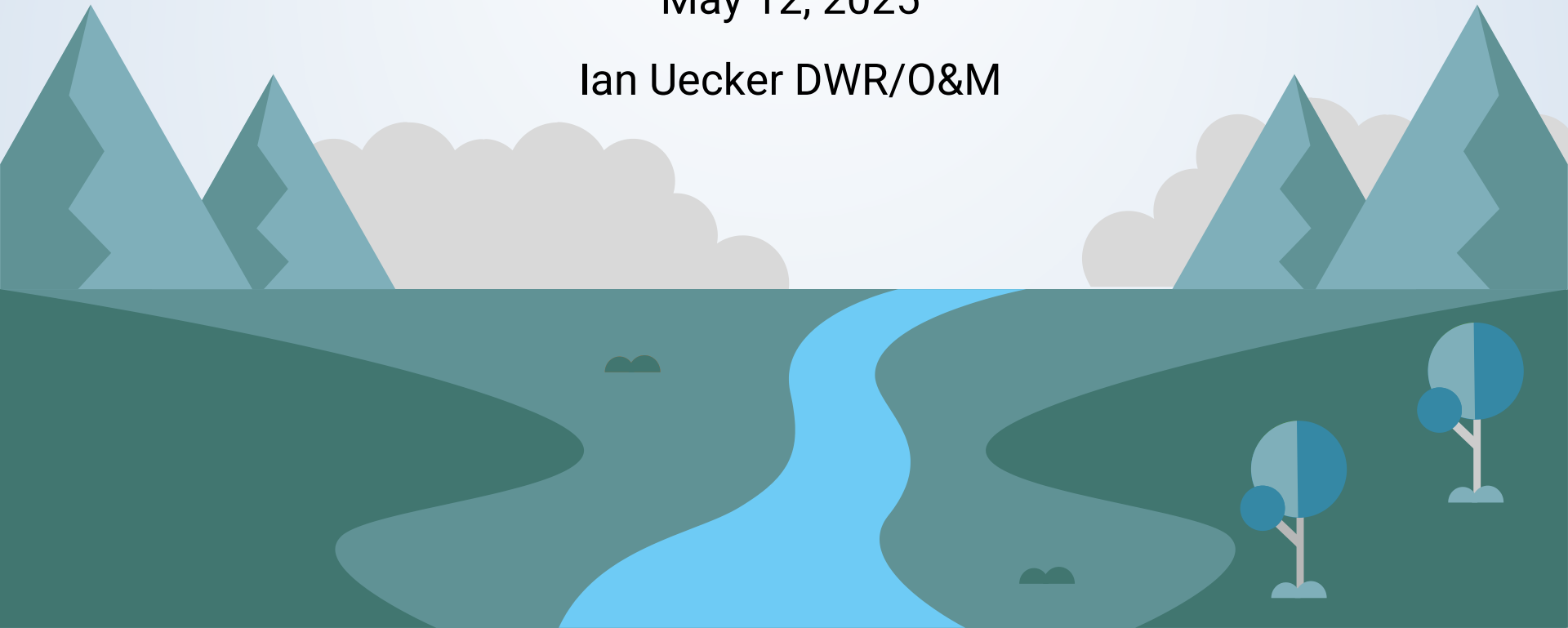
Delta Accounting Overview

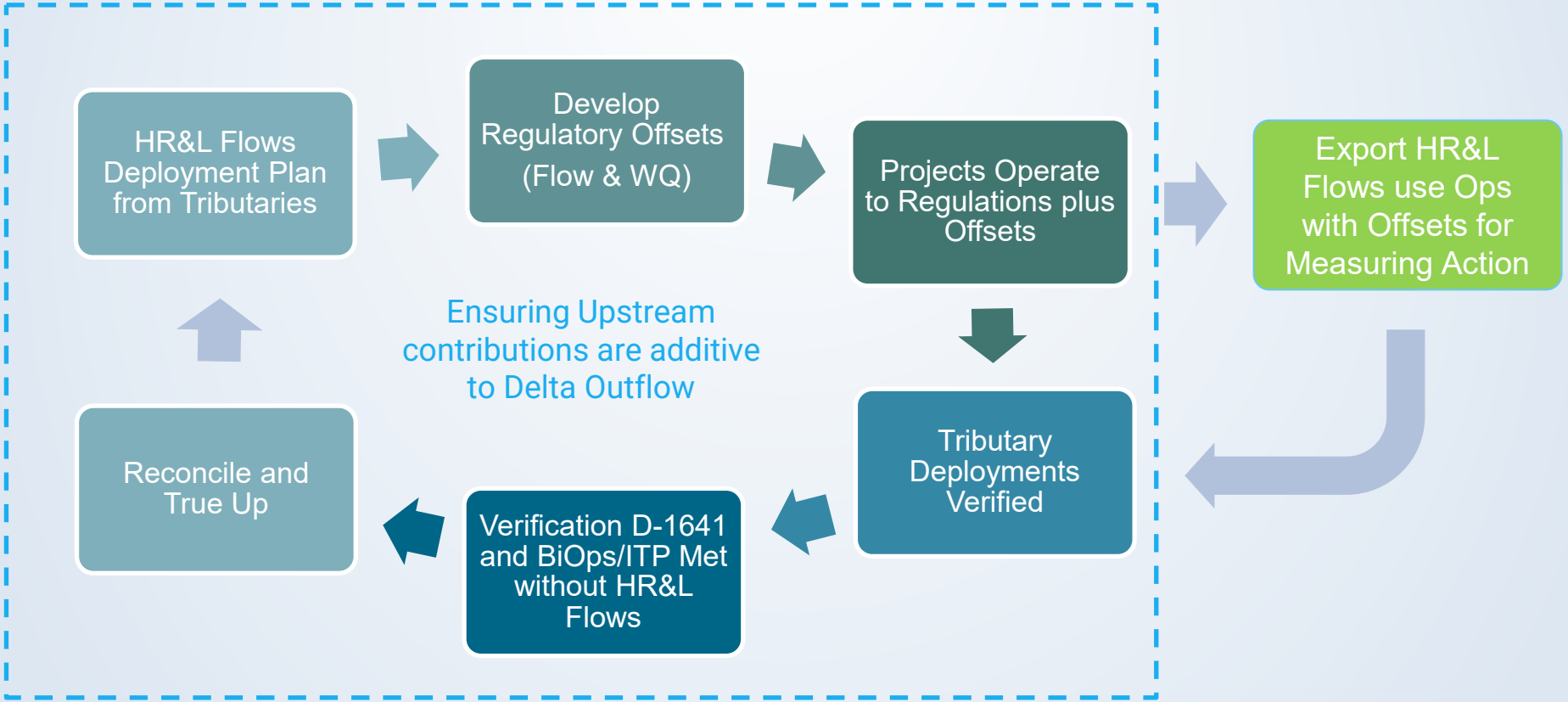
for Agreements to Support Healthy Rivers and Landscapes

May 12, 2025

Ian Uecker DWR/O&M



Delta Accounting Process



Objective of the Methodology

- Operational decisions must be made quickly in the Delta
  - Most days, changes to CCFB must be settled by 9:00 am
- Not all information will be available in time for these decisions
- Projects need a basis to operate day-to-day

HRL Delta Accounting Process

1. Develop aggregate flow schedule
2. Develop offsets to operational objectives
3. Develop daily accounting
4. Reconcile differences

Develop Aggregate Flow Schedule

Source	C (15%)	D (22%)	BN (17%)	AN (14%)	W (32%)
San Joaquin River Basin					
Minimum Placeholder Contributions (Stanislaus and Merced)	11	83	101	85	0
San Joaquin Basin Portion of Gap	0	11	2	10	0
Tuolumne	37	62	78	27	0
Sacramento River Basin					
Sacramento	2	102	100	100	0
Feather	0	60	60	60	0
Yuba (YWA)	0	60	60	60	0
American	30	40	10	10	0
Mokelumne*	0	5	5	7	0
Putah	7	6	6	6	0
CVP/SWP Export Reduction	0	125	125	175	0
PWA Water Purchase Program					
Fixed Price	3	63.5	84.5	99.5	27
Market Price	0	50	60	83	0
Permanent State Water Purchases	65	108	9	52	123
Year 1 New Outflow Above Baseline (Low Target)	***155***	***775.5***	***700.5***	***774.5***	***150***

This presentation of the accounting methodology uses a monthly time-step to explain the concept, however the concept could be applied to other time-steps as well (Biweekly, Weekly, Etc.)

Offsets to Operational Objectives

- Example: X2 offset for additional 1500 cfs NDOI in April
  - Collinsville applies all month
    - **Assuming** 1,500 cfs outflow freshens CLL by 800 uS/cm
    - **D1641 Standard:** 7,100 cfs or 2,640 uS/cm
    - **D1641 + Offset:** 8,600 cfs or 1,840 uS/cm
- Actual Operations will meet the Standards + Offset

Daily Flow Accounting

- Once more detailed flow information is available actual flows can be offset
- Example: Offset Freeport

  Actual Freeport: 15,000 cfs

  Daily Sacramento HRL: 1,000 cfs

  HRL offset Flow: 14,000 cfs
- A hypothetical set of Project operations will be built around these adjustments using actual standards

Operational Targets vs Daily Accounting

Operational Targets

$$Actual\ Flow \geq Standards + Offset_{Monthly}$$

- Monthly Offsets are **Estimated**

Daily Accounting

$$Actual\ Flow\ - Offset_{Daily} \geq Standards$$

- Daily Offsets are **Verified**

Not an exact match, differences must be reconciled

Reconcile Differences

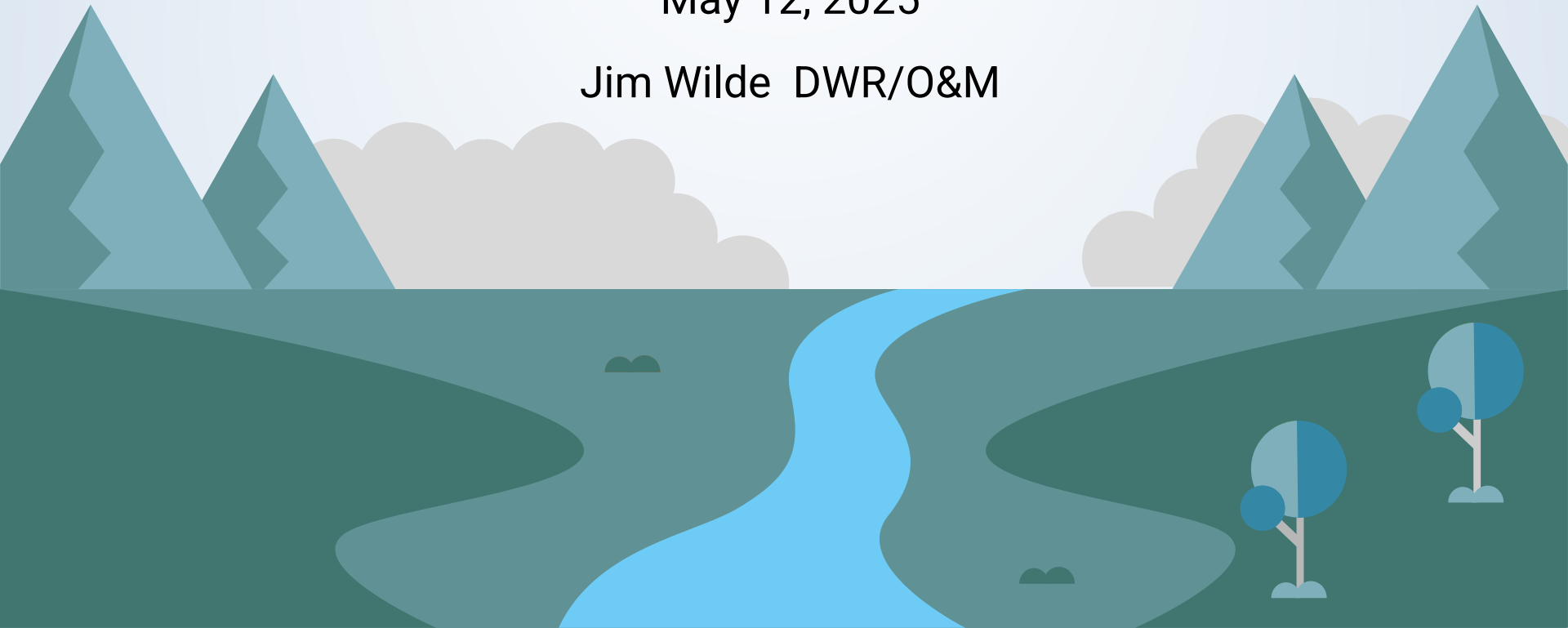
- Discrepancies will arise due to
  - Operating with a Monthly offset and accounting with a Daily offset
    - Can be reconciled with subsequent month's offset
  - Differences between planned and actual flow releases
    - Requires HRL parties to reconcile

Export Accounting

for Agreements to Support Healthy Rivers and Landscapes

May 12, 2025

Jim Wilde DWR/O&M



Healthy Rivers and Landscapes Program Flow Measures Table

MOU Export reduction quantities based on

- Water Year Type
- The Program
- Available water to cut

Source Category	Specific Source	C (15%)[4]	D (22%)	BN (17%)	AN (14%)	W (32%)
Phase 1						
San Joaquin River Basin	*Minimum Placeholder Contributions (Stanislaus and Merced)*[5]	*11*	*83*	*101*	*85*	*0*
San Joaquin River Basin	*San Joaquin Basin Portion of Gap*[5]	-	*11*	*2*	*10*	-
San Joaquin River Basin	Tuolumne[15]	37	62	78	27	0
Phase 2						
Friant	-	0	50	50	50	0
Sacramento River Basin[6]	Sacramento[7]	2	102	100	100	0
Sacramento River Basin[6]	Feather	0	60	60	60	0
Sacramento River Basin[6]	Yuba	0	60	60	60	0
Sacramento River Basin[6]	American[8]	30	40	10	10	0
Sacramento River Basin[6]	Mokelumne[13]	0	5	5	7	0
Sacramento River Basin[6]	Putah[9]	7	6	6	6	0
CVP/SWP Export Reduction[10]	-	0	125	125	175	0
PWA Water Purchase Program	Fixed Price	3	63.5	84.5	99.5	27
PWA Water Purchase Program	Market Price[11, 14]	0	50	60	83	0
Permanent State Water Purchases[12]	-	65	108	9	52	123
Year 1 New Outflow Above Baseline (Phase 2)		***107***	***669.5***	***569.5***	***702.5***	***150***
Year 1 New Outflow Above Baseline (Phase 1 and 2)	-	***155***	***825.5***	***750.5***	***824.5***	***150***

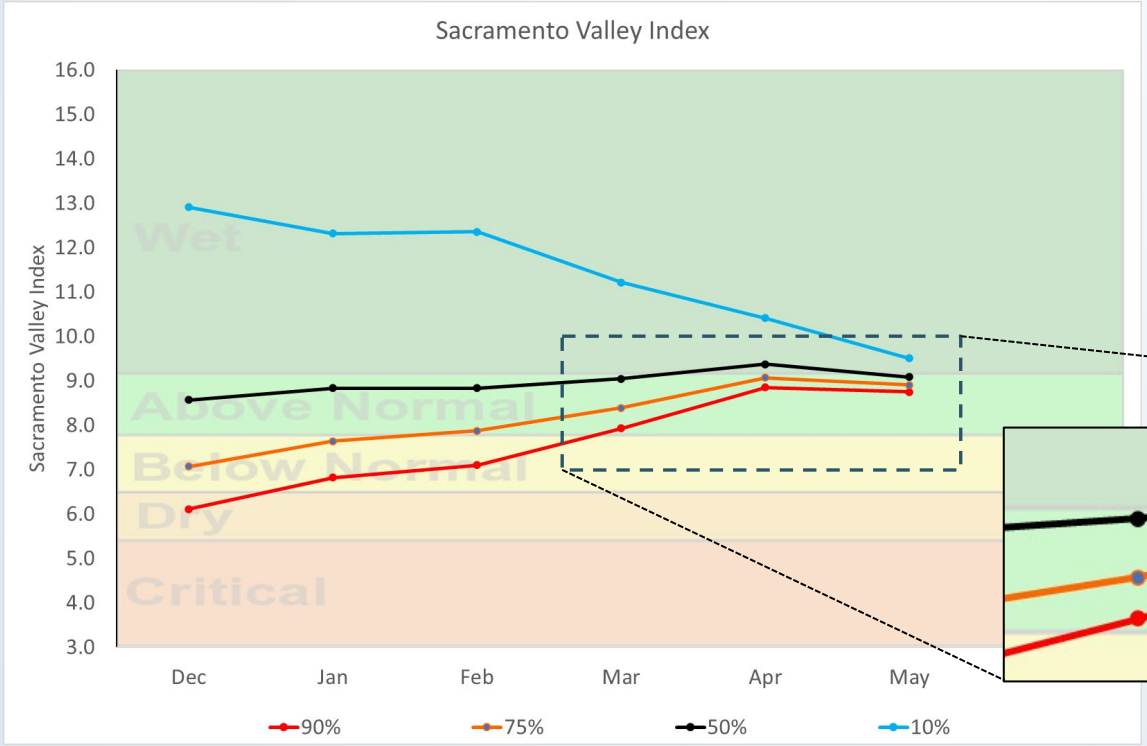
Source Category	Specific Source	C (15%)[4]	D (22%)	BN (17%)	AN (14%)	W (32%)
CVP/SWP Export Reduction[10]	-	0	125	125	175	0
PWA Water Purchase Program	Fixed Price	3	63.5	84.5	99.5	27
PWA Water Purchase Program	Market Price[11, 14]	0	50	60	83	0

Overview of Export Operational Action

- Proposed Action
  - Reduce SWP and CVP Exports until desired accumulated volume is achieved
  - Only applies to unstored water – that is water not coming from Project storage

- Initiation of Action
  - Upon issuance of B120 Forecast in D, BN and AN Years
  - **March** to be based on 90% forecast
  - **April** to be based on 75% forecast
  - **May** to be based on 50% forecast

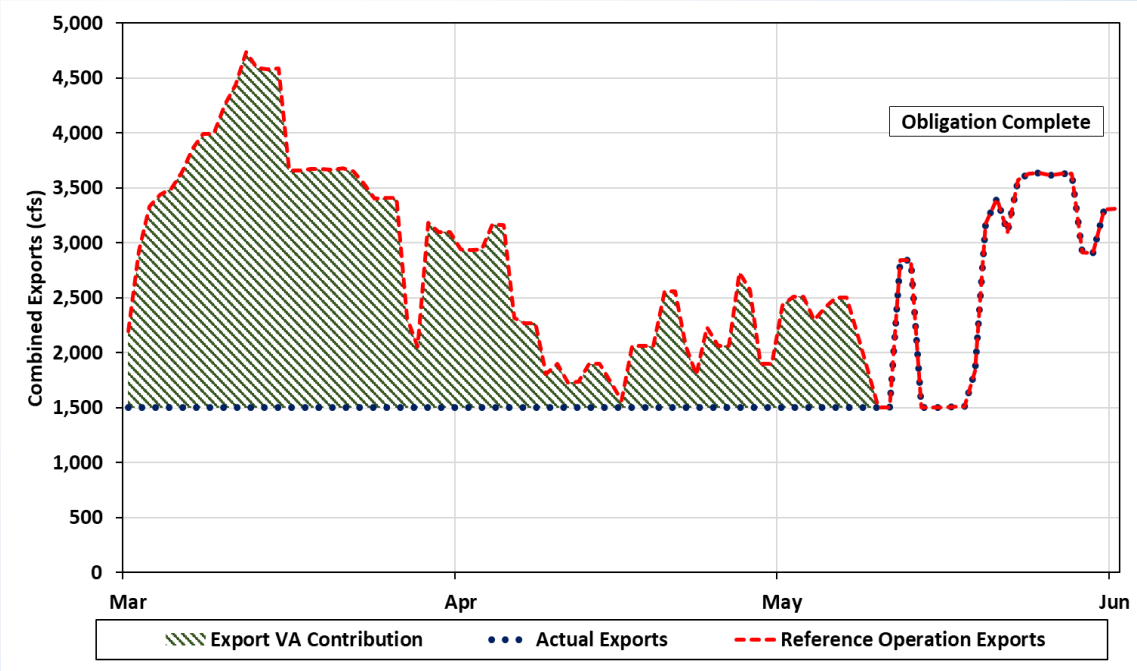
Sacramento Valley Index – WYT Forecast



Flow Operations Team Plan for 2025 Dry-run:
Continuing mock HRL deployments for Above Normal Year

Deployment of Export HR&L Flow

- Flow is made available through foregone export (reference - actual)
- Applies up to the volumes specified in MOU
- Factors used to develop Reference Operations (how much we could have exported?):
  - Delta inflows prior to HR&L
  - D1641 objectives (e.g. X2,VNS)
  - Physical and permitted export
  - OMR Requirements
  - Downstream Project limits
    - Storage, Conveyance capacity



Export HRL Contribution = Exports ***Reference Operation*** – Exports ***Actual***

Control with Delta Conditions

- Excess
  - Permit, Physical, Downstream limitations
- Excess with Restrictions
  - OMR, EI, VNS 1:1
- Balanced
  - Outflow & Water Quality (X2)

Export Reference Equations:

Many equations to daily track requirements and potential contribution to get fina
HR&L contribution. *(Simplified examples below)*

Excess

$$Export_{Ref(ExC)} = min(CVP_{Permit}, CVP_{Capacity}, CVP_{downstream}) + min(SWP_{Permit}, SWP_{Capacity}, SWP_{downstream})$$

Excess w/Restriction

$$Export_{OMRI} = \frac{OMRI - A \cdot (VNS - HRL_{VNS}) - C}{B} - OSD$$

$$Export_{VNS1:1} = VNS - HRL_{VNS}$$

$$Export_{EI} = (Delta\ Inflow - HRL) \times EI_{Ratio}$$

$$Export_{Ref(RC)} = min(Export_{OMRI}, Export_{VNS1:1}, Export_{EI})$$

Balanced

$$Export_{NDOI} = NDOI_{Act} - NDOI_{D1641} - HRL$$

$$Export_{WQ} = Q_{Gm(Act)} - Q_{Gm(D1641+HRL)}$$

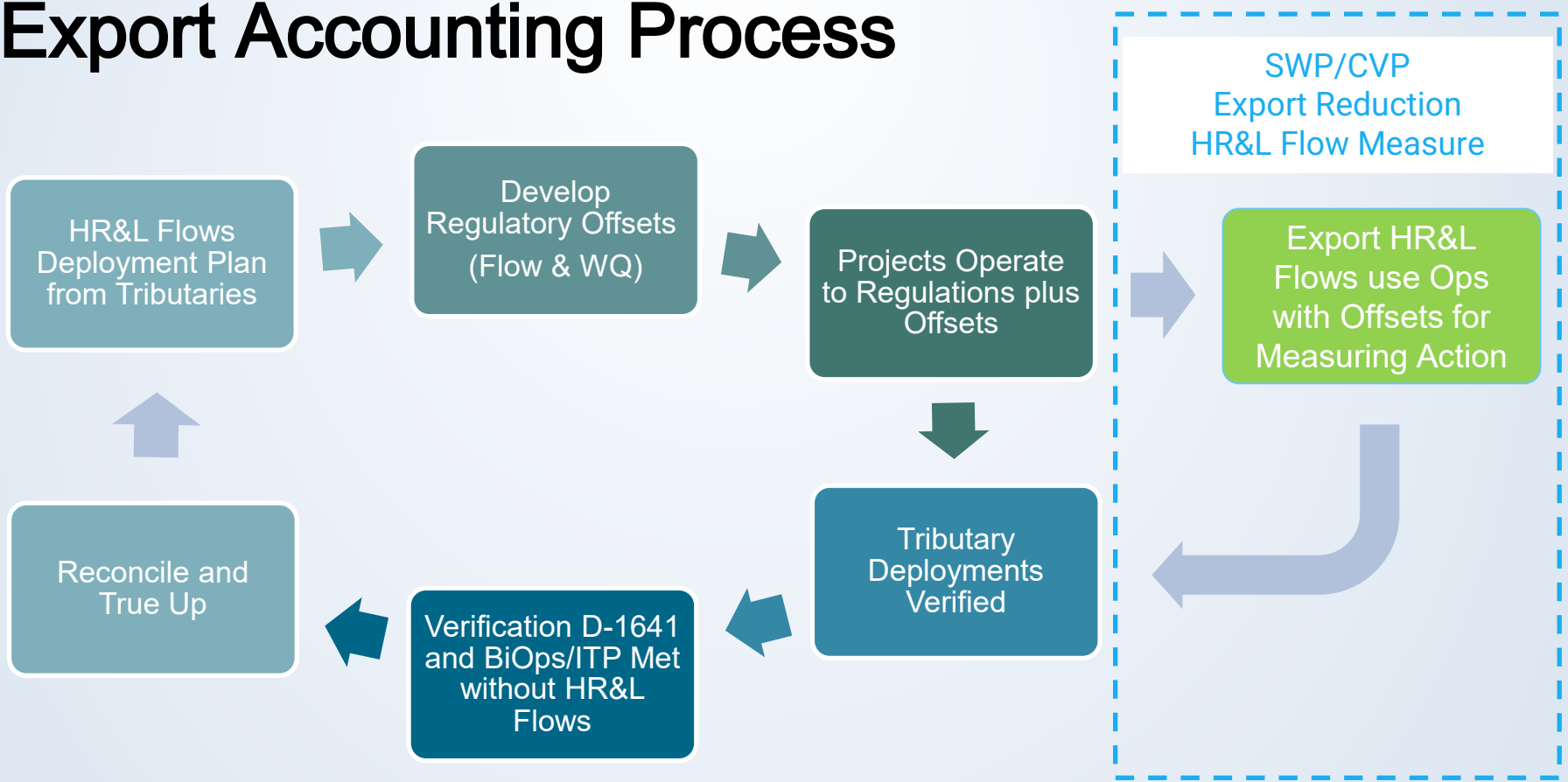
$$Export_{Ref(X2)} = max(Export_{NDOI}, Export_{WQ})$$

Final Reference:

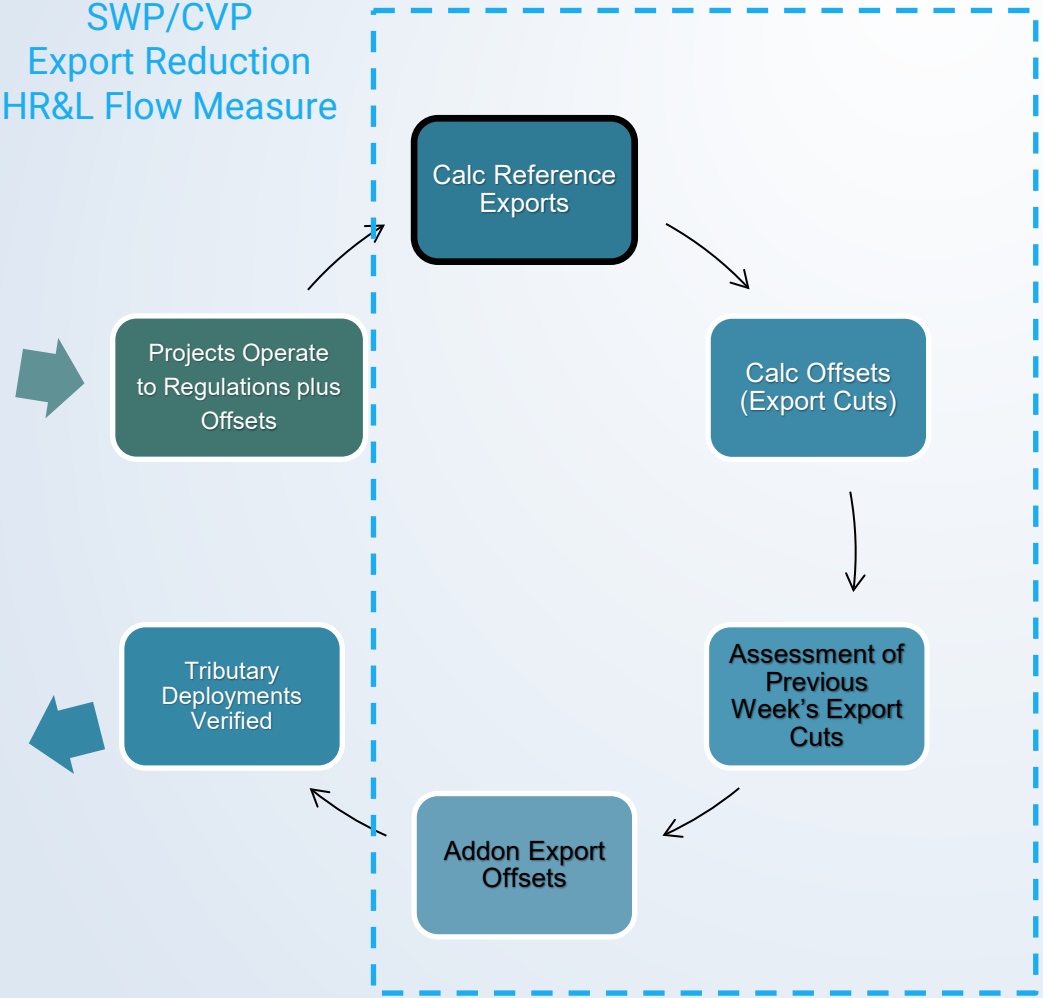
$$Export_{Reference\ Operation} = min(Export_{Ref(Exc)}, Export_{Ref(ExcR)}, Export_{Ref(Bal)})$$

Export HRL Contribution = Exports $_{Reference\ Operation}$ − Exports $_{Actual}$

Export Accounting Process



SWP/CVP
Export Reduction
HR&L Flow Measure



Export Reduction Assessments

(weekly or more frequent if conditions require)

Export Reference Considerations

- System-wide requests for Delta outflow
- Upstream HR&L Offsets
- Delta objectives
- Export constraints
- Operational parameters

Export Offset Considerations

- Water Year Type per Bulletin 120
- Tally of Export contributions
- Movement of stored water
- Water for Health and Safety

All will be continually monitored, assessed, accounted, and coordinated for optimal use of the HRL flows.

Summary of Export Methodology Objectives

- Demonstrates Projects are not exporting HR&L flows, annual report will be published
- Provides Projects are making decisions day-to-day on how to meet requirements
- Method provides Projects an offset which is added to the requirements
- Provide way to verify Projects met obligations without HR&L flows

Questions and Discussion