

Agenda Item 3.2

Reservoir Losses and Available Storage

Joint Authority Board & Reservoir Committee

April 21, 2023

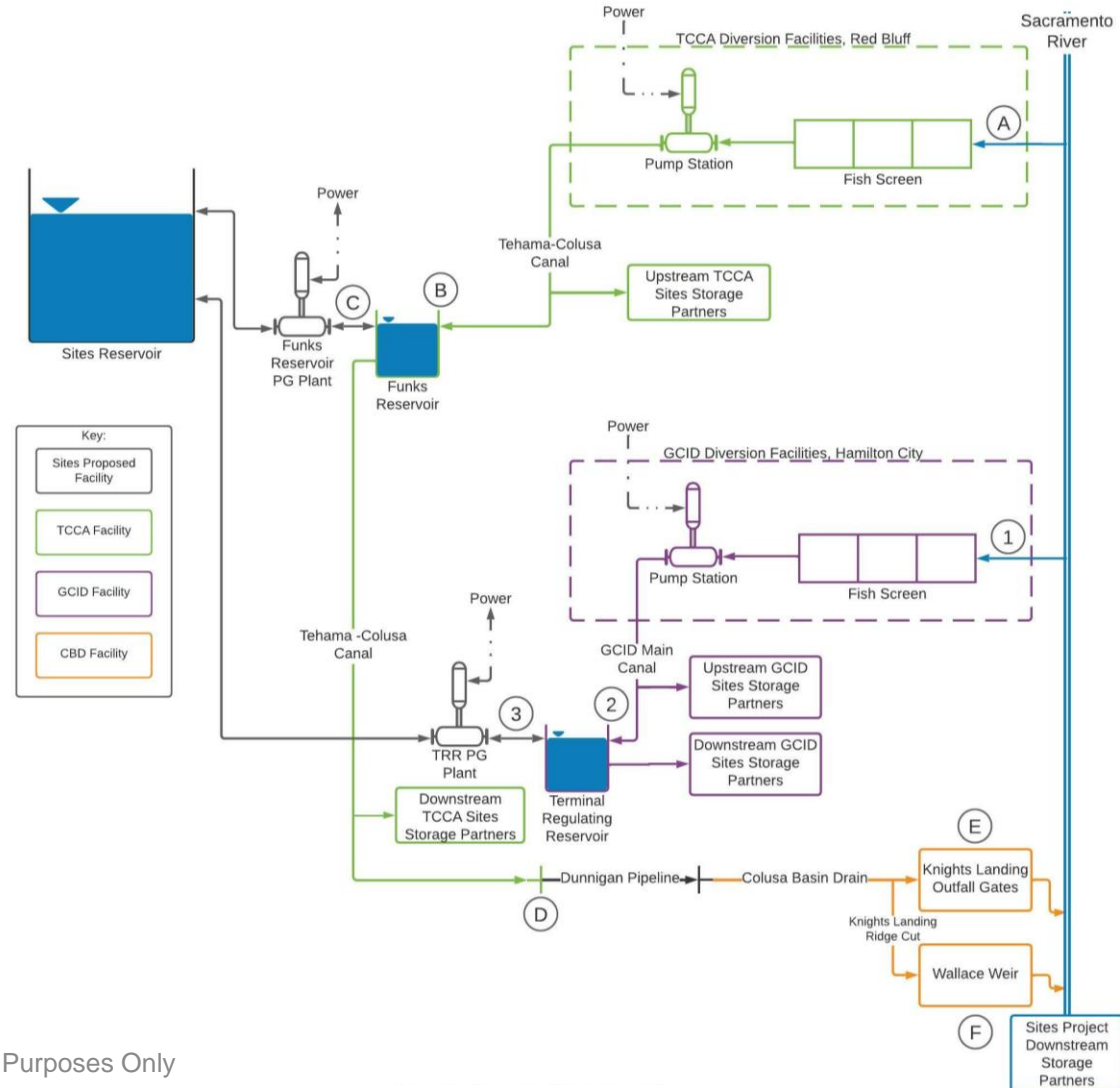
Purpose

- Review assumptions for water losses which occur along the flow path from points of diversion to points of delivery
- Reaffirm change in dead pool storage from 120 TAF to 60 TAF and confirm available storage assumption of 1.41 MAF
- Discuss concept for managing reservoir at low volumes if there is a water quality concern

Sites Project Facilities

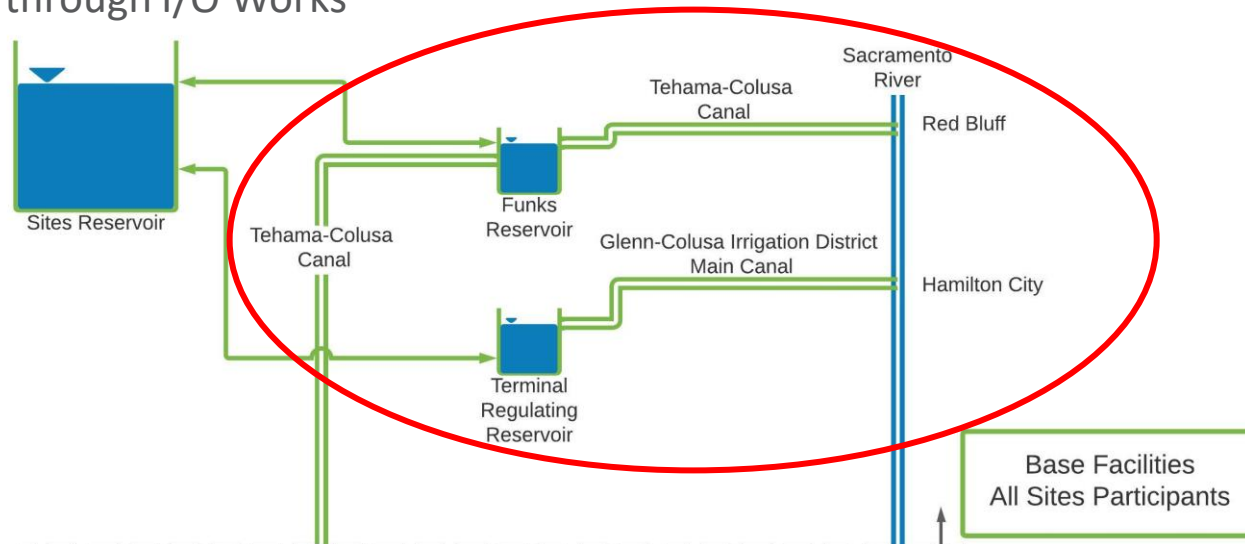
• Sites Flow Path

- Sacramento River
 - TC diversion and canal
 - GCID diversion and canal
- Funks/TRR to Sites Reservoir
- Sites Reservoir to TC Canal and GCID Canal
- Dunnigan Pipeline, Colusa Basin Drain, and Sacramento River
- Delta export facilities and/or participant point of delivery

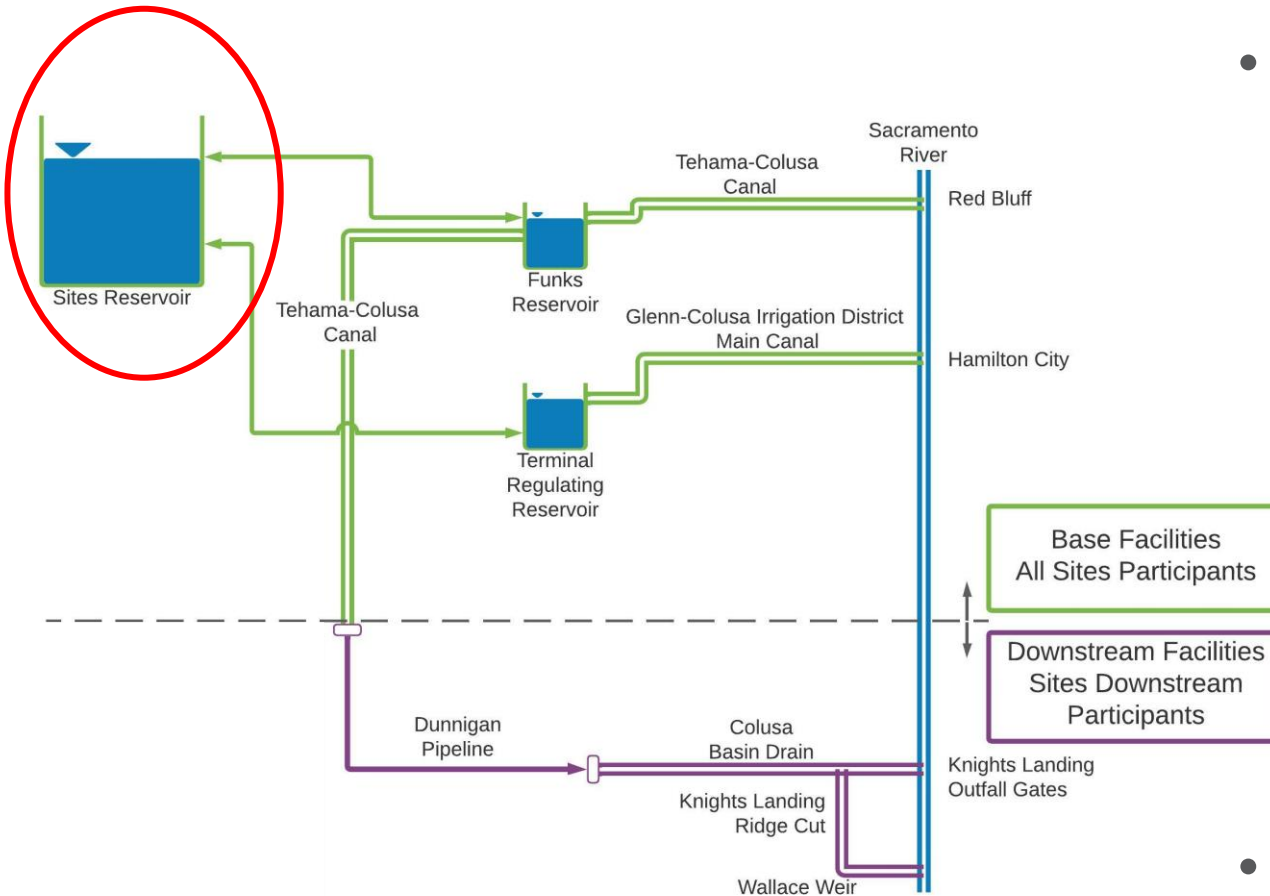


Modeled Losses – Diversions

- Tehama-Colusa Canal is concrete lined
 - Up to 2,200 cfs diversion
 - Estimated 1% loss for modeling purposes from RBPP to Sites Reservoir
- Glenn-Colusa ID Main Canal is unlined
 - Up to 2,000 cfs diversion
 - Estimated 2% or 13%, depending on season, loss for modeling purposes from Hamilton City to Sites Reservoir
- Losses occur prior to reaching Reservoir
 - Volume added to each Storage Partners' storage space will be based on amount entering through I/O Works

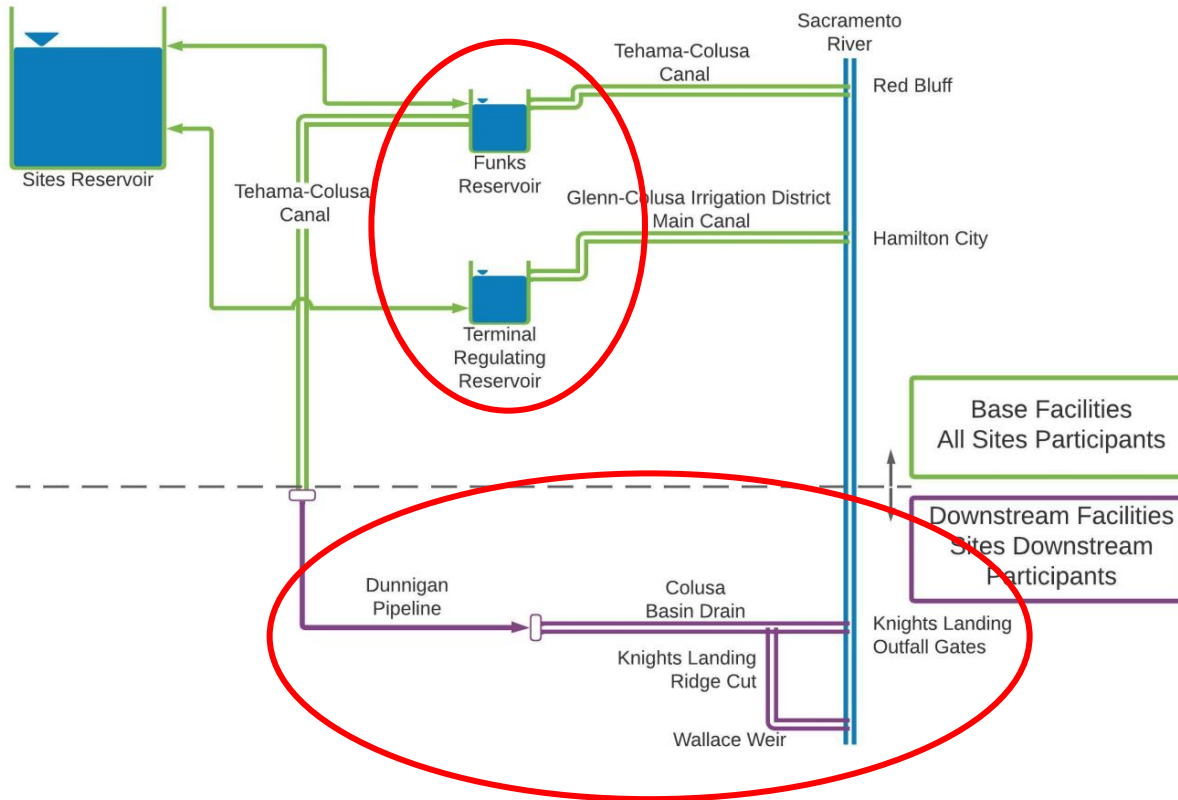


Losses – Reservoir



- Evaporation
 - Estimated as approx. 10% per year
 - Planned to be refined with future measurements
 - Will be “charged” to Storage Partners proportionally
- Seepage and other calculated losses may also be applied proportionally

Losses – Releases for Storage Partners



- The primary point of delivery will be Funks or TRR
- The Sites Authority may retain control to facilitate a secondary point of delivery
- Storage Partners are responsible for losses after the primary point of delivery

Losses – Releases for Storage Partners

- Deliveries to NOD Storage Partners
 - No losses assumed in Project modeling
 - However, losses will be defined in wheeling agreements, if applicable
 - No modeled deliveries to NOD partners along Sacramento River below KLOG (losses would need to be assessed in the future for these deliveries)
- Deliveries to Yolo Bypass (State)
 - Assumed 13% loss during April through October when deliveries will be made
 - May be need for downstream measurement location (e.g., Wallace Weir) to quantify volume delivered for Prop 1 benefits

Losses – Releases for Storage Partners

- Deliveries to North Bay Aqueduct
 - Modeled assumption:
 - If delivered via Yolo Bypass, 13% loss is currently assumed
 - If delivered via Delta, model assumes losses would be consistent with below
 - Working with American Canyon on conformance with SWP contract
- Deliveries through Delta to Export Facilities
 - No modeled losses applied in Sacramento River from KLOG to Freeport (may need evaluation)
 - Average estimated at 23% in modeling, but is highly dependent of water year type and calculations
 - Carriage Water will be assessed and determined consistent with current practices for transfer water

Summary of Losses

| Facility | Modeled Loss | Applied Loss |
|---------------------------|--|---|
| TC Canal | 1% year-round | Difference of measured diversions and total pumped into Reservoir through I/O Tower |
| GCID Main Canal | 2% or 13% seasonally | |
| Reservoir – Evaporation | 10% long-term average | Refined with future measurements |
| Reservoir – Seepage/other | ~1-2% for 1.8 MAF reservoir | |
| NOD Deliveries | None modeled | Pending wheeling agreements |
| Yolo Bypass | 13% loss April – October | n/a |
| North Bay Aqueduct | 13% via Yolo Bypass | Consistent with State Water Contract or DWR Wheeling Agreement |
| | 23% long-term average Carriage Water via Delta | Consistent with State Water Contract |
| Delta Export Facilities | 23% long-term average Carriage Water | Consistent with current practices for calculating CW |

Confirmation of Available Storage

- The EIR/EIS describes a 1.5 MAF nominal reservoir with a footprint based on a water surface elevation of 498ft
- Based on 2022 LIDAR information, a WSE of 498ft has an estimated storage volume of 1.47 MAF
- The dead pool is currently assumed to be 60 TAF
 - Dead pool will not be “charged” losses (e.g., evaporation)
- With survey refinements, and 60 TAF dead pool, available storage is 1.41 MAF
- 1.41 MAF represents the **Available Storage** to be offered to Storage Partners and will be used in updated financial modeling

Dead Pool Considerations

- Establishing a dead pool is a form of risk management
 - As dead pool shrinks, more shares/volume can be sold to reduce costs
 - But increases risk that water in storage gets “stuck” when storage is low
- Even with dead pool, there is still some risk
 - Any water in a Storage Partner’s account will not be lost, just held until water quality conditions improve (likely the following year)

Potential Water Quality Constraints

- Potential for releases to be limited/constricted when Sites Reservoir approaches dead pool
 - Ex. If a water quality issue is identified when storage is at 100 TAF, then 40 TAF of Storage Partner water may not be able to be released from Sites
- O&E Workgroup recommended Staff establish a standard approach that allows for discretion to adaptively manage real-time
 - This proposed language for Project documents will be brought to AB/RC after reaching agreement with workgroup

Conclusion

- Losses are assessed from point of diversion to point of delivery and the process will be described in the operations plan
- The available storage in the Sites Reservoir is 1.41 MAF and assumes a 60 TAF Deadpool
 - 1.41 MAF is allocated to storage partners
- A water quality concern may limit releases at a “low storage level”
 - Allocating capacity in these scenarios can get complicated and would benefit from operating experience
 - Develop language to describe this process in the operations plan

Questions?

