓
Meteorology Station Improvements			◐	◐	◐	
Boulder Real-time SWE Reforecast	✓	✓	◐	?	?	?



URF RECONCILIATION



URF Reconciliation

- Despite best efforts, URFs may be allocated contrary to Class 1 / 2 Prioritization
 - We often struggle with determining whom to allocate URFs to, especially early in the Contract Year
 - In 2016 Class 2 Contractors received URFs even though it was less than 100% Class 1 for most of year
 - In 2018 Class 1 Contractors received URFs even though 100% Class 1 may be reached with addition of Recirculated water.
 - Can we track over/under allocations of URFs and reconcile in subsequent years?



URF Reconciliation

- Recapture/Recirculation water can be combined with water supply declarations to determine if Class 1 has reached 100%
- By using URF allocations (not deliveries) we can easily track URF over/under
 - Tier 1 and 2 URF “credits” would be tracked independently (2 reconciliation accounts for Class 1 and Class 2 contractors, 4 accounts total)
 - Accounting at the end of the Contract Year
 - Class 1 and 2 credits of the same URF tier would cancel each other out 1:1

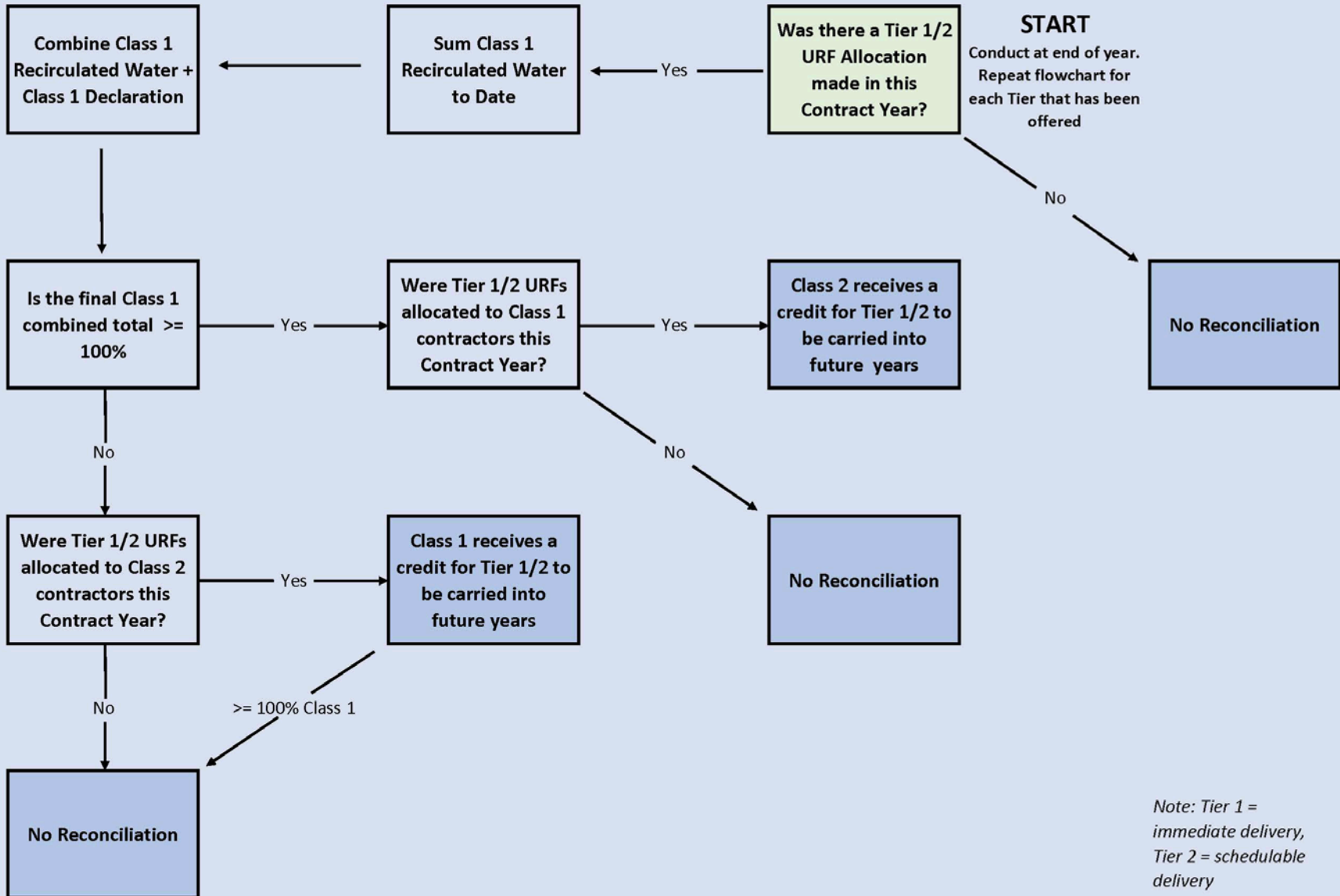
URF Reconciliation

Type	Delivery	Price	Terms
Tier 1	Immediate	\$20	Returns depend on Class 1 declaration
Tier 2	Scheduleable	\$375 to \$21	Price based on forecasted Natural River, (670 TAF to 4,500 TAF for this price range)

- Key Points of Proposal

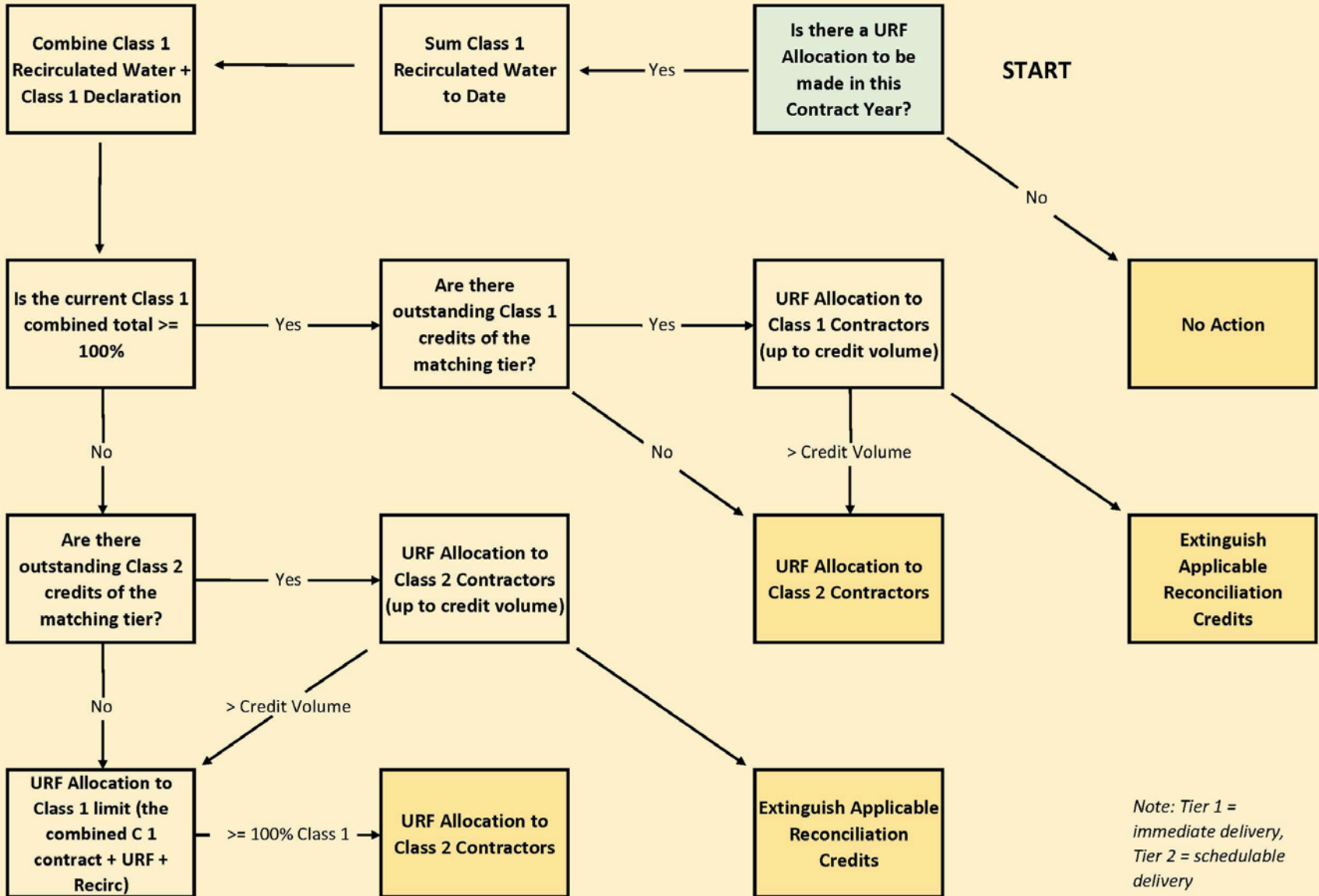
- Tier 1 and Tier 2 would be tracked separately
- URFs would be allocated to credit holders first before being allocated based on current hydrology
- URFs that were offered and not accepted would extinguish a credit
- Individual contractors' credits would not be tracked, only Class 1 and Class 2 in their entirety
- Price when credit is generated or extinguished does not matter
- Start tracking in 2019

URF Reconciliation Flow Chart



*Note: Tier 1 = immediate delivery,
Tier 2 = schedulable delivery*

URF Allocation Flow Chart



Note: Tier 1 = immediate delivery, Tier 2 = schedulable delivery



URF Reconciliation

- Example Reconciliation

- In 2019, dry conditions persisted into March when SJRRP made URFs available. Because less than 100% Class 1 was expected, 50 TAF of Tier 2 URFs were made available to Class 1 contractors
- April storms pushed the declaration to 100% class 1, with subsequent URFs being allocated to Class 2 contractors
- This results in 50 TAF of Tier 2 credits being assigned to Class 2 contractors.

- Example Allocation

- Any future year where Tier 2 URFs would be available to Class 1 contractors would result in up to 50 TAF being first offered to Class 2
- The offering of these URFs would extinguish these credits, regardless of whether all Class 2 contractors participated in this sale



GUIDELINES, PLANS AND PROJECT UPDATES

Restoration Flow Guidelines

Current Effort “RFG 2.1”

- Allocations and Schedules
 - Water Supply Test to ensure RA recommendations to not increase water delivery reductions as compared to Exhibit B of Settlement
 - Detail of how Default Flow Schedule is developed, particularly Riparian Recruitment Flows
 - When and how Restoration Allocations are made
 - Other operational details
- RWA accounting
- Reorganize order of chapters
- To be completed by March 1, 2019

Restoration Flow Guidelines

Next up: RFG 2.2

- Gravelly Ford Accounting
 - When Holding Contracts less than Exhibit B, how is Restoration Allocation debited?
 - Other flow target compliance issues at GRF
- Flood Flows
 - When do flood flows meet RA recommendation
 - Clarity on flood routing, important for informing Reach 2B project (Compact Bypass around Mendota Pool and associated control structures)
- Complete by spring 2020



Recapture & Recirculation Plan

Plan Purpose

- Toolbox of measures for the recirculation, recapture, reuse, exchange or transfer
- Procedures for measuring, forecasting, scheduling, allocating, and accounting

Existing Documents

- Draft Plan 2011
- Delta Recapture pilot plan, Draft 2017
- NEPA compliance:
 - PEIS/R, Recirculation EA, Transfer and Exchange to Red Top EA, Lower SJR Recapture EA



R&R Plan Revision Process

- Kickoff meeting and issue identification
 - October 3
- Small workgroup meetings
 - Address/reconcile issues, and plan revisions
- Integration and finalization
 - Settling Party and Policy review



Small Workgroup issues

- Restoration Area Recapture
 - Accuracy and improvements to gauges
 - Loss factor assumptions and updates
 - Continue into the future?
- Lower San Joaquin River Recapture
 - Permits and agreements
 - Temperature or water quality effects
- Delta Recapture
 - Operation constraints and impacts to recapture
 - Tracking relatively small flows
 - Recognizing improvements of Restoration Flows
- Recirculation
 - Allocation flexibility versus risk to CVP SOD
 - Class 1/Class 2 reconciliation
 - Conveyance/exchange agreements and costs



LONG-TERM RECAPTURE AND RECIRCULATION OF RESTORATION FLOWS EIS/R

EIS/R Alternatives

- Alternative 1 - No Action/No Project Alternative
- Alternative 2 – Continue Existing Temporary Recirculation Actions
- Alternative 3 – Maximize Use of Existing Facilities
- Alternative 4 – Expand Existing Facilities
- Alternative 5 – Construct New Facilities

**San Joaquin River Restoration
Program Long-term Recapture and
Recirculation of Restoration Flows
Project**

Second Administrative Draft
Environmental Impact Statement/ Report



March 2018

EIS/R Alternatives

- Alternative 1 - No Action/No Project Alternative
- Alternative 2 – Continue Existing Temporary Recirculation Actions
- Alternative 3 – Maximize Use of Existing Facilities
- Alternative 4 – Expand Existing Facilities
- ~~Alternative 5 – Construct New Facilities~~

San Joaquin River Restoration
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March 2018

Recap Development of EIS/R



Stakeholder Outreach



Questions?



FRIANT-KERN CANAL REVERSE FLOW PUMP-BACK PROJECT



FRIANT-KERN CANAL CAPACITY CORRECTION



FRIANT SURCHARGE



Friant Surcharge – What is it

- An original provision under the Central Valley Improvement Act establishing a surcharge of \$7.00/acre foot to Friant Division contractors to be used for the restoration of the San Joaquin River once a plan is developed.
- The 2006 SJRRP Settlement directs the use of the CVPIA surcharge for restoring the San Joaquin River. Public Law 111-11 Authorizes the surcharge funds to continue to collect for the Restoration and identifies the Settlement and Settlement Act as the “plan” satisfying provisions in CVPIA.



Friant Surcharge - Continued

- Beginning in 2019 the surcharge is reduced from \$7.00 to no less than \$4.00 unless:
 - You had not converted your repayment contracts as provided in Sec 10010 of the Settlement Act
 - Or it is determined by the Secretary that the costs are needed to continue to cover the ongoing federal costs of the Settlement...
- If the Secretary needs the to continue to collect the surcharge, Reclamation should reduce the contractor's O&M Obligation by an equivalent amount.

Friant Surcharge – What Next

- A Discount is coming one way or another
 - This discount will be fixed between 2019 – 2039
 - It will not be more than \$3.00/acre foot total
- Where are we in the Decision
 - The Program needs the money to cover the ongoing cost
 - Still in discussions with finance MP - 3000 on whether we can legally reduce the cost of the O&M obligation



Friant Surcharge - Questions

- Question for the Contractors
 - Is there a preference by the Contractors for where the reduction should be
 - Note that the decision will be across the board and we can't have it one way for one contractor and one way for another.
- Questions for the Program



BREAK



ON-RIVER CONSTRUCTION PROJECTS

Stakeholder Feedback

- What is working about these meetings?
- What have you found most valuable in these meetings?
- What would you like to see improved or expanded?
- What is missing that you would like to see adopted in future meetings?
- Change meeting frequency or format?
- Suggestions for discussion or lecture series topics?



NEXT MEETINGS

Next Meetings

Date	Location
January 22, 2019	Sacramento
March 29, 2019	Visalia
May 31, 2019	Visalia
September 27, 2019	Visalia