Interlake Tunnel and Spillway Modification Project

Progress Report

March 2022

Agenda

1. Introduction – a water storage project
2. Update on project benefits
   - Current model results and groundwater benefits
3. Changes in hydrologic models and effects on project
   - Baseline changes and reasons why
   - Features, scenarios, results
4. Capital costs of project and value of project benefits
   - Financing plan
5. Project schedule
6. Next steps

Disclaimer

The results presented herein are from an Unofficial Collaborator Development Version of a Preliminary Model. Access to the model and use of its data are limited to those who are collaborating on the model development. Once the model is published and receives full USGS approval it will be archived and released to the public. This preliminary data (model and/or model results) are preliminary or provisional and are subject to revision. This model and model results are being provided specifically to collaborate with agencies who are contributing to the model development and meet the need for timely best science. The model has not received final approval by the U.S. Geological Survey (USGS). No warranty, expressed or implied, is made by the USGS or the U.S. Government as to the functionality of the model and related material nor shall the fact of release constitute any such warranty. The model is provided on the condition that neither the USGS nor the U.S. Government shall be held liable for any damages resulting from the authorized or unauthorized use of the model.

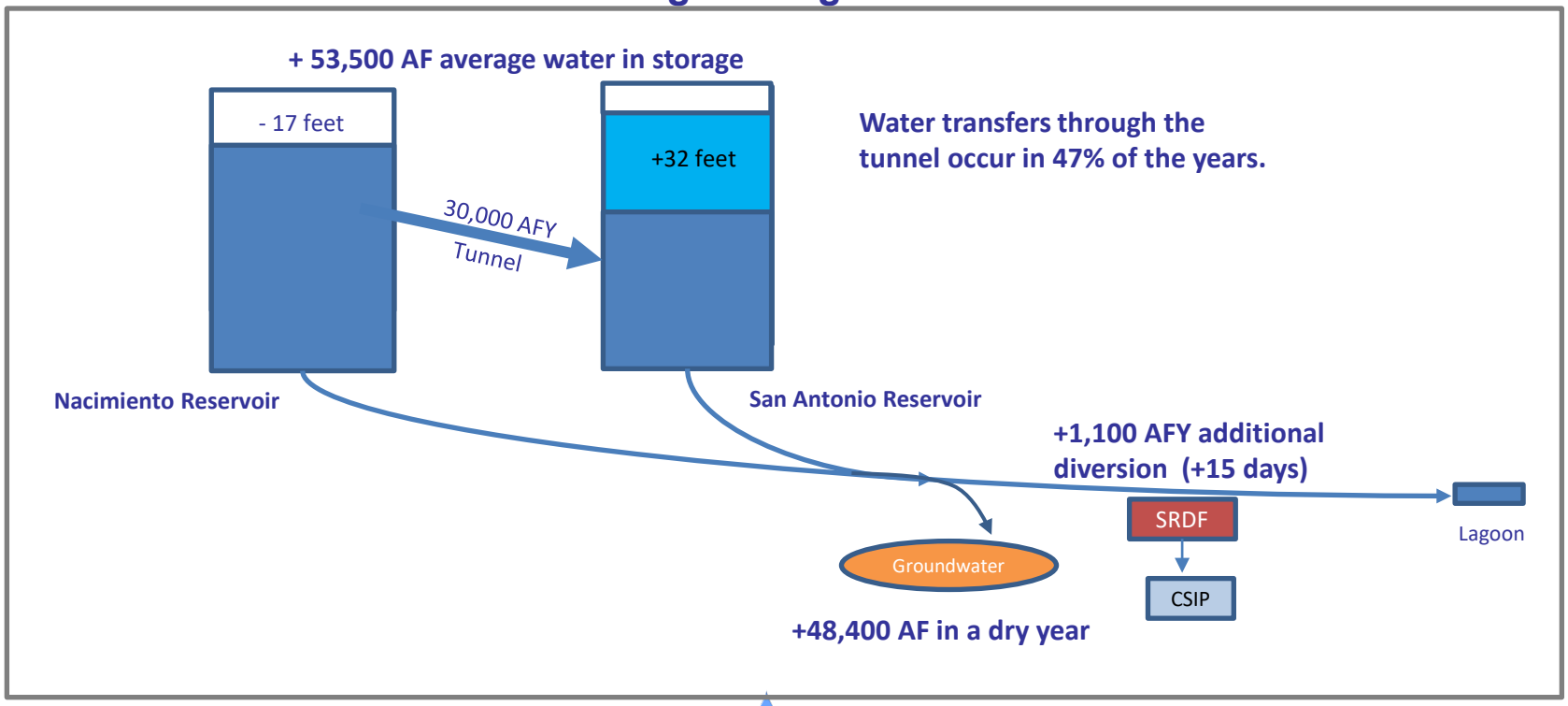
Interlake Tunnel – a water storage project

- The Interlake Tunnel and San Antonio Spillway Modification Project can capture wet year water that is released for flood control.
- Over the modeled period (1967-2014) 2,600,000 AF of water was released for flood control.
- With the tunnel and spillway modification in place for that period, **50% of the flood control releases could have been avoided – 1,310,000 AF**.
- The tunnel and spillway modification project would have transferred a total of 1,400,000 AF of water to storage.
- In 2017 the tunnel could have moved 88,000 AF from Nacimiento to San Antonio of the 192,000 AF that was spilled from Nacimiento.

SVOM Model results summary
Tunnel + 7′ Spillway Modification

- Increases average water storage by 53,500 AF
- Increases conservation releases by 14,400 AFY
- Reduces flood control releases by -17,000 AFY
- Improves performance of SRDF with additional 1,100 AFY
- Groundwater recharge benefit is greatest in dry years

Annual average changes from 2021 Baseline



SVOM Results Summary

Annual average, all year types

Description	Tunnel Only	Tunnel + 7' Spillway Raise
Change in Combined Storage (af)	+39,000	+53,500
Nacimiento Change in Stage (ft)	-18	-17
San Antonio Change in Stage (ft)	+29	+32
Tunnel Transfer (afy)	30,200	30,000
% of Years with Tunnel Transfer	51%	47%
Change in Non-Flood Control Releases (afy)	+9,900	+14,500
Change in Flood Control Releases (afy)	-11,700	-17,100
Change in SRDF Diversions (afy)	+1,000	+1,100
Change in SRDF Diversion Days	+13	+15

All differences are calculated from the 2021 Baseline scenario.
Numbers greater than 1,000 have been rounded to the nearest hundred.

Groundwater – Surface Water Interaction

Simulated Groundwater – Surface Water Interaction by Year Type (af/yr)

	Baseline	Tunnel-Only	Tunnel Plus 7' Spillway Raise
Avg. (All Years)	406,800	411,000	411,400
	Difference from Baseline	*4,300*	*4,600*
		Difference from Tunnel-Only	*340*
Avg. (Wet Years)	625,100	607,100	606,500
	Difference from Baseline	*-18,000*	*-18,600*
		Difference from Tunnel-Only	*-590*
Avg. (Normal Years)	376,900	371,300	371,200
	Difference from Baseline	*-5,600*	*-5,600*
		Difference from Tunnel-Only	*-44*
Avg. (Dry Years)	225,300	271,700	273,800
	Difference from Baseline	*46,400*	*48,500*
		Difference from Tunnel-Only	*2,000*

Includes all stream loss to the aquifer (groundwater recharge, riparian evapotranspiration)

Groundwater recharge benefit is greatest in dry years: 48,500 AF

Baseline vs Project Models

- Started with an “historical” model
  - Uses actual historical hydrology, land use
  - Allows for calibration of model parameters
- Baseline
  - Historical model is the foundation
  - Land use is held constant
  - Present day reservoir operations and projects throughout the 47-year model period
  - Reduces variables, allows for comparisons
- Project scenarios
  - Adds a project to the baseline

Changes to hydrologic models

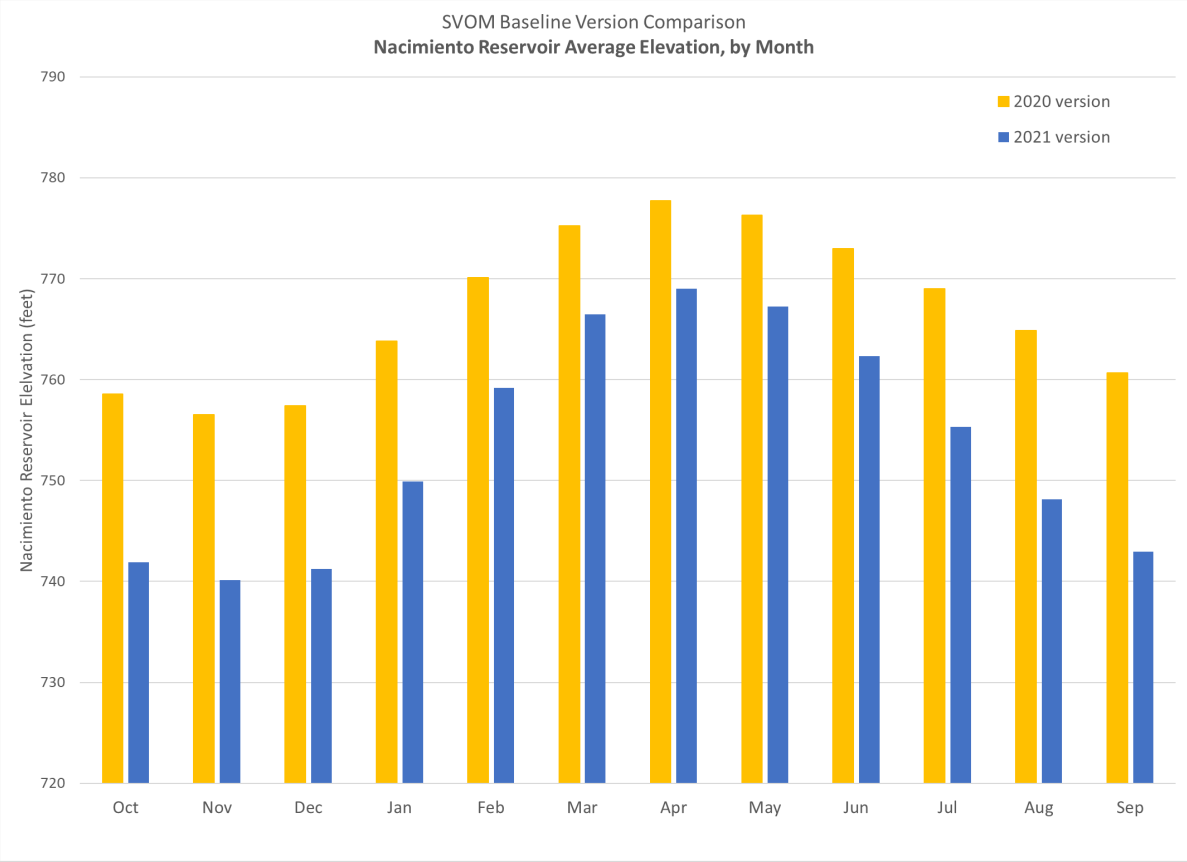
- Incorporated water rights limitations and environmental commitments.
- Streambed recalibration
  - Salinas River is “thirstier” than previously modeled. The basin is soaking up more water as it flows downstream.
- Baseline is different due to model refinements.
  - Current baseline better reflects reality.
  - Baseline requires increased releases to meet downstream demands after streambed recalibration.
    - Therefore, changes in project releases over baseline are less than in results from previous model versions.

Changes to hydrologic models

- Release ratio prioritizes Nacimiento, with additional demand met by San Antonio.
- Evaluated multiple operational strategies
  - Storage and release constraints determined to be the limiting factors.
- Water rights are tracked by the models but are not limiting the simulated operation of the Tunnel.
- Applies current conditions to historical data.
  - Simulations use actual climatic/hydrologic data.

Baseline version comparison

The 2021 SVOM requires more releases to achieve downstream demands. This **results in a lower average elevation at both reservoirs.**



Differences in Simulated Baseline Results related to model updates (avg. annual)

Description	Baseline 2020	Baseline 2021	Change
Storage (AF)	327,600	281,000	-46,600
Nacimiento Stage (Ft)	767	753	-14
San Antonio Stage (Ft)	708	704	-4
Non-Flood Control Releases (AF)	127,700	190,800	63,100
Flood Control Releases (AF)	80,100	57,600	-22,500
SRDF Diversion (AF)	9,700	9,600	-100
SRDF Diversion Days	138	136	-2

Notes
1. Values greater than 1,000 have been rounded to the nearest hundred.

The average combined storage didn't change much between the two baseline versions but how that water is moving through the system and accounted for changed.

Salinas Valley Operational Model Analysis

- Baseline holds land use constant at 2014 conditions.
- The model reflects current fully-functioning operations across entire period (1967-2014)
  - Held steady except adding tunnel and spillway in project scenarios.
- The high infiltration in the Salinas River places great demand on the reservoirs such that the additional water placed in storage is used up much more quickly (with or without the tunnel).
- Tunnel does a good job of moving a lot of water to San Antonio.
- Increased storage makes more water available, especially in non-wet years.

<u>Model capabilities</u>

- Provides a large range of data for evaluation.
- Future land use or climate data can be added.
- Can evaluate benefit of releases in 3rd consecutive dry year.

SVOM Results Summary

Annual average, all year types

2021 Baseline	Description	Tunnel Only	Tunnel + 7' Spillway Raise
281,000 af	Change in Combined Storage (af)	+39,000	+53,500
753 ft	Nacimiento Change in Stage (ft)	-18	-17
704 af	San Antonio Change in Stage (ft)	+29	+32
--	Tunnel Transfer (afy)	30,200	30,000
--	% of Years with Tunnel Transfer	51%	47%
190,800 af	Change in Non-Flood Control Releases (afy)	+9,900	+14,500
57,600 af	Change in Flood Control Releases (afy)	-11,700	-17,100
9,600 af	Change in SRDF Diversions (afy)	+1,000	+1,100
136 days	Change in SRDF Diversion Days	+13	+15

All differences are calculated from the 2021 Baseline scenario.
Numbers greater than 1,000 have been rounded to the nearest hundred.

Project benefits

- Aquifer is gaining more water from releases.
- Greatest benefit is in the dry years – groundwater recharge up to 48,500 AFY
- More water available for beneficial use
- San Antonio has more stored water enabling releases if Nacimiento is operationally down
- Increase in water available for SRDF diversions and operational days

Cost / Benefit Analysis

Development Work Accomplished

Desription	Prior to DWR Grant	Post DWR Grant (9/2016)	DWR Budget	Funds Remaining
Project Administration	$1,436,868	$2,712,038	$3,253,146	$541,108
Planning & Conceptual Engineering	$1,256,166			
Land Purchase Easements		$0	$124,000	$124,000
Hydrologic Modeling		$1,041,454	$674,634	($366,820)
Environmental and Permitting	$182,966	$1,074,797	$1,660,380	$585,583
Water Rights		$172,886	$550,000	$377,114
LiDAR Survey		$132,188	$132,188	$0
San Antonio Spillway Design		$947,951	$1,117,316	$169,365
Tunnel Design		$2,054,060	$2,488,336	$434,276
	$2,876,000	**$8,135,374**	**$10,000,000**	**$1,864,626**
Total Costs To Date		**$11,011,374**		

Estimate to complete

DWR Grant

Task Name	Actual Costs to Date	Budget remaining	ACTUAL % COMPLETE
DWR Grant	**$8,135,373.60**	**$1,864,626**	**81%**
Project Administration	$2,712,038.09	**$541,108**	83%
MCWRA Project Support	$922,323.30	**$276,483**	77%
Program Management	$1,789,712.69	**$264,628**	87%
Land Purchase Easements	$0.00	**$124,000**	0%
Planning / Design / Engineering and Environmental Documentation	$5,423,335.51	**$1,199,517**	82%
Hydrologic Modeling	$1,041,453.86	**$30,000**	154%
Environmental and Permitting	$1,074,797.49	**$585,583**	65%
Water Rights	$172,885.65	**$347,114**	33%
LiDAR Survey	$132,188.00	**$0**	100%
San Antonio Spillway Design	$947,950.72	**$0**	85%
Tunnel Design	$2,054,059.79	**$236,821**	83%

Capital Costs/ Funding Sources

Category	Description	Tunnel	Funding MCWRA	Funding DWR	State Fish Screen Grant	Funding Prop 218
Total	**Total**	**$226,355,736**	**$2,876,000**	**$10,000,000**	**$17,000,000**	**$199,355,736**
1000	**Project Development**	**$13,094,724**				**$7,784,738**
2000	**Tunnel Construction**	**$137,296,896**				**$120,296,896**
2500	**Spillway Modification**	**$7,484,873**				**$7,484,873**
3000	**Management & Administration**	**$18,097,721**				**$13,407,707**
4000	**Capitalized O&M Costs**	**$19,984,186**				**$19,984,186**
5000	**Contingency & Escalation**	**$21,717,265**				**$21,717,265**

Cost / Financing Analysis

Capital Costs

Capital Cost Estimate ($k - 2021)		Tunnel +Spillway Mod
1000	Project Development	$12,876
2000	Construction	$137,297
2500	Spillway Modification	$7,485
3000	Management & Administration	$18,098
4000	Capitalized O&M Costs	$19,984
4500	Capital Equipment Replacement Fund	$5,784
4600	Financing Fees	$2,896
5000	Contingency & Escalation	$21,717
Total		$226,137

Capital Costs	**$226,137 million**
Annual O&M and Debt Service for 30 years	**($14,385) million**

Financing Plan

Financing ($K)	
DWR Grant	($10,000)
CDFW Grant - Fish Screens	($17,000)
Prop 218	$199,137
Financing Assumptions	
Proposition 218 Bonds	
Interest Rate	5%
Term (Years)	30
Annual Costs ($k)	
Principal Amount To Finance	$199,137
Two years P&I Reserve	$22,000
Annual Debt Service	**($14,385)**

$1,198k per month for 30 years

Project Cost Allocation / Benefit Analysis

Cost Allocation – annual cost per acre

Debt Service Cost Allocation - $/Acre/Yr		
	Acres	Tunnel + Spillway Mod
All lands less "no charge"	418,784	-$34
Irrigated agriculture & flood lands	214,654	-$67
All lands except dry farming/grazing/vacant	257,329	-$56
Deferred Maintenance allocaton of equivalent acreage	256,105	-$56

Measurement metrics

Value of Benefits ($/AFY)	Average		Cost/Year/AF*
Change in storage	53,528	AF	$269
Change in flood releases	(17,119)	AFY	included
Change in conservation releases	14,451	AFY	$995
Improved SRDF performance	96	AFY	Included
Changes in groundwater recharge (AVERAGE)	4,598	AFY	$3,129
Changes in groundwater recharge (DRY Year)	48,486	AFY	$297

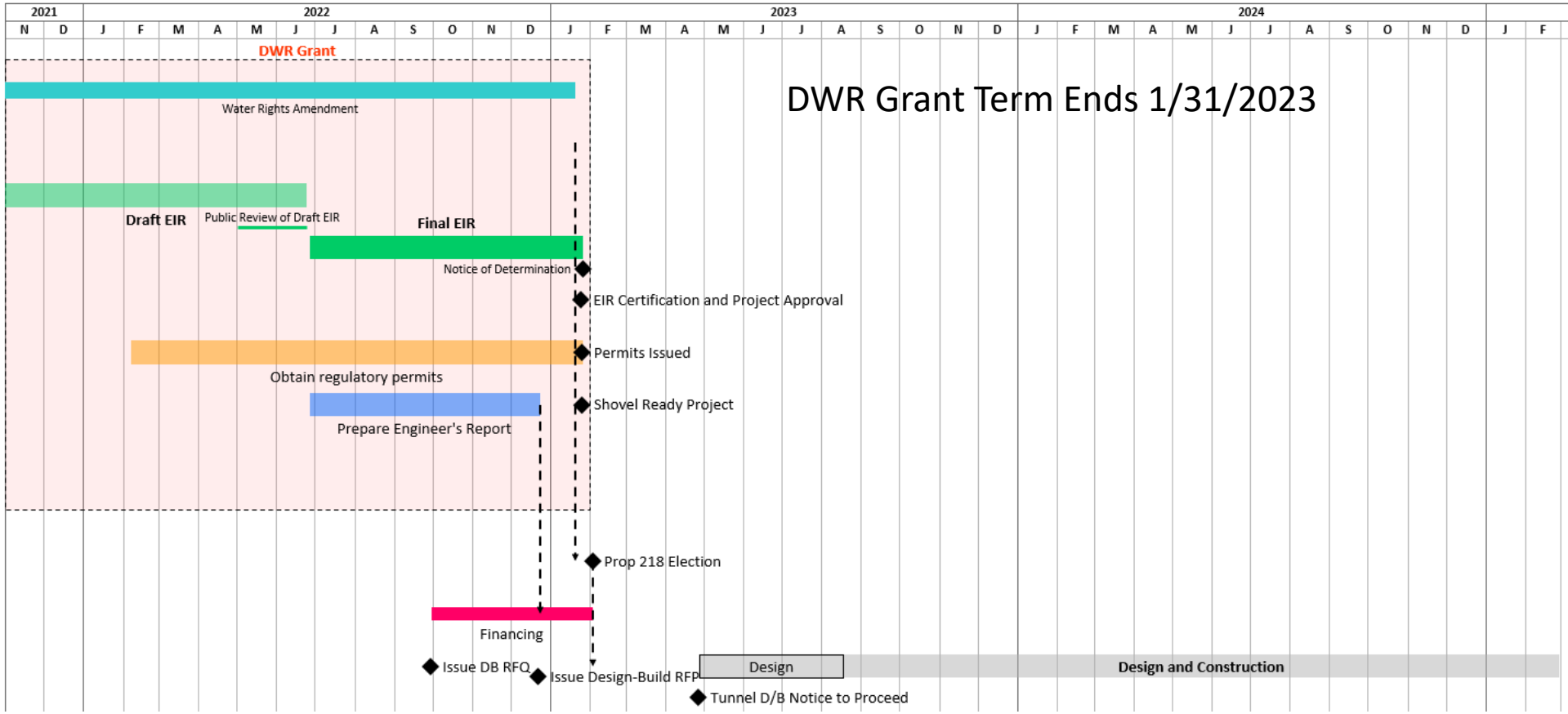
* Each metric individually measures cost of full debt service

Value of increased water benefits (various metrics)

Annual Value of Water per AFY	$/AFY*
Average conservation release (new conservation release)	**$995**
Reduced flood control releases	**$840**
Dry year increase in groundwater recharge	**$297**
Increased storage	**$268**

Greatest benefit is increased storage at $268 per AF per year

Schedule forecast



Next Steps

- Stay the course to complete the EIR
- Present the model findings and project benefits to the stakeholders and GSA
- Decide to incorporate spillway raise and spillway repairs with the tunnel project
- Prepare regulatory permit applications and begin consultations
- Prepare the Engineer's Report for Prop 218 financing
- Seek State and Federal grant funding for shovel ready project
- Prepare bid documents for:
  - Tunnel – Design Build
  - Spillway modifications – Design Bid Build

Questions