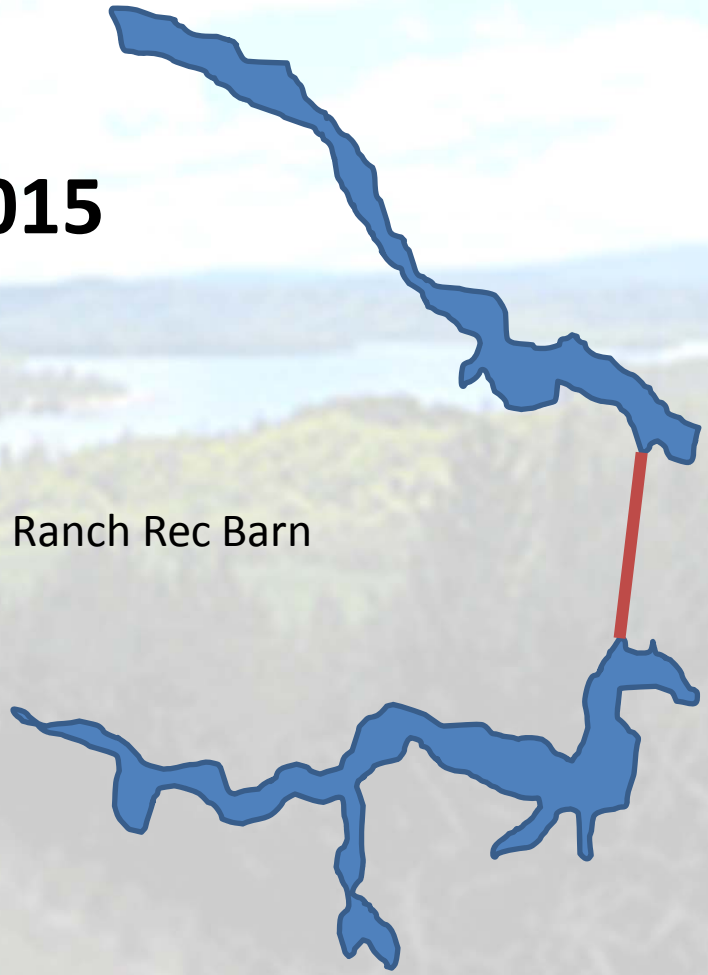
Interlake Tunnel Project

February 26,2015

Updated 3/19/15

Presentation at the Heritage Ranch Rec Barn



Agenda

- Introductions
- Project description and background
- Feasibility and hydraulic modeling
- San Antonio spillway modification description
- Environmental clearance and permitting
- Development schedule
- Cost and financing plan
- Questions and Answers

PROJECT BACKGROUND, DESCRIPTION AND FUNCTION

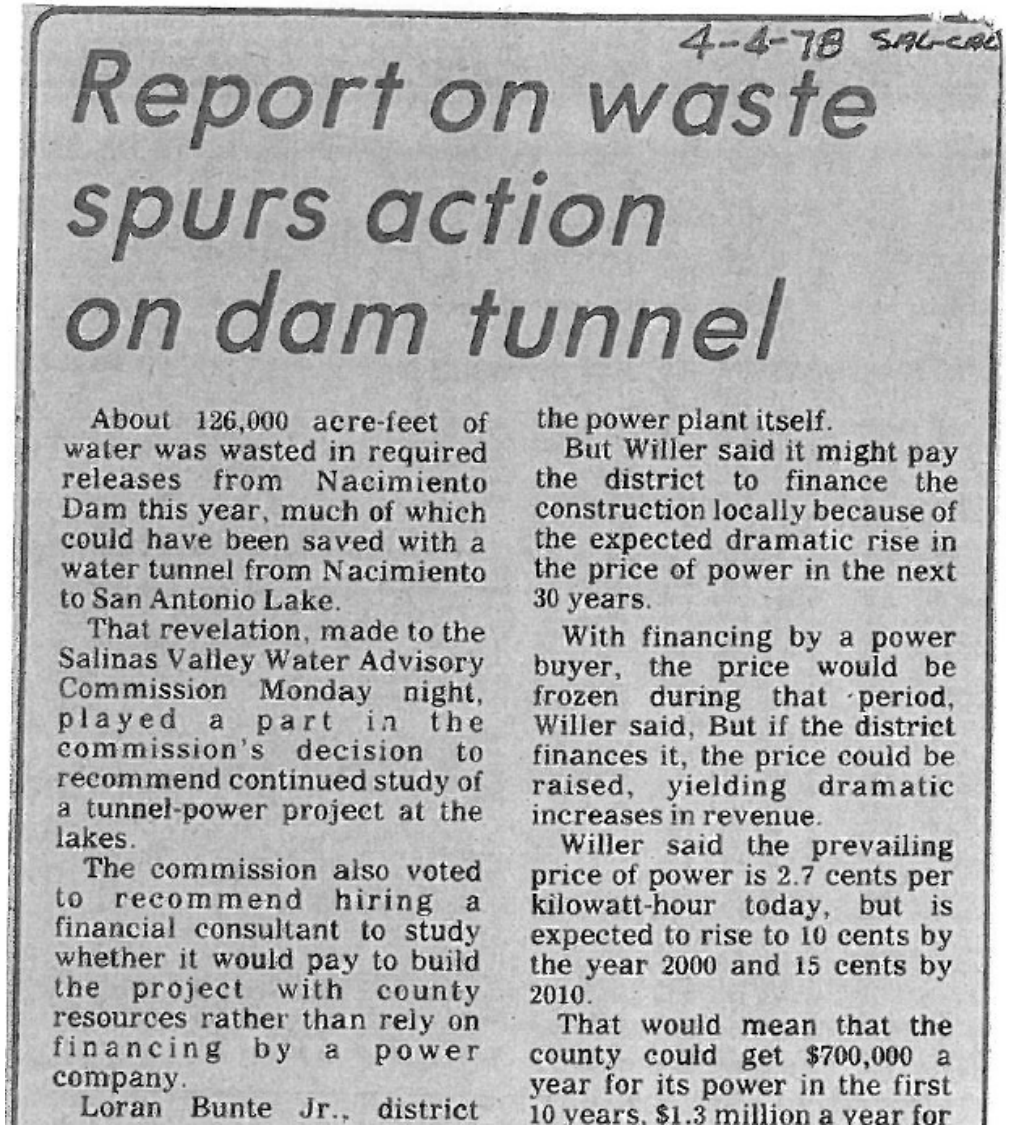
Existing Surface Water Supply for Salinas Valley properties

2 reservoirs, Salinas River, and Salinas River Diversion Facility

Description	Average Annual Amounts (AFY)
Average annual controlled release from reservoirs (baseline)	200,000
Less Evapotranspiration & Conveyance losses	-40,000
SRDF deliveries	-6,000
Ground water recharge	154,000

Provides flood control, minimum flows, and conservation releases

Tunnel has 37 year history from 1978



4-4-78 SAL-CAL

Report on waste spurs action on dam tunnel

About 126,000 acre-feet of water was wasted in required releases from Nacimiento Dam this year, much of which could have been saved with a water tunnel from Nacimiento to San Antonio Lake.

That revelation, made to the Salinas Valley Water Advisory Commission Monday night, played a part in the commission's decision to recommend continued study of a tunnel-power project at the lakes.

The commission also voted to recommend hiring a financial consultant to study whether it would pay to build the project with county resources rather than rely on financing by a power company.

Loran Bunte Jr., district

the power plant itself.

But Willer said it might pay the district to finance the construction locally because of the expected dramatic rise in the price of power in the next 30 years.

With financing by a power buyer, the price would be frozen during that period, Willer said, But if the district finances it, the price could be raised, yielding dramatic increases in revenue.

Willer said the prevailing price of power is 2.7 cents per kilowatt-hour today, but is expected to rise to 10 cents by the year 2000 and 15 cents by 2010.

That would mean that the county could get $700,000 a year for its power in the first 10 years, $1.3 million a year for

Nacimiento Lake's capacity is 350,000 acre-feet, but the top 150,000 acre-feet is set aside for flood control, requiring releases when the level goes above 200,000 acre-feet during flood season.

Bunte said that 50,000 acre-feet could have been saved by releasing it into San Antonio with a gravity flow nine-foot diameter tunnel.

1991 Analysis

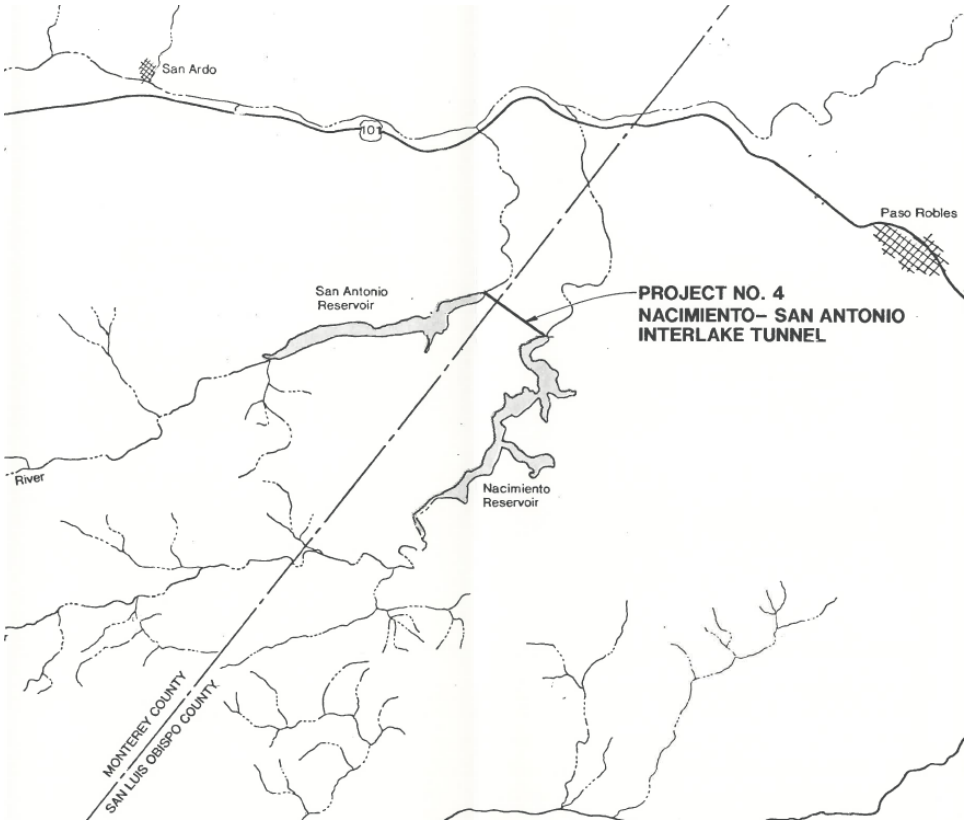
MONTEREY COUNTY
WATER RESOURCES AGENCY

WATER CAPITAL FACILITIES PLAN

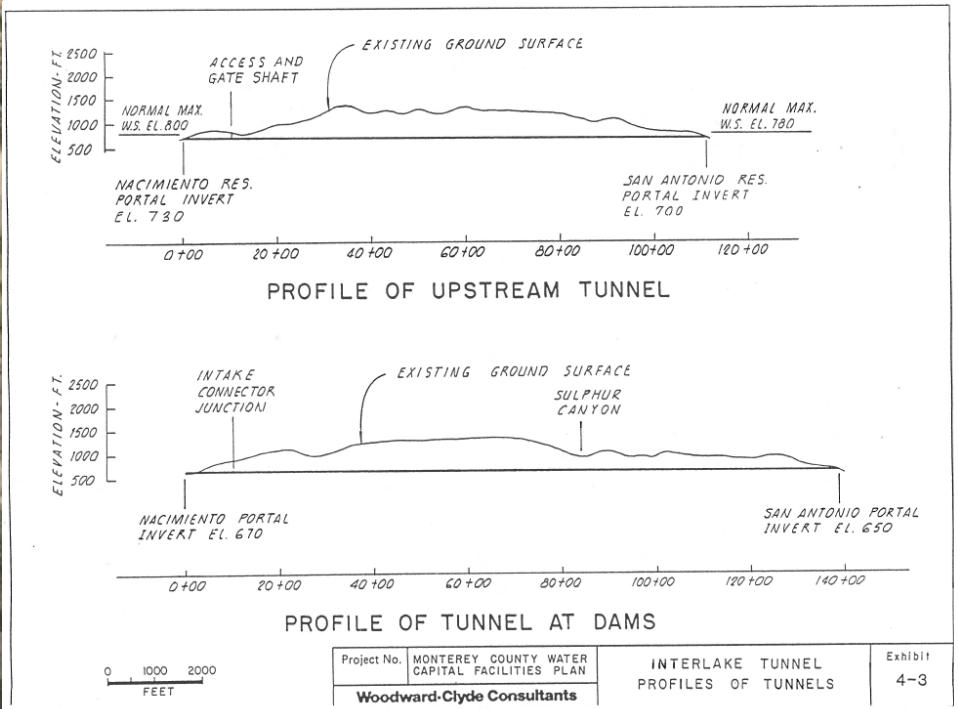
JULY 1991

VOLUME I REPORT

BOYLE ENGINEERING CORPORATION

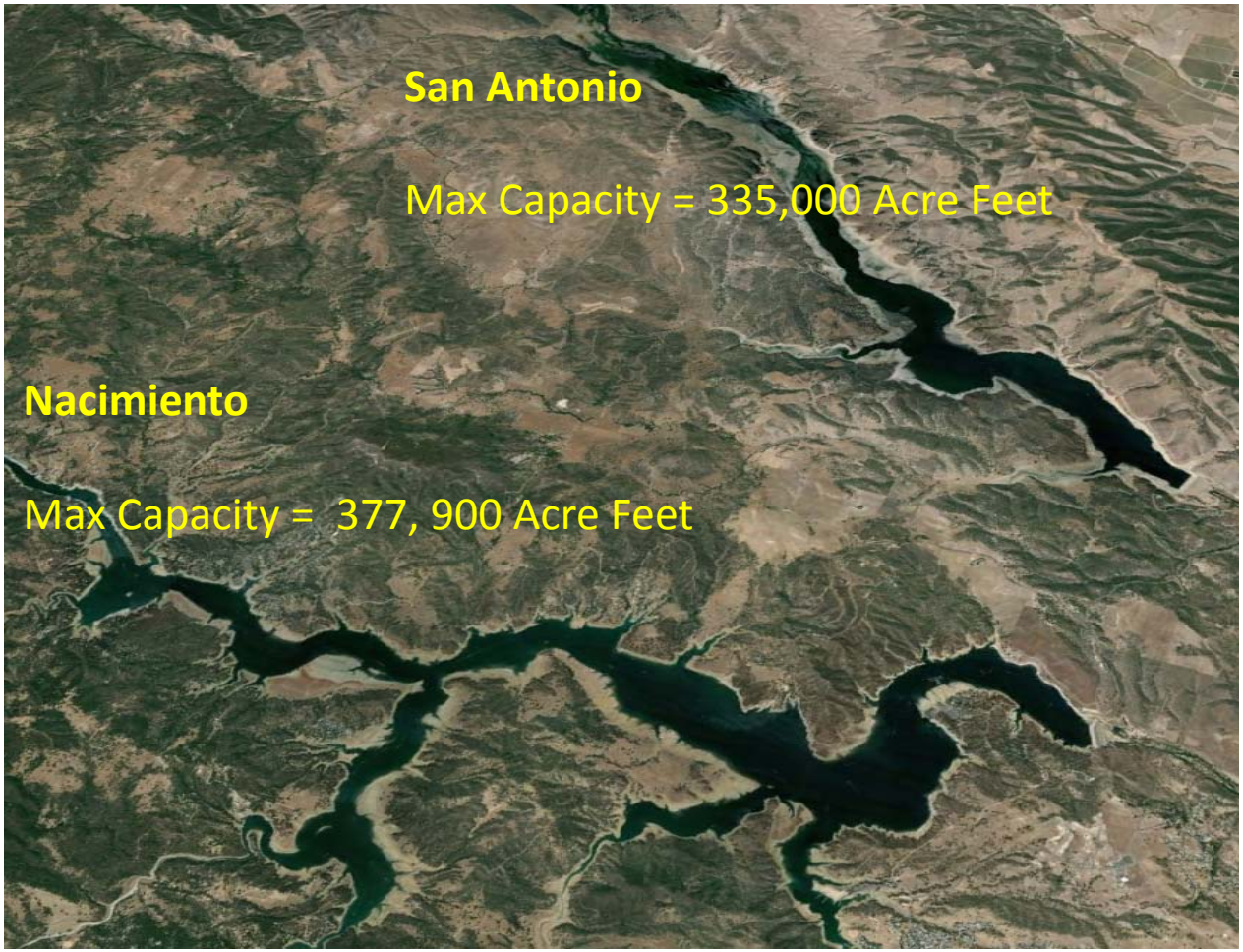


1991 tunnel studies



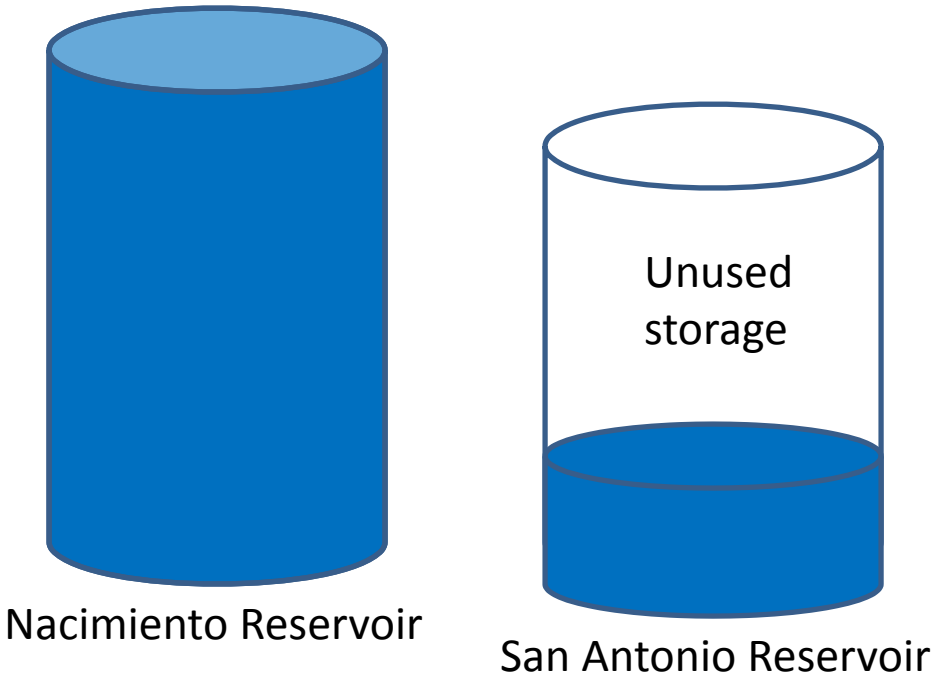
Reservoirs Features

Nacimiento fills 3X faster than San Antonio



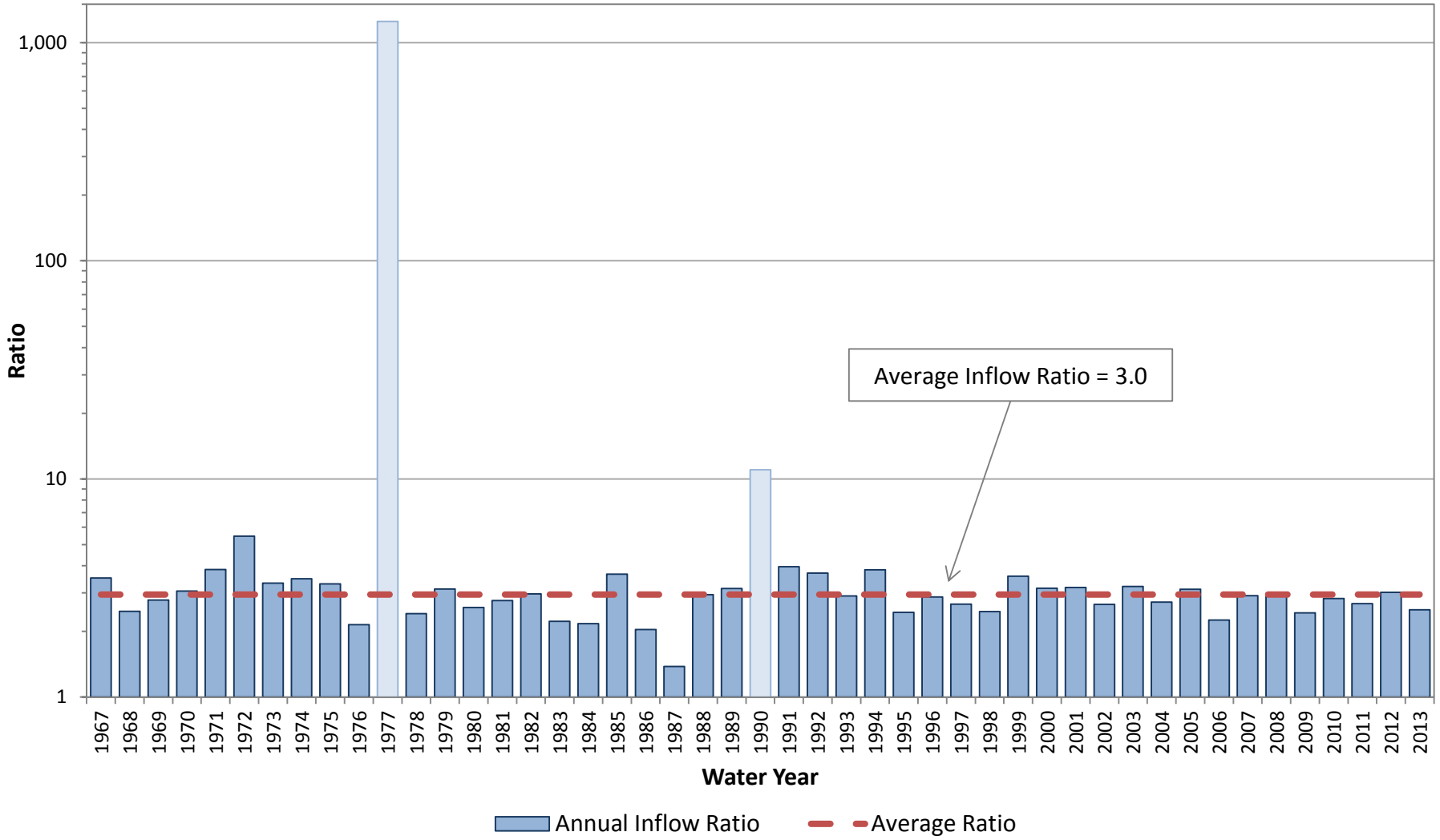
Item	Nacimiento Reservoir	San Antonio Reservoir
Watershed Area (square miles)	322	353
Normal Maximum Storage (acre-feet)	377,900	335,000
Spillway	Overflow Weir and Chute, Obermeyer Gate Control	Fixed Crest Overflow Weir and Chute
Spillway Crest Elevation (ft)	800.00 Gate "closed" 787.75 Gate "opened"	780.00

Current Situation at Reservoirs



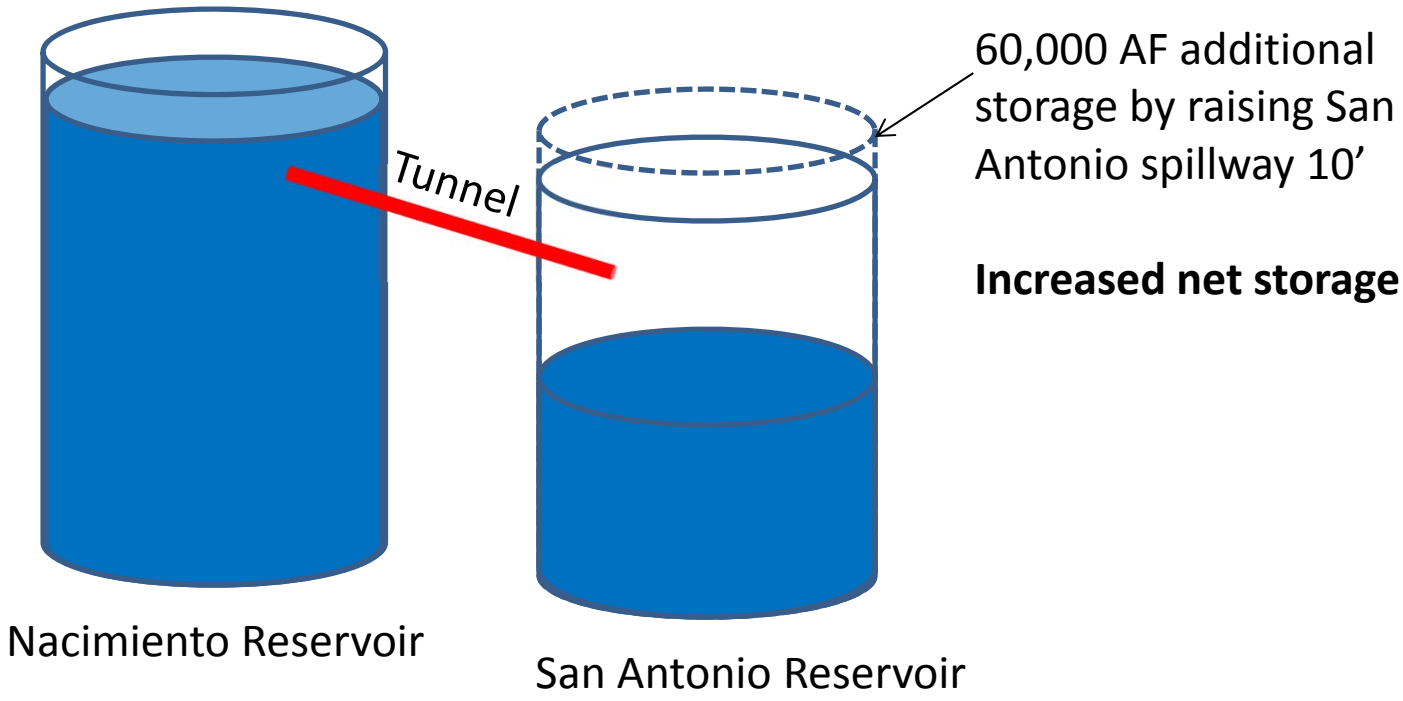
- Nacimiento fills 3 x faster than San Antonio
- San Antonio has unused storage
- **Excess water spilled to ocean**

Ratio of Calculated Annual Inflow - Nacimiento over San Antonio (Water Years 1967-2013)



Inflow ratios from WY 1977 and WY 1990 were omitted from the average ratio as outliers due to inconsistency with the long term trend. WY 1977 and WY 1990 were the lowest inflow years on record at San Antonio and do not represent typical inflow ratios.

Tunnel Project Fundamentals

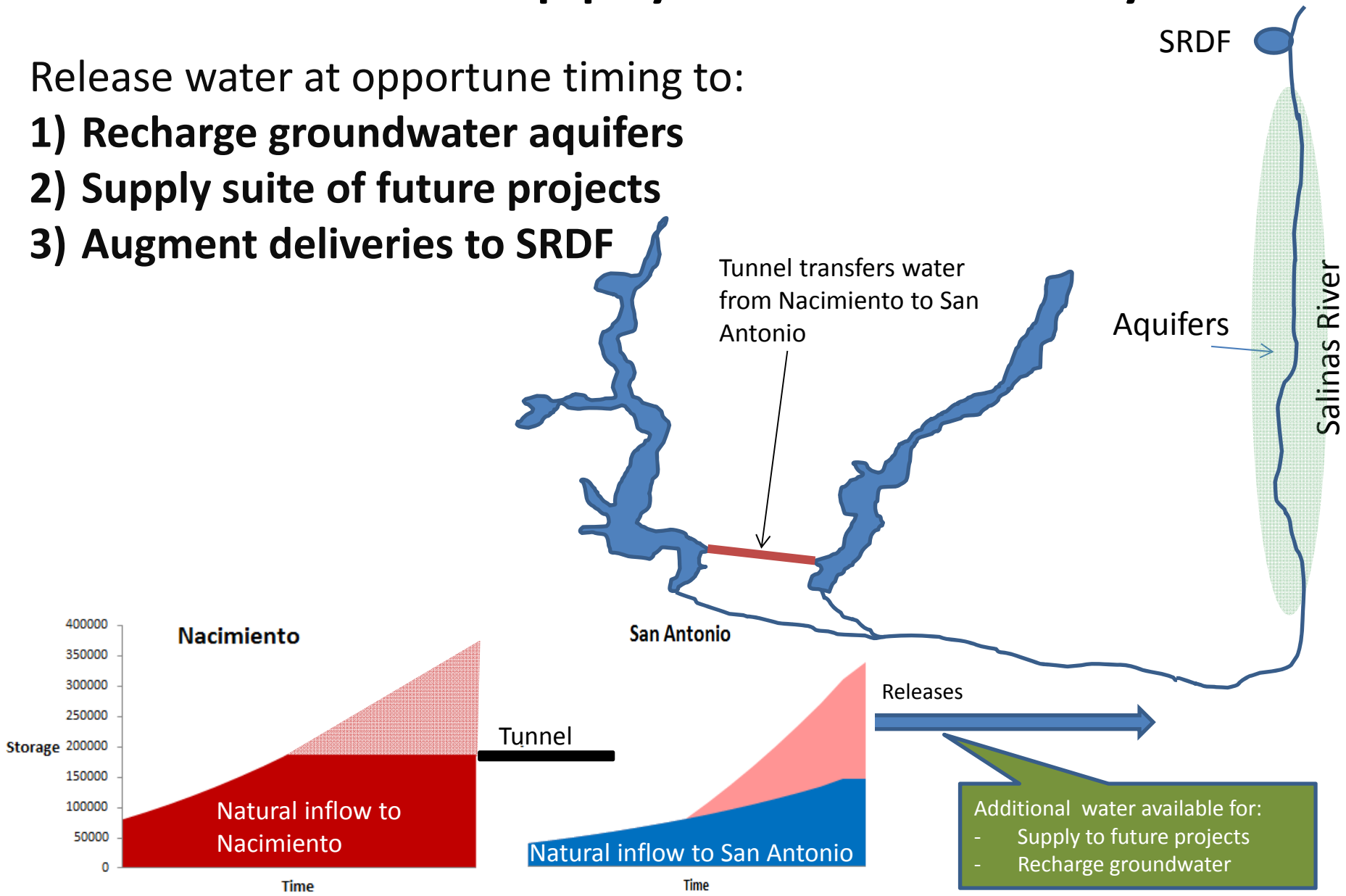


Increases net storage of reservoirs
provides flood control and reduces flood spills

Water supply sustainability

Release water at opportune timing to:

1) **Recharge groundwater aquifers**
2) **Supply suite of future projects**
3) **Augment deliveries to SRDF**



Interlake Tunnel

Portals and Tunnel Profile

(conceptual)

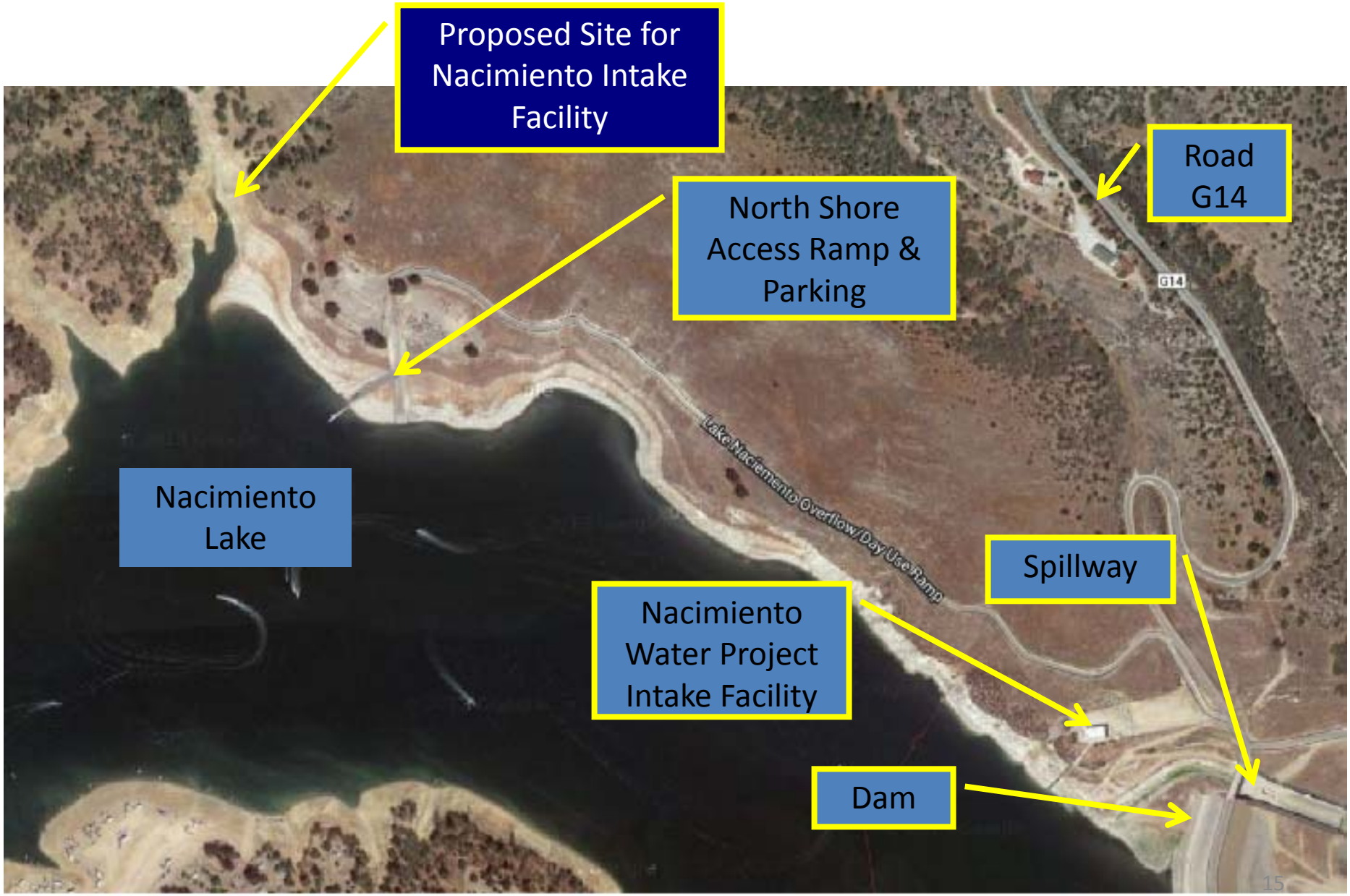
Nacimiento portal

Portal Invert Elevation (~745’)
Spillway elevation ~ 800’

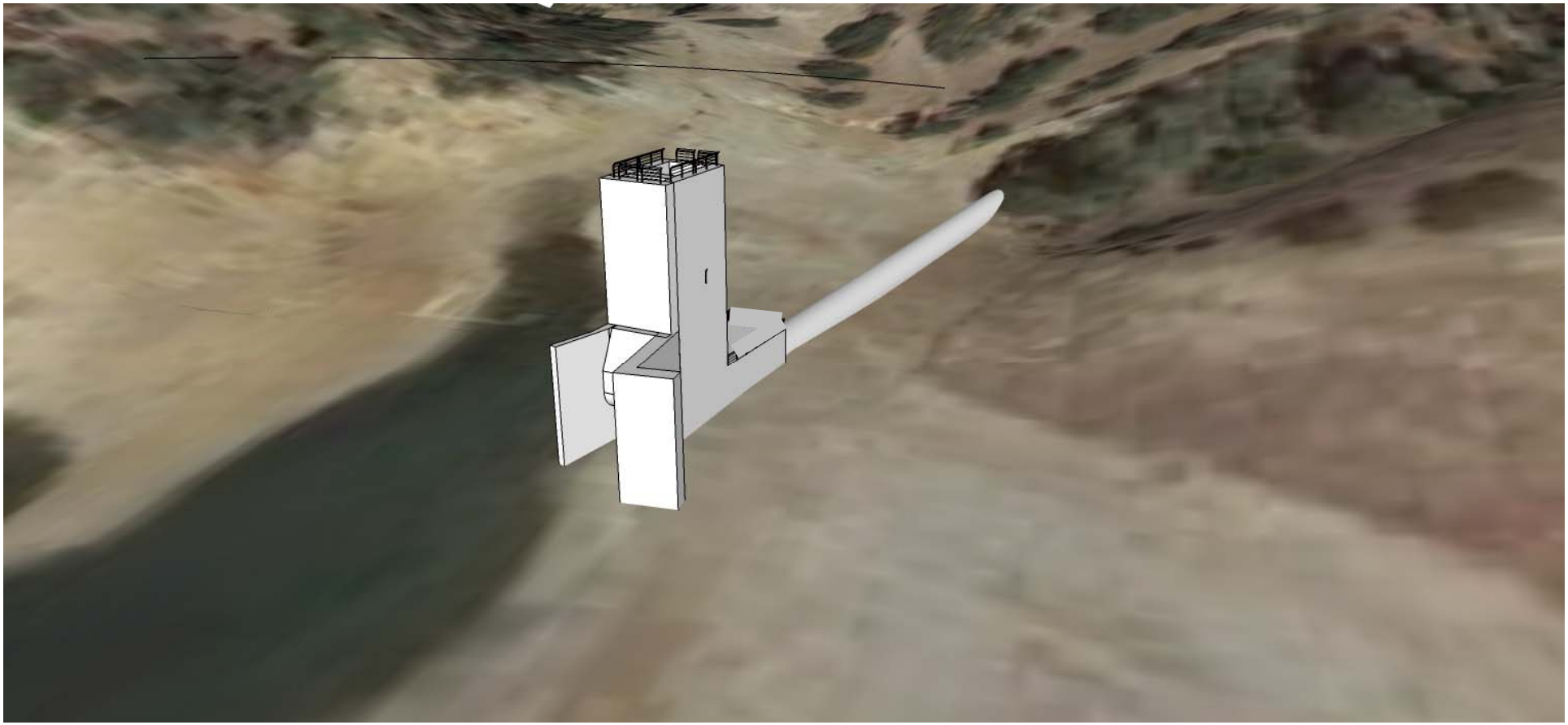
San Antonio portal

Portal Invert Elevation (~695')
Spillway elevation ~ 780’

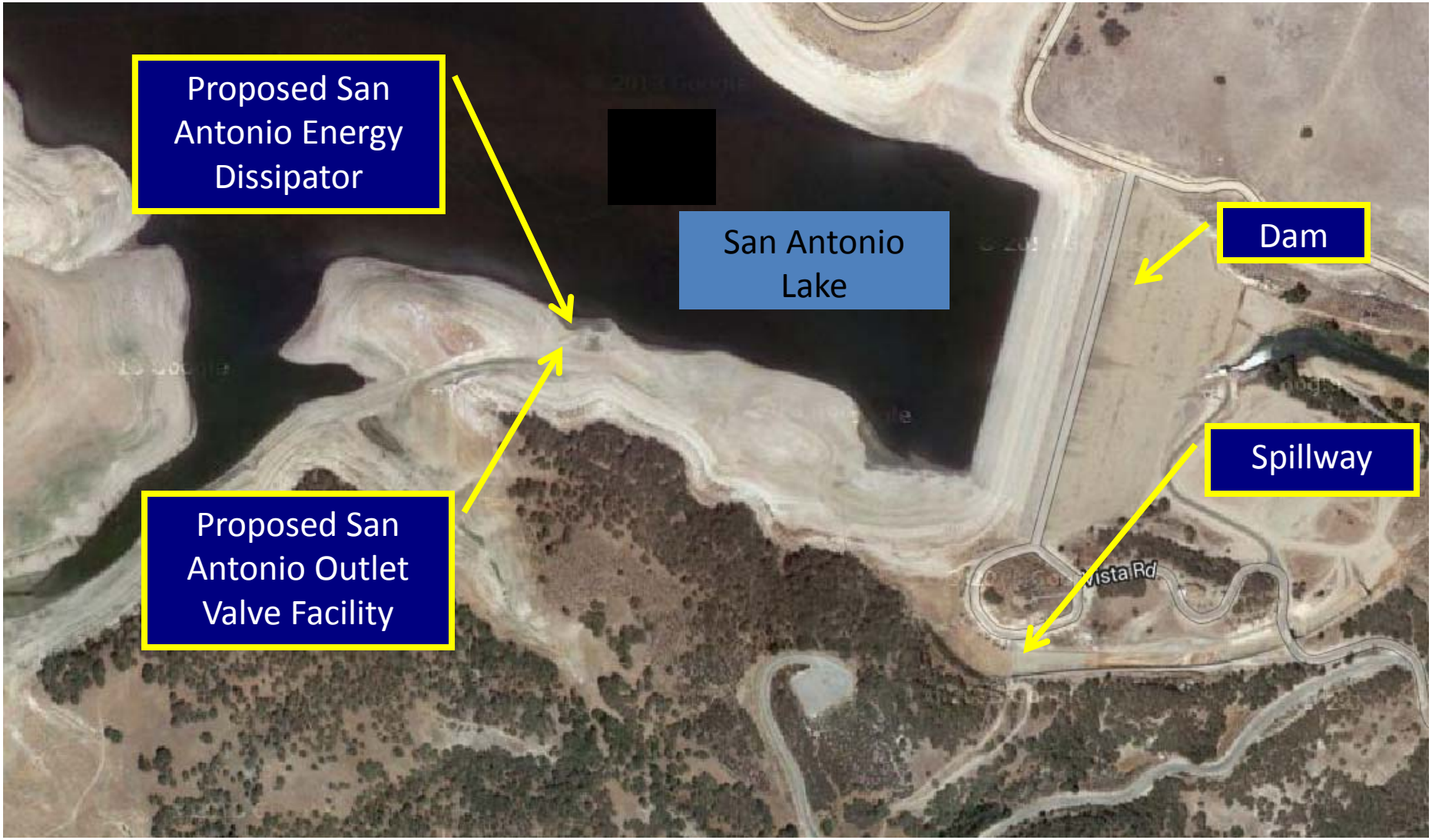
Nacimiento proposed intake



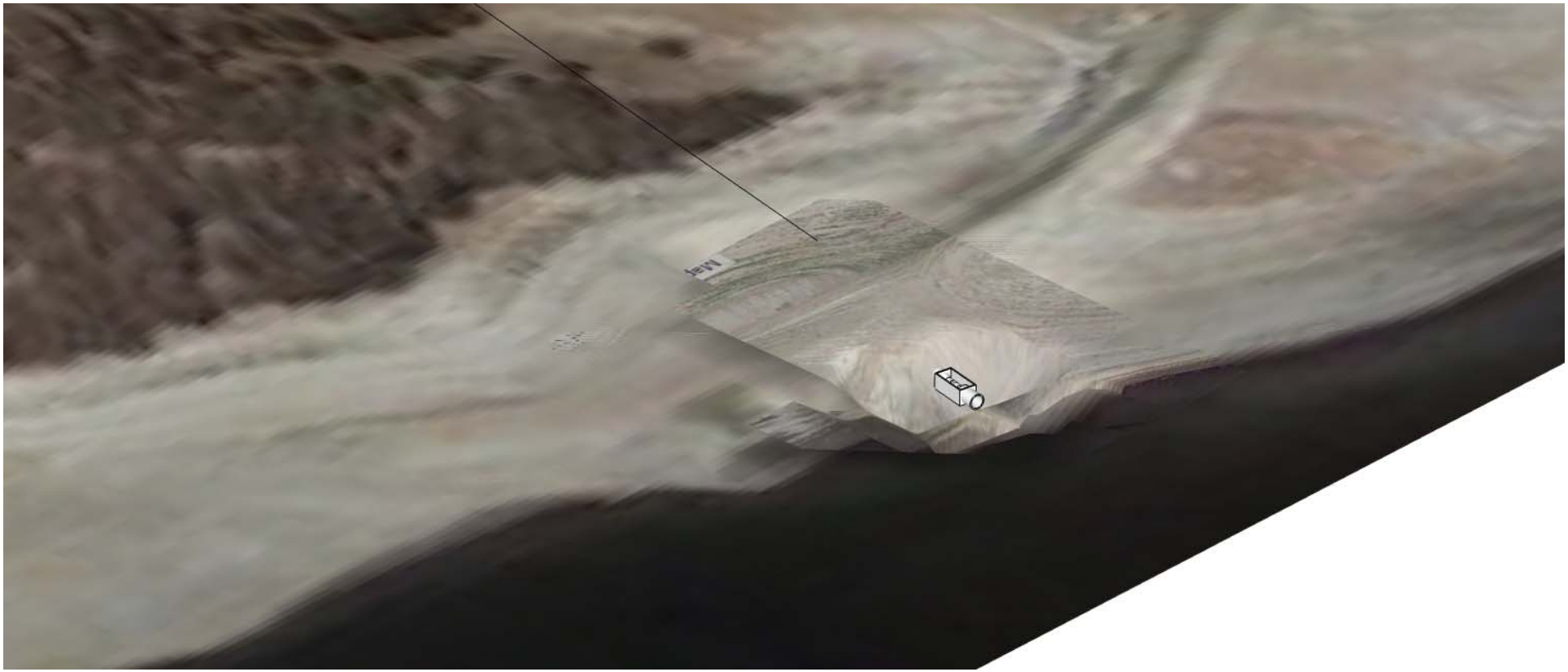
Nacimiento intake structure concept



San Antonio Hydraulic Structures

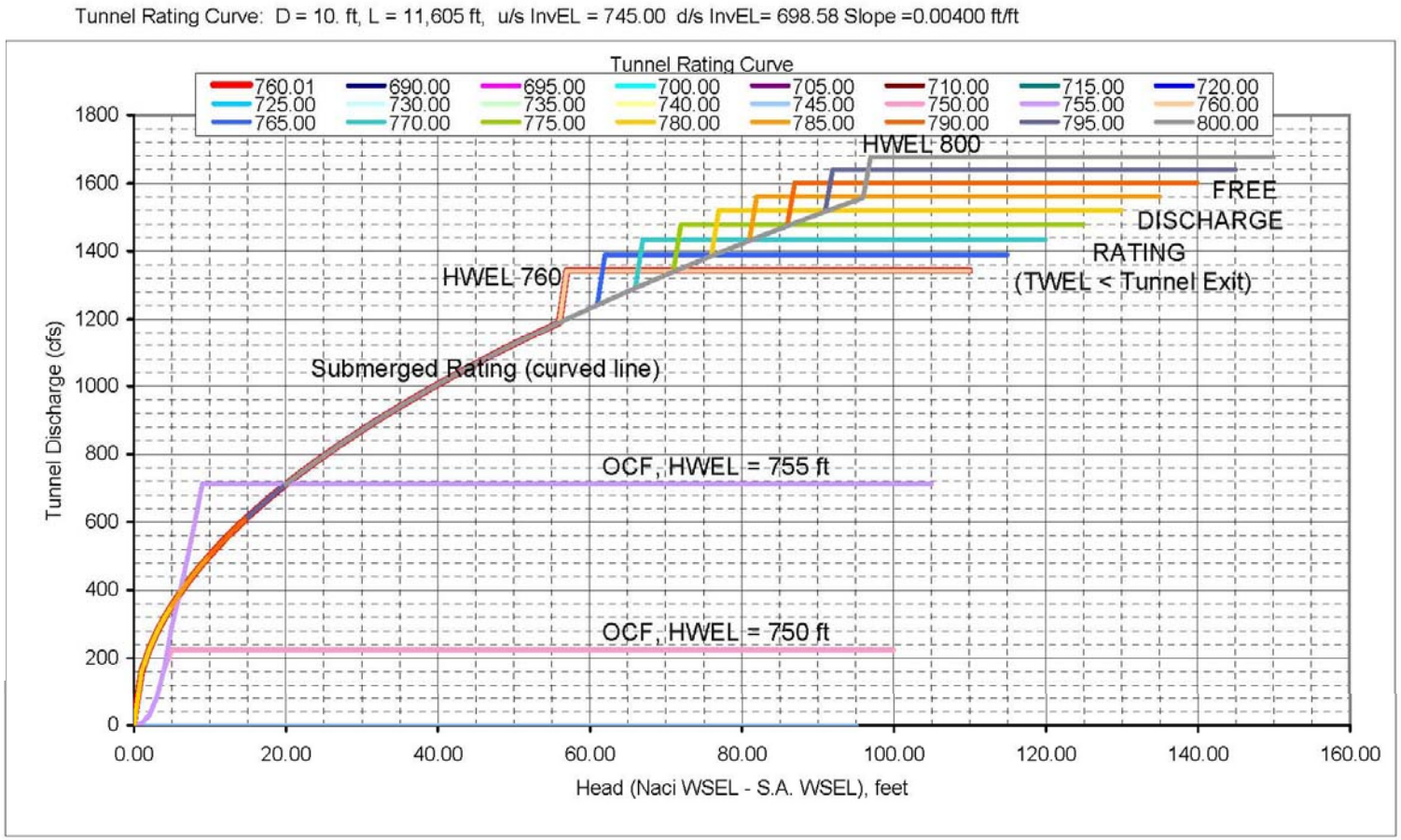


San Antonio outlet concept



Tunnel rating curve

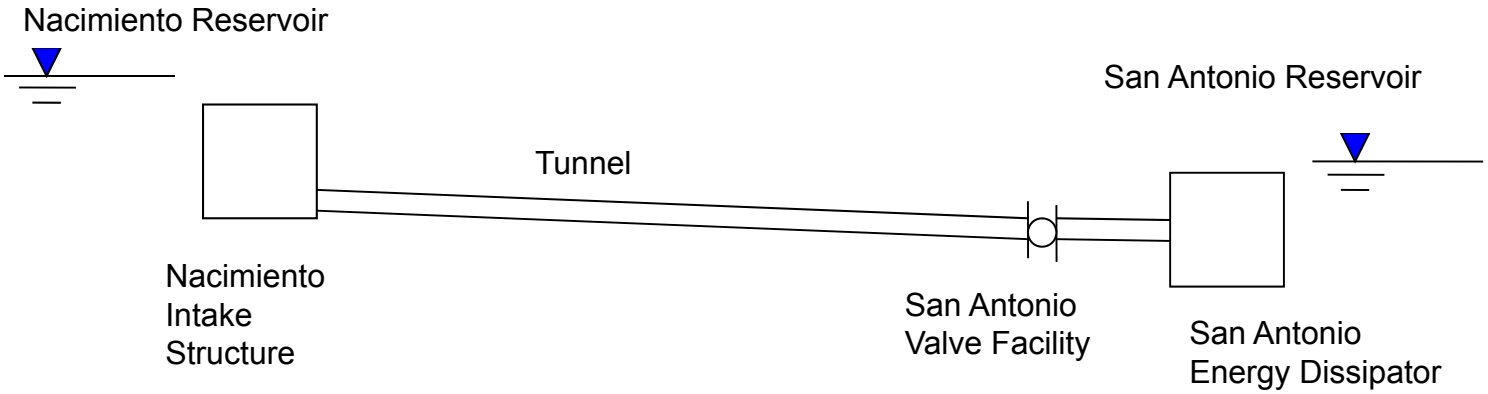
Daily Volume
AF/Day
3,570
3,174
2,777
2,380
1,983
1,587
1,190
793
397

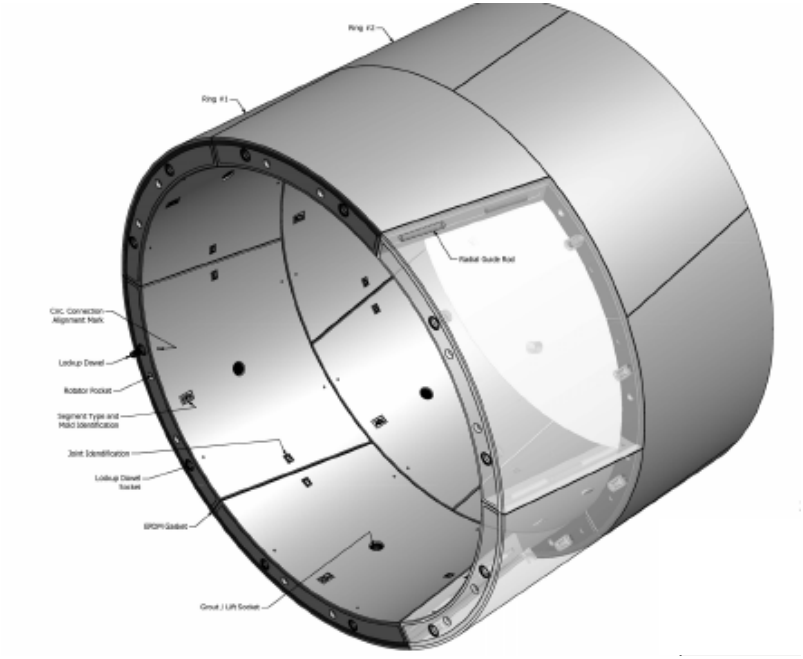


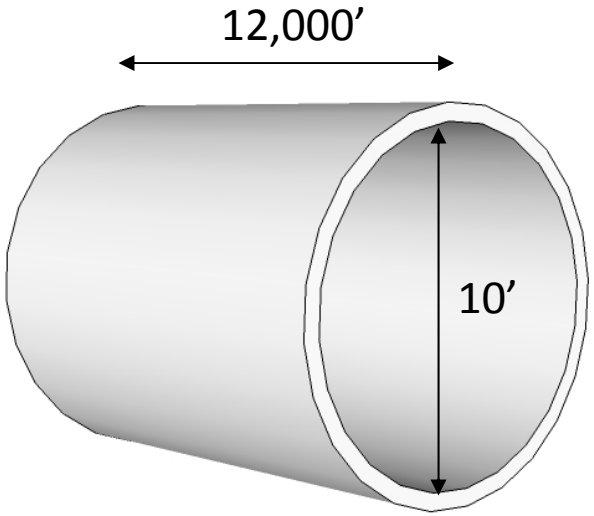
OCF = Open Channel Flow
HWEL = Headwater Elevation (Nacimiento)
WSEL = Water Surface Elevation
TWEL = Tailwater Elevation (San Antonio)

Technical Memorandum HC.02, REV00 (DRAFT)
Figure 13. Revised Interlake Tunnel Rating Curve

Tunnel concept







Tunnel maximum flow capacity ~ 1,700 CFS

Hydraulics Operation Criteria & Assumptions

- Slope: 0.004 ft/ft
  - Selected at initial stage of evaluation to parallel the friction slope, S_f; thus, Slope is about parallel to the water surface profile slope (hydraulic grade line)
  - Slope greater than minimum slope of 0.001ft/ft
  - Slope within range of other water tunnels
- Friction Loss Function: Darcy-Weisbach
  - Accounts for sidewall roughness, water viscosity, diameter, and length

(TM HC.01)

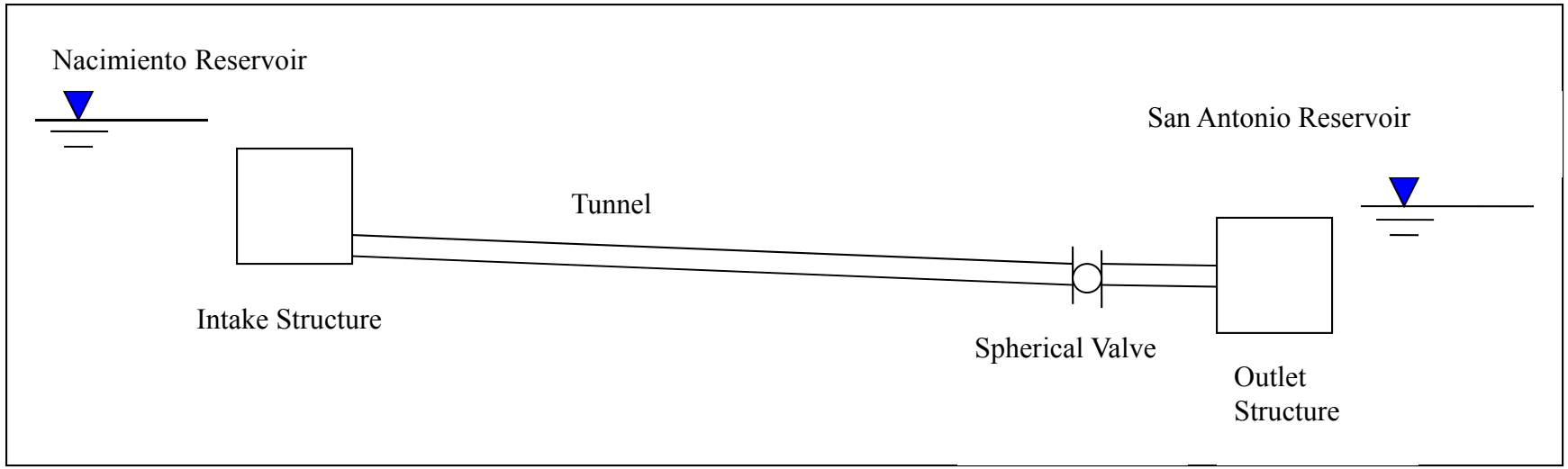
Hydraulics Operation Criteria & Assumptions

- Invert EL: 745.0 ft-NGVD29
  - Selected to correspond with water transfer trigger elevation of 760 ft in Lake Nacimiento
  - Crown of Intake Submerged
  - Tunnel will flow full if water surface profile is greater than tunnel crown
  - Final Designer to perform detailed water surface profile (HGL) computation to verify hydraulics, including slopes and elevations

(TM HC.01)

Hydraulics Operation Criteria & Assumptions

- Flow Control: Downstream Spherical Valve
  - d/s control allows tunnel to flow full

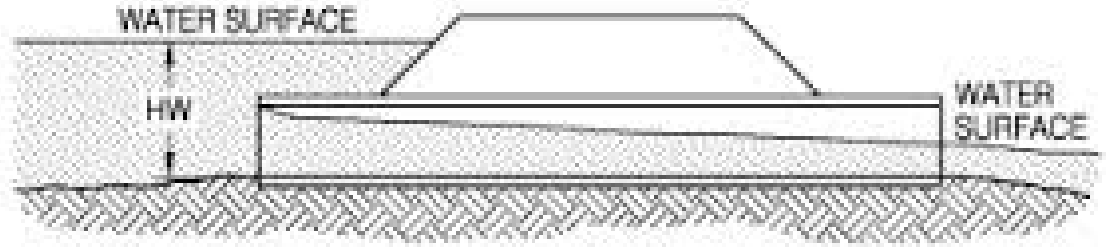


(TM HC.01)

Why is Flowing Full Important?

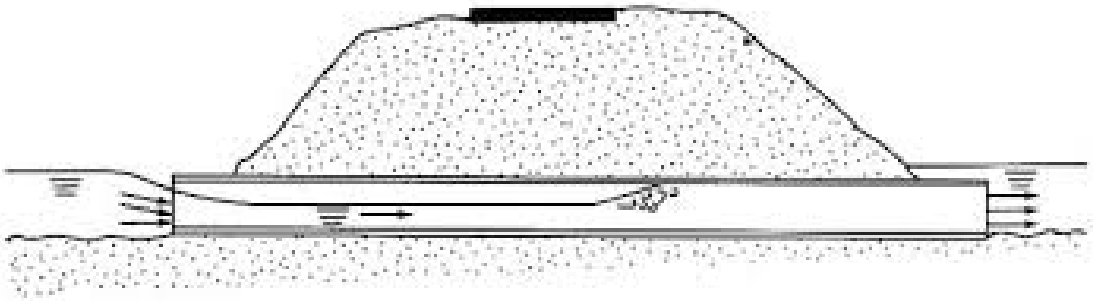
- Technical Life of Tunnel > 100 years
- Steady Flow Streamlines Improve Longevity
- Partial Flow Jeopardizes Longevity
- Partial Flow: Severe Dynamic Transitions

Why is Flowing Full Important?



This Condition is Acceptable When Tailwater Never Submerges Outlet

INLET CONTROL



This Condition Is Problematic in Long High Capacity Tunnel Configurations

Hydraulic Jump inside Stilling Basin

- Designed for Hyd. Jumps

- Tailwater Promotes Jump Stability Within Confines of Basin

Hydraulic Jump Inside Tunnel

- Not Designed for Hyd. Jump
- Tailwater Not Consistent
- Trapped Air Restricts Flow
- Jump Moves Around

Hydraulics Operation Criteria & Assumptions

- Flow Control
  - Spherical Valve: Allows for sealing with head on both side of valve, allows for partial open operation (can throttle flow), can tolerate high velocities, full-port opening.

(TM HC.01)

FEASIBILITY AND HYDRAULIC MODELING

Hydrologic model fundamentals

Water rights limitations:

- Each reservoir is operated within its water rights.
- Nacimiento has 17,500 afy consumptive demands

Water supply requirements:

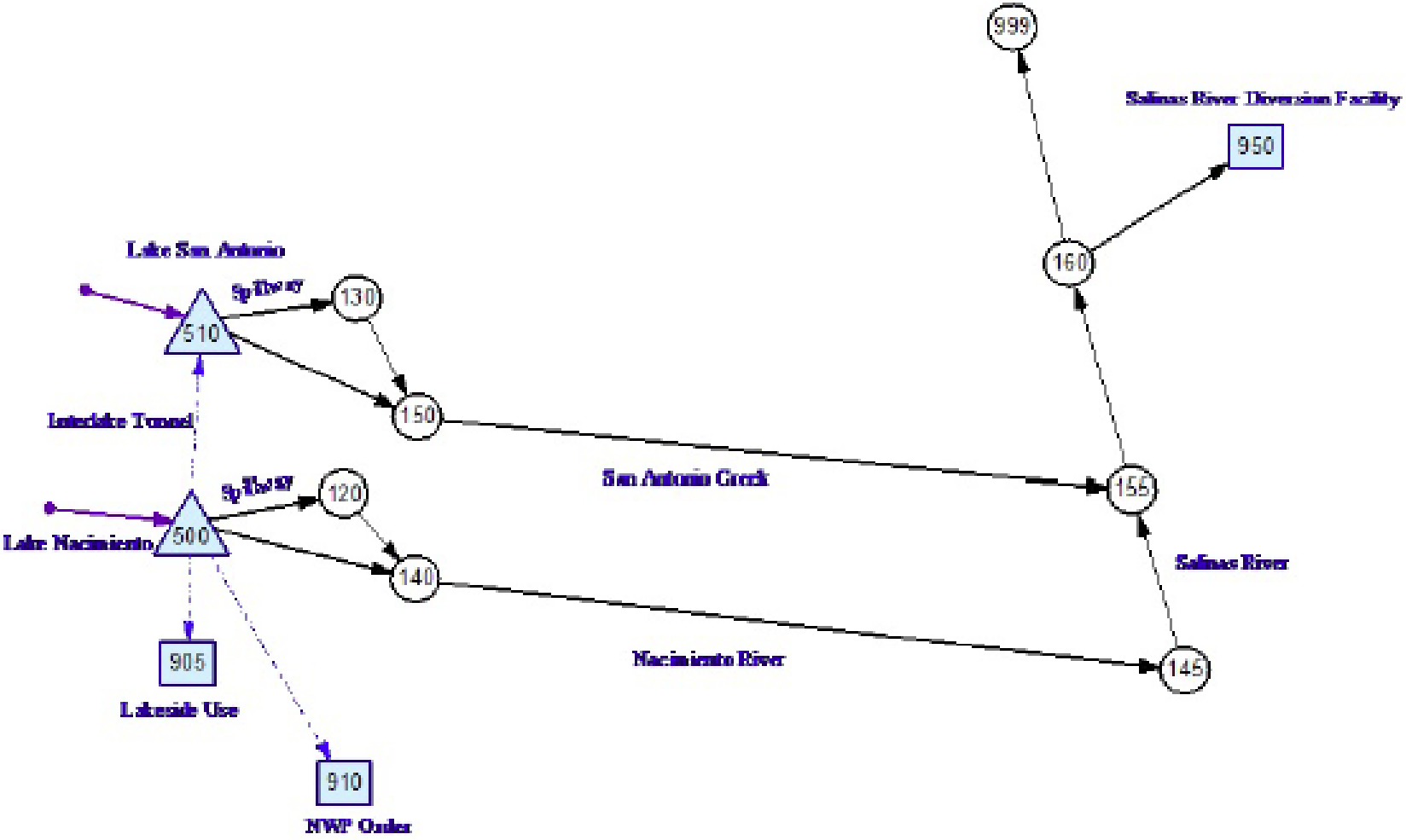
- Block flows are released when called for
- Minimum Flow Requirements are met from each reservoir.
- Reservoir Balancing to meet Salinas River Diversion Facility (SRDF) demands is achieved through:
  - releases from Nacimiento up to capacity of hydroelectric plant
  - remaining releases, if required, are made from San Antonio Reservoir.

Proposed tunnel operating concepts

- Operate on head relationships between inflow and outflow in a pressure flow mode.
- Water conveyance through tunnel when the Nacimiento surface water elevation is above 760 feet.
- No water conveyance through the tunnel when San Antonio is spilling.

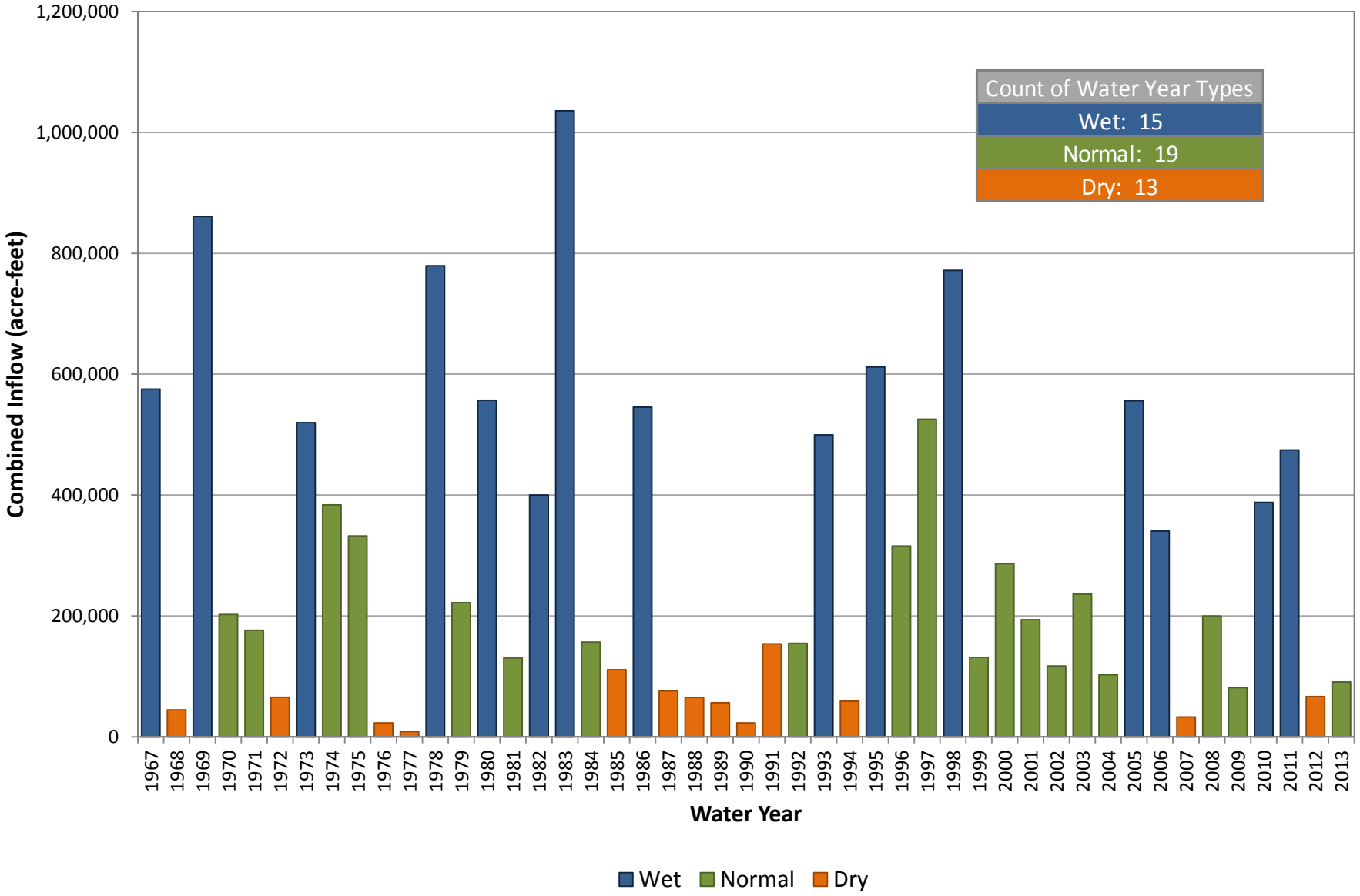
Hydrologic Modeling

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

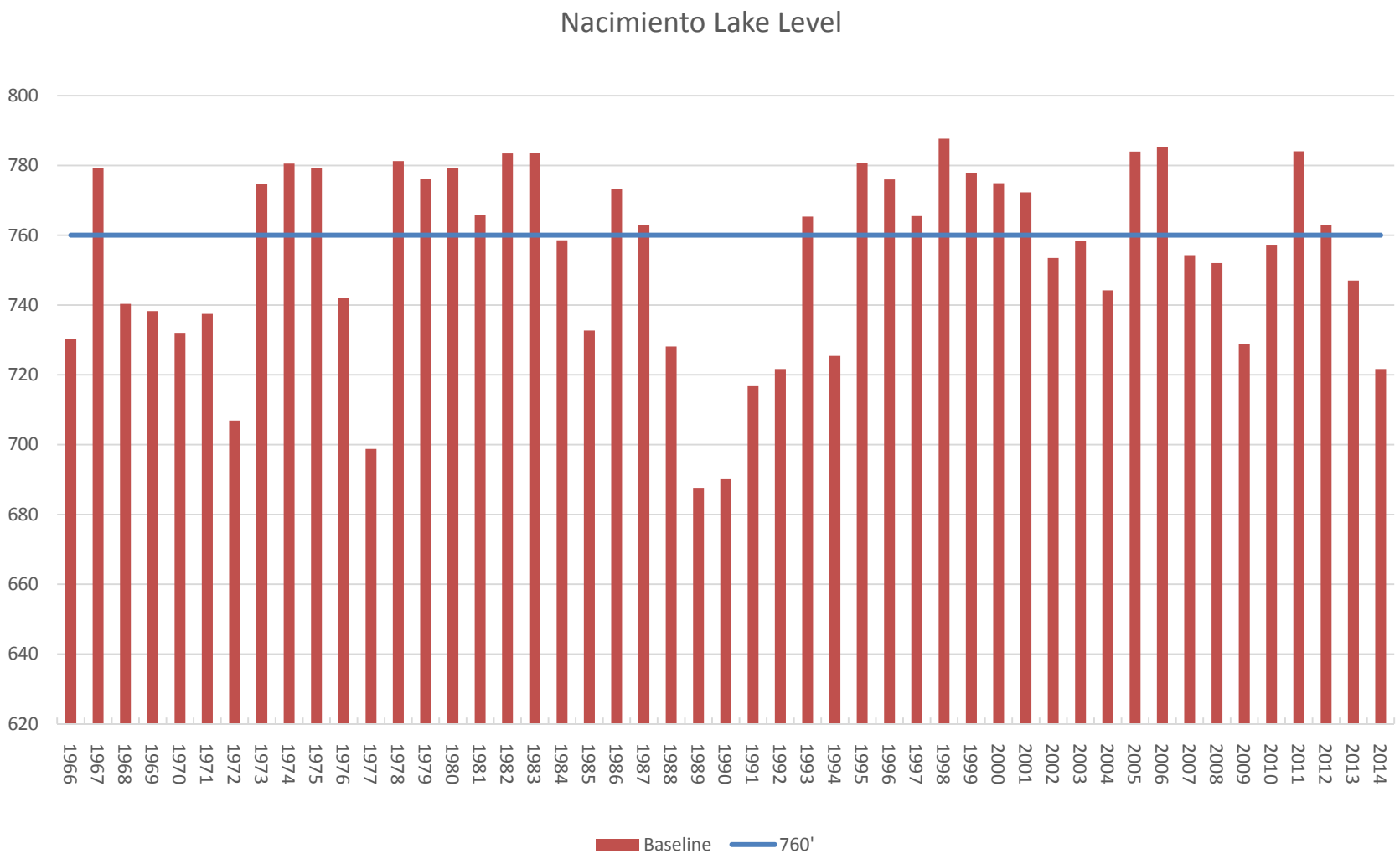


OASIS Computer Operational Simulation Model Schematic

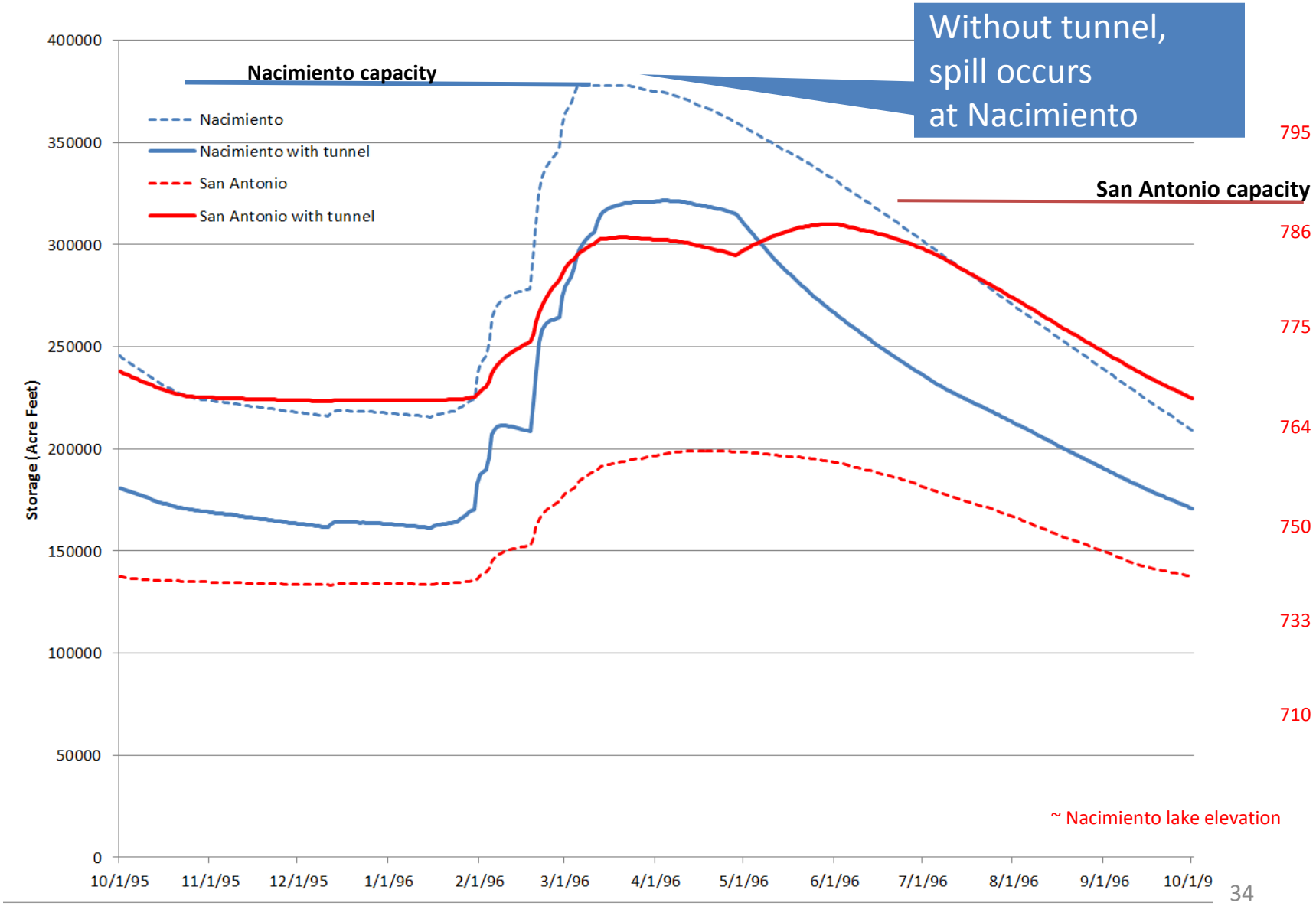
Combined Nacimiento and San Antonio Inflow by Water Year Type (Water Years 1967 - 2013)



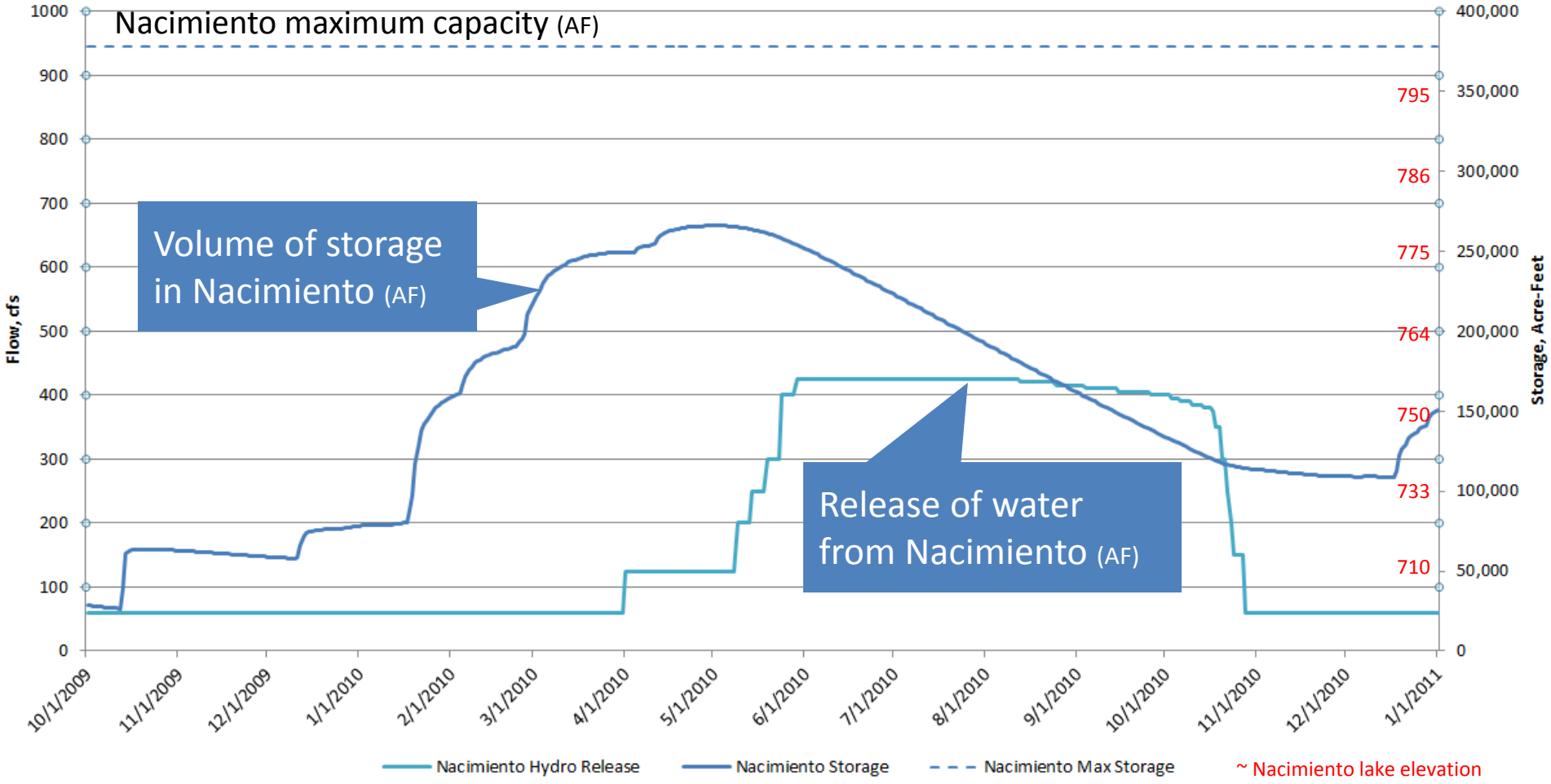
Nacimiento Lake elevation (annual average)



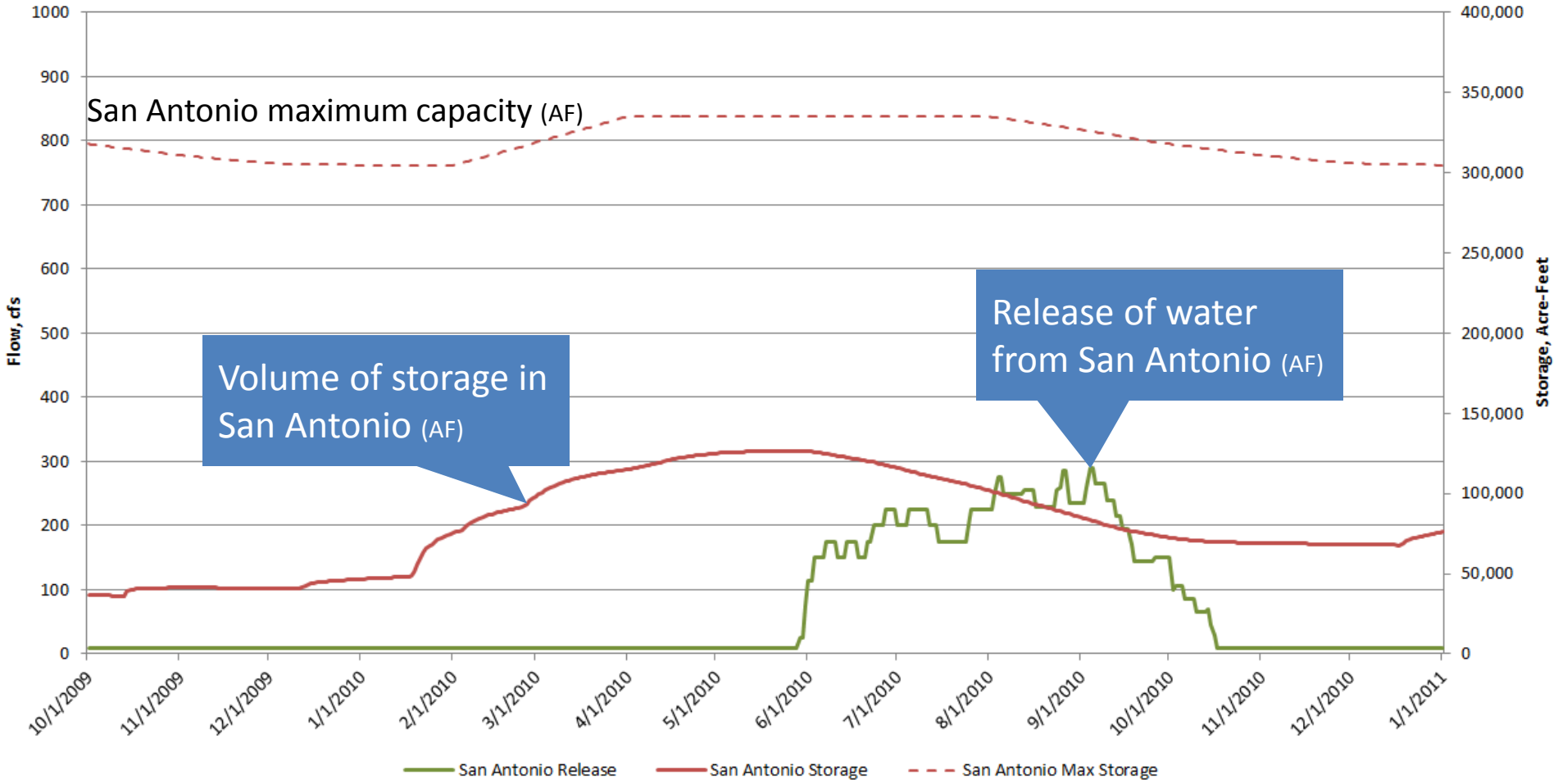
Tunnel Transfers Storage from Nacimiento to San Antonio



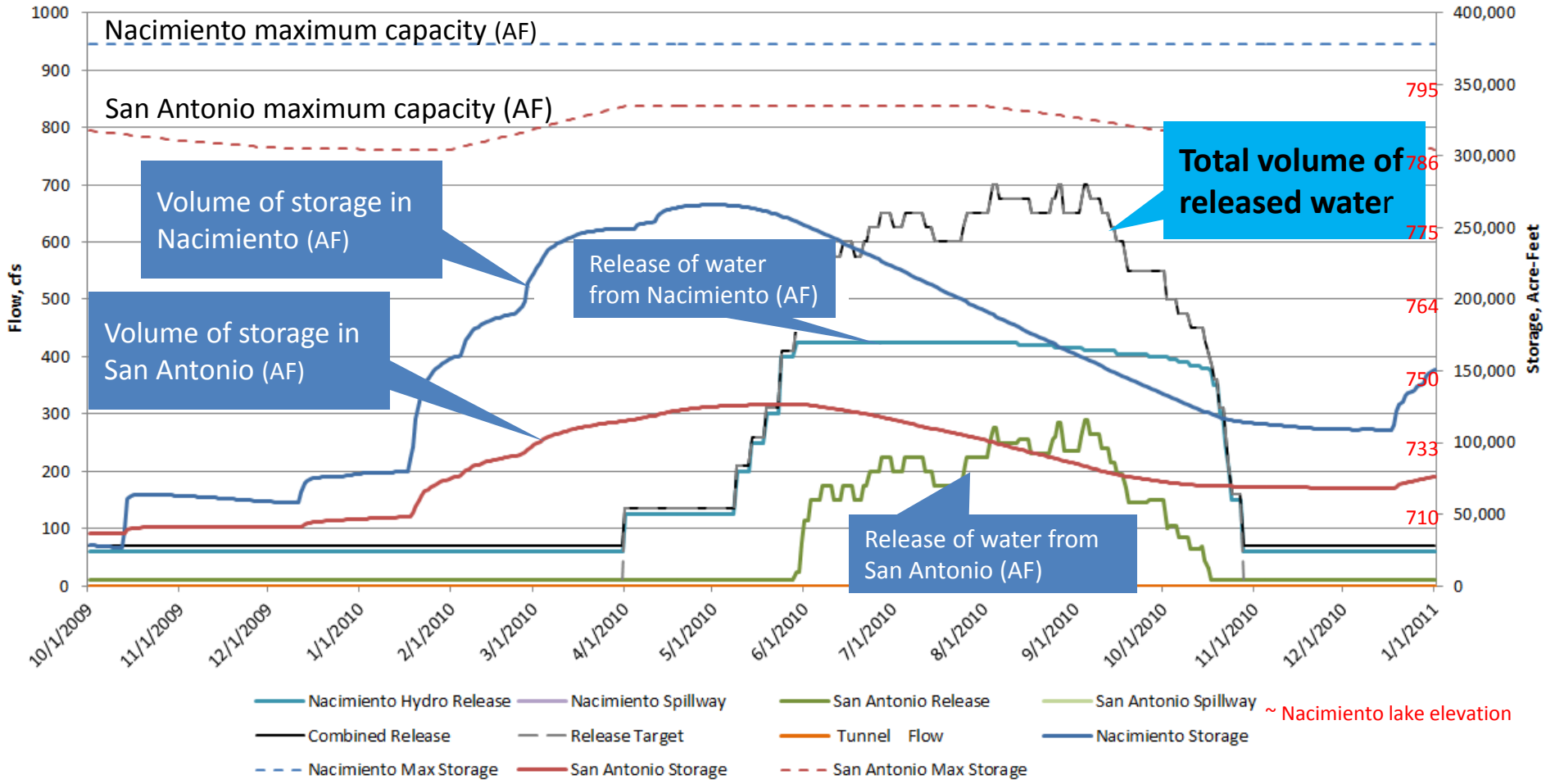
Hydrograph Explanation
Flow/Storage Over Time



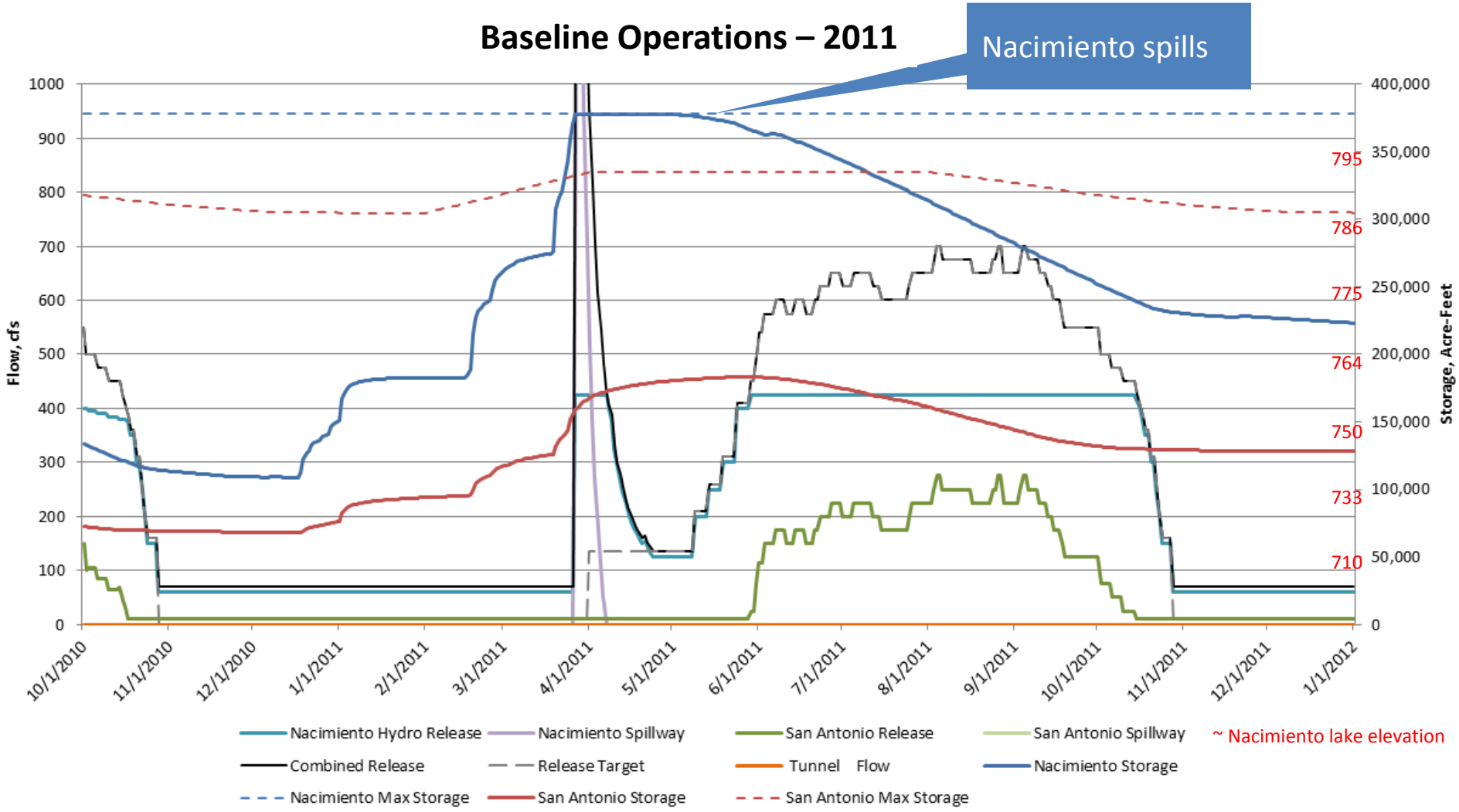
Hydrograph Explanation
Flow/Storage Over Time



Hydrograph Explanation
Combined Flow/Storage Over Time

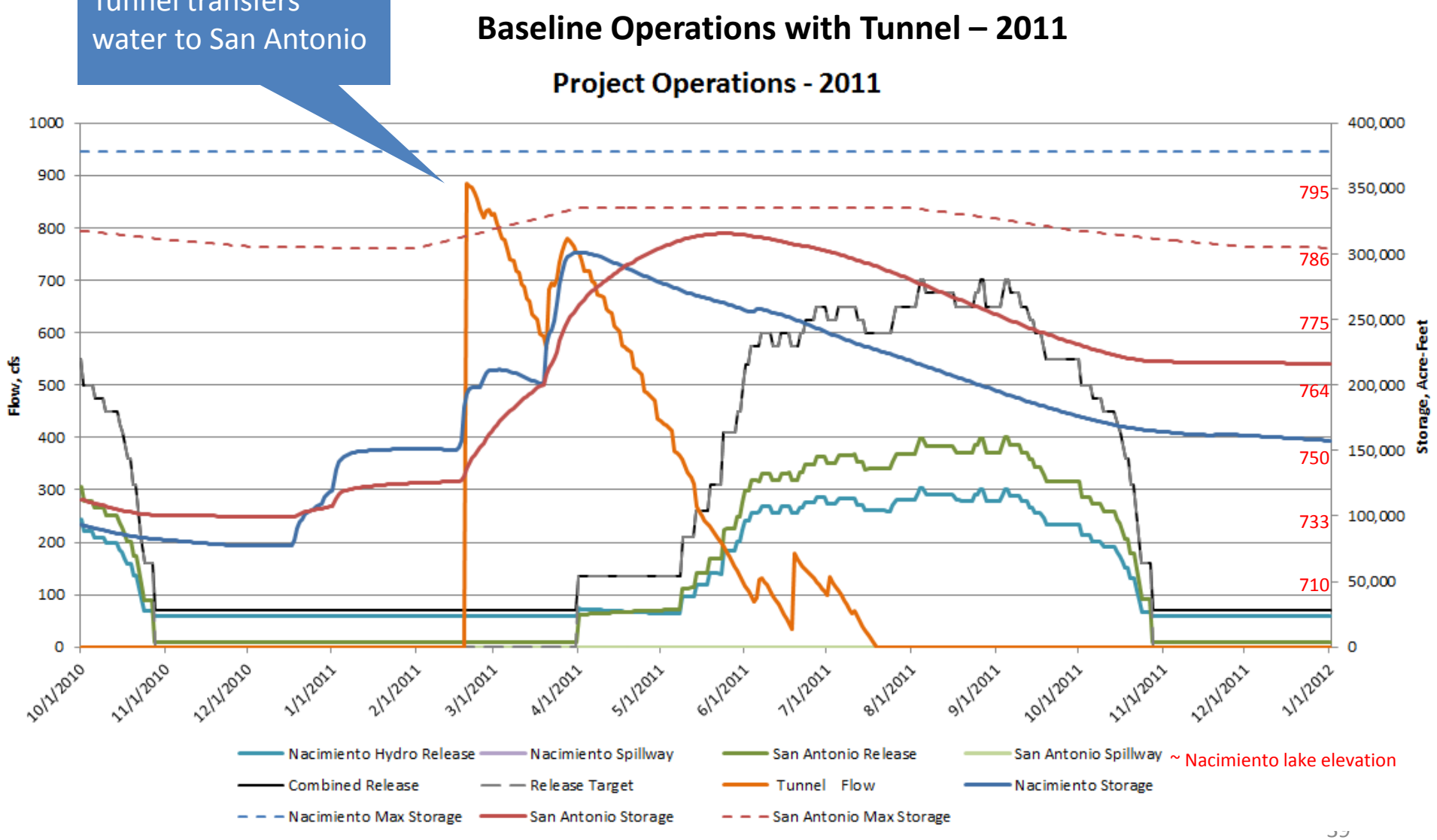


2011 – Baseline Operations

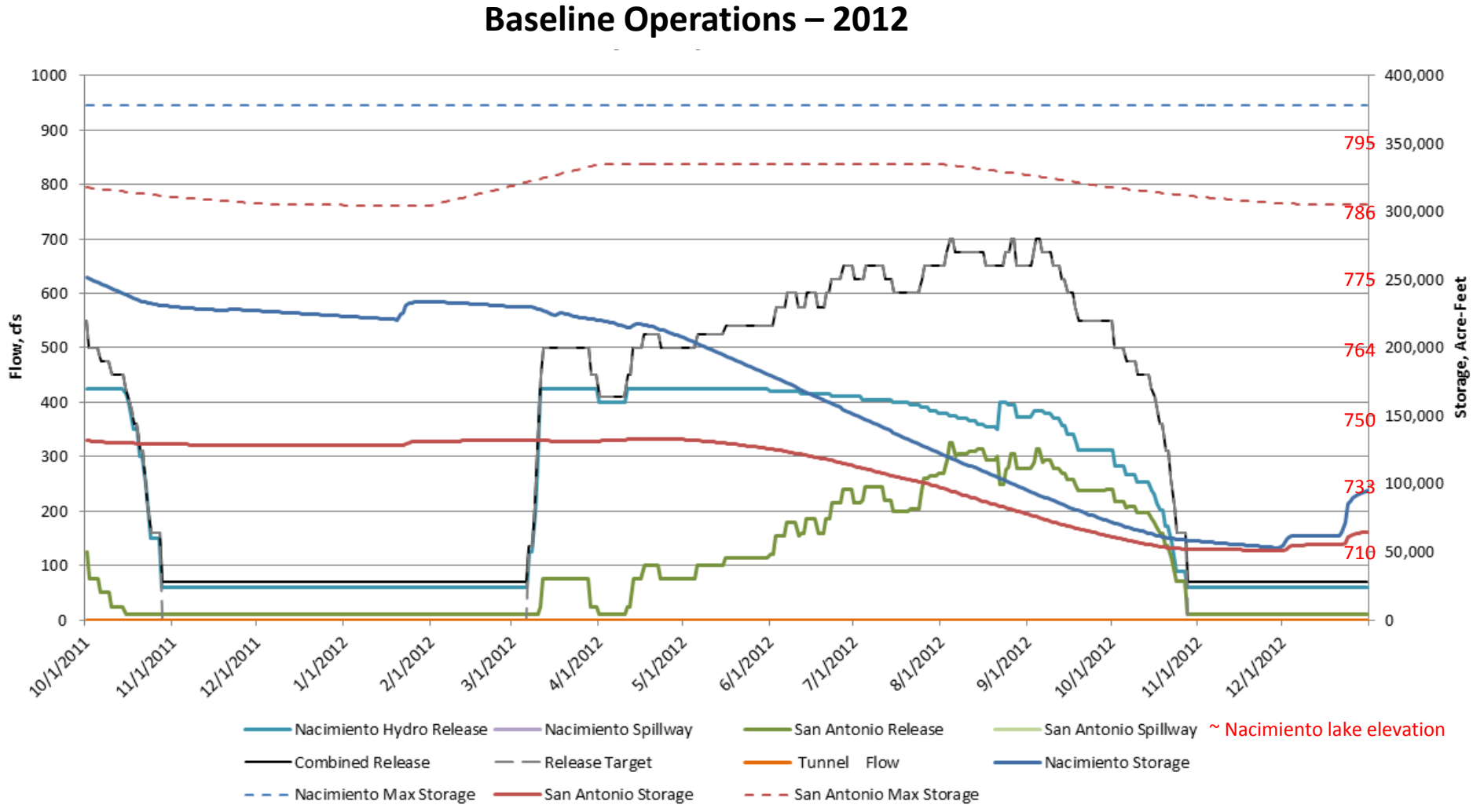


2011 – Tunnel Operations

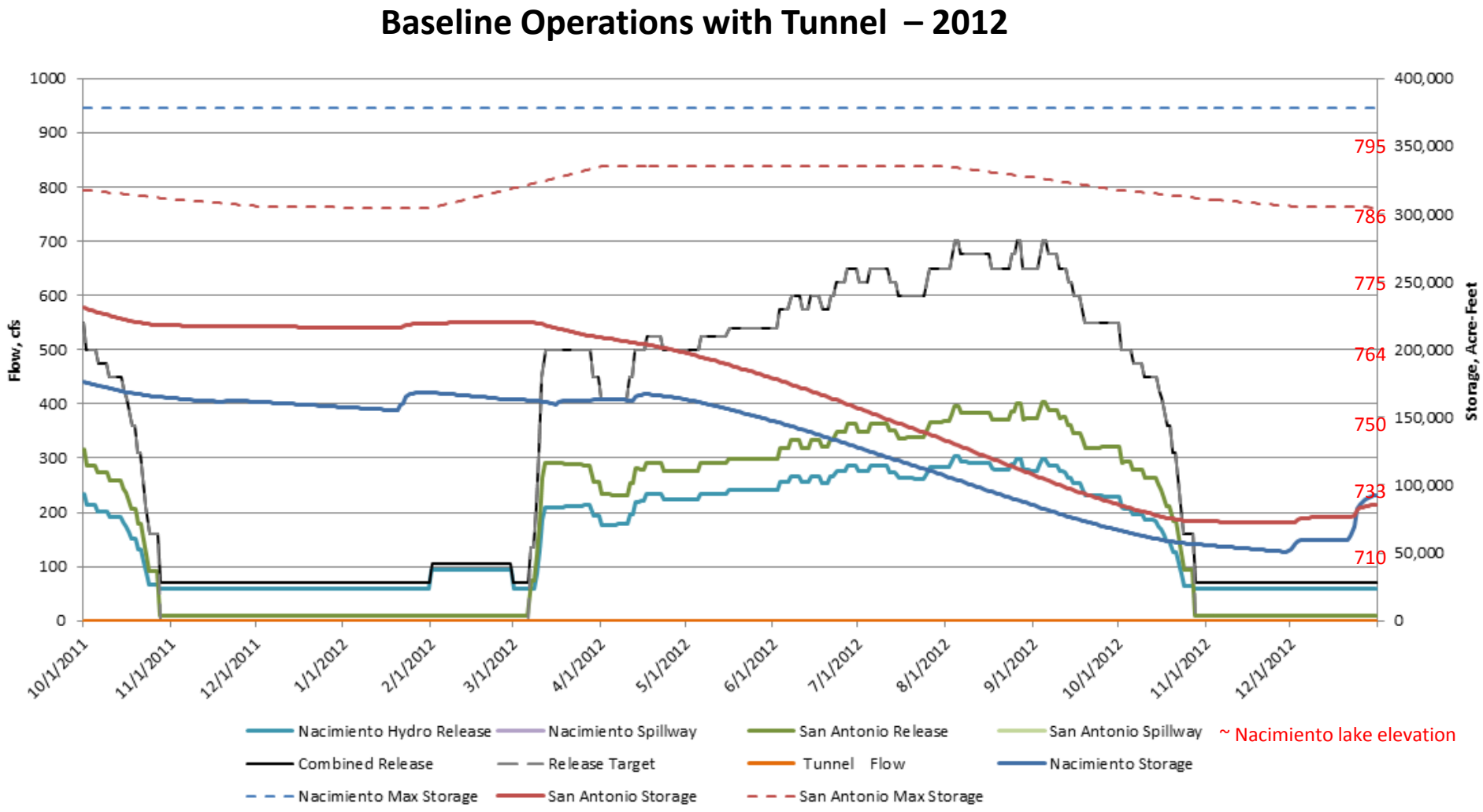
Tunnel transfers water to San Antonio



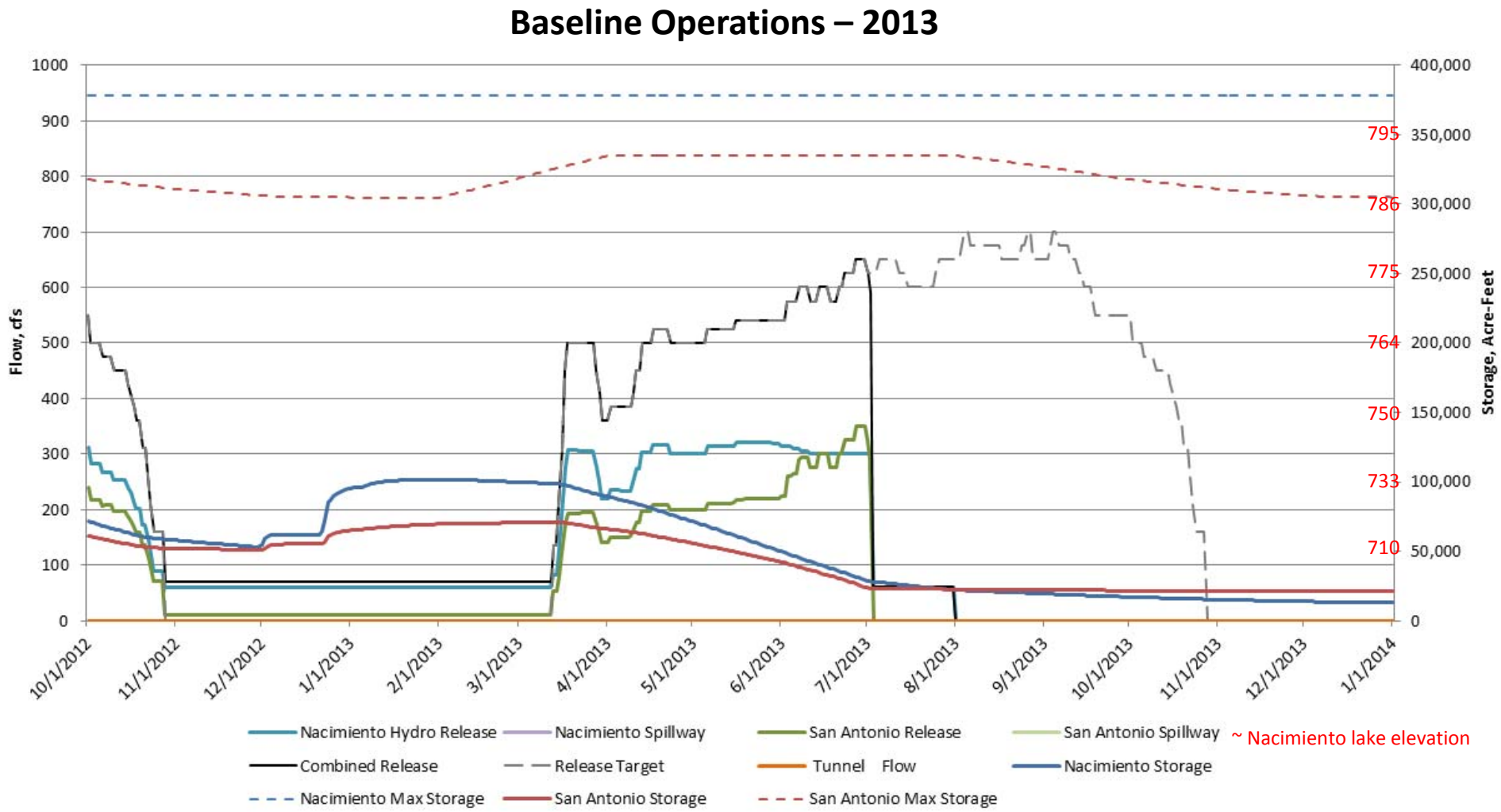
2012 – Baseline Operations



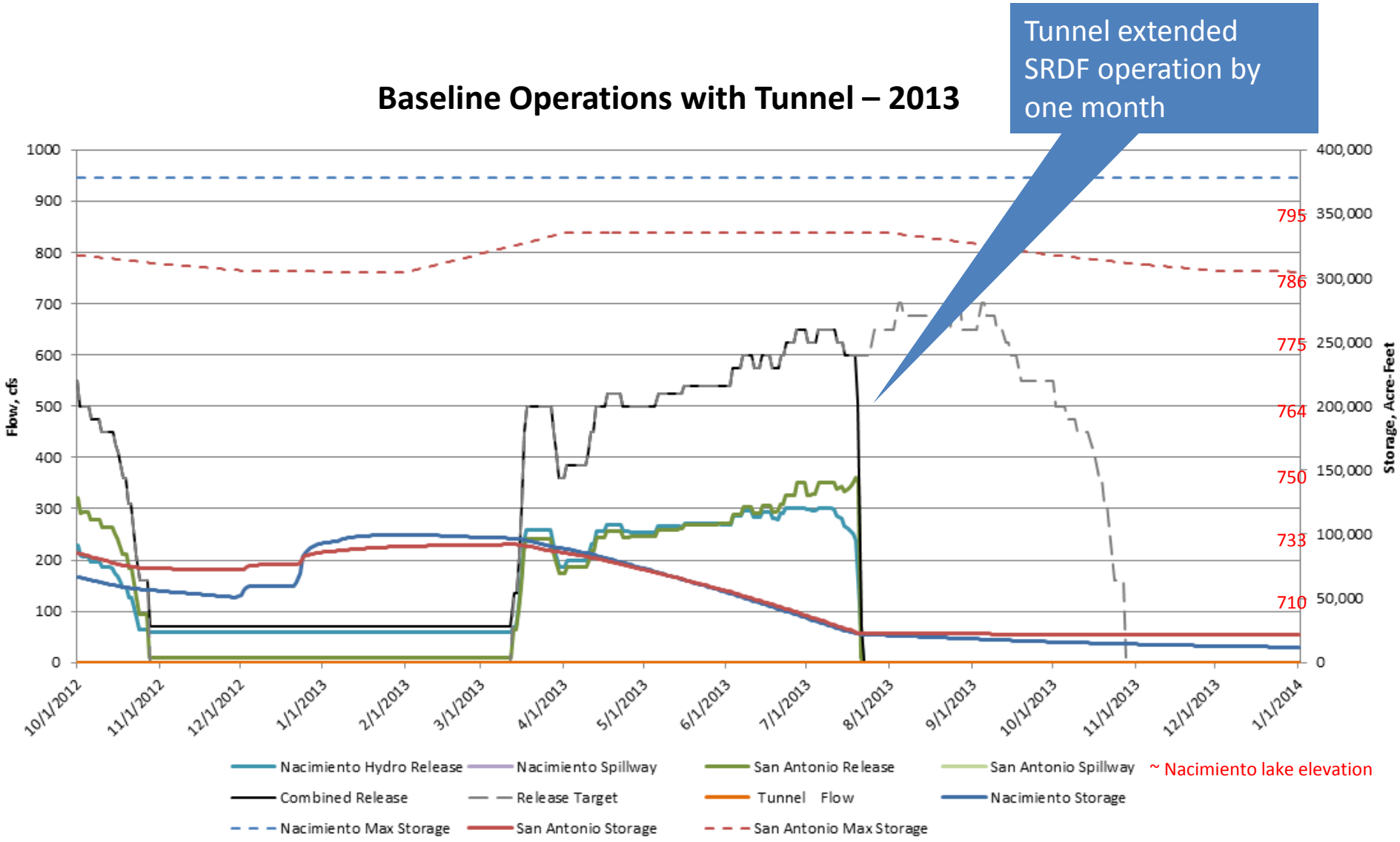
2012 – Tunnel Operations



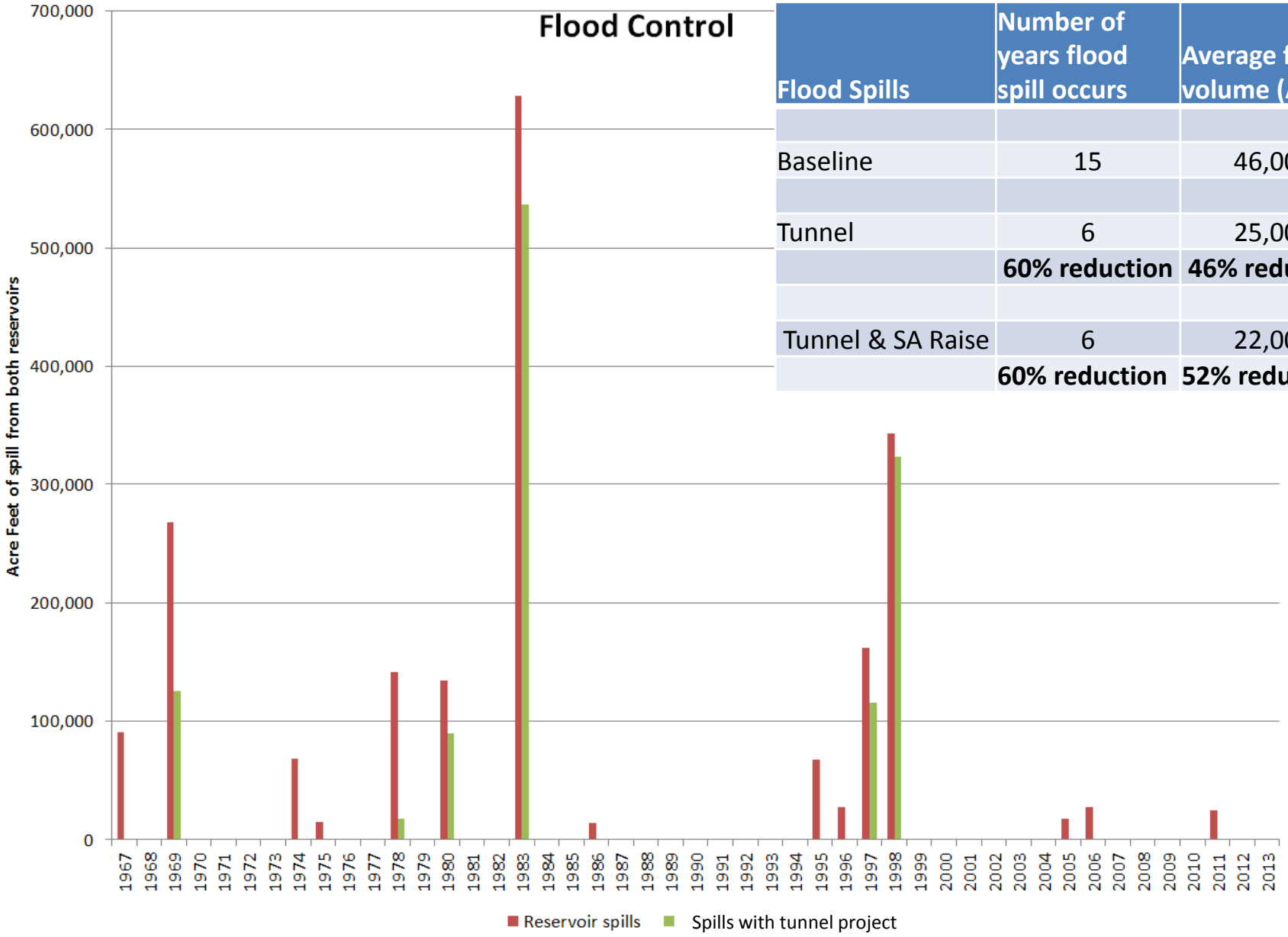
2013 – Baseline Operations



2013 Tunnel Operations



Flood Control Benefit



Flood Spills	Number of years flood spill occurs	Average flood volume (AFY)
Baseline	15	46,000
Tunnel	6	25,000
	60% reduction	**46% reduction**
Tunnel & SA Raise	6	22,000
	60% reduction	**52% reduction**

Additional Storage Opportunity

Opportunity to increase storage capacity in San Antonio reservoir 59,000 acre feet (18%)

Additional Reservoir Storage

Modifying the spillway with a crest control device provides the effect of "raising the dam" up 10 feet.

Potential added storage increases the benefits of the tunnel by providing additional storage for flood control and conservation releases.

San Antonio Spillway Modification steps to evaluate

- Conceptual design of spillway modification structures
- Probable Maximum Flood (PMF) and Hydrologic Model analysis (HMR58)
- Stability analysis
- Hydraulic capacity analysis
- Evaluation of modifications by DSOD

Interlake Tunnel and Spillway Modification Operational Modeling Results

(for water years 1967 - 2013)
(Average Acre Feet/Year)

	Reduction in Spills	Increase in Total Controlled Releases	Tunnel Transfers
10’ Tunnel	7,736	16,327	50,493
10’ Tunnel & SA spillway mod*	11,857	20,686	53,840

Flood Spills	Number of years flood spill occurs	Average flood volume (AFY)
Tunnel	**60% reduction**	**46% reduction**
Tunnel & SA spillway mod	**60% reduction**	**52% reduction**

* (adds 59,000 AF of reservoir storage to San Antonio)

Tunnel Project Benefits
Water Supply Sustainability

- Significant increase in flood control storage, thus a reduction in flood damage downstream
- Additional surface water available to serve current and future suite of infrastructure projects
- Provides a supply of surface water to help sustain ground water supply by offsetting pumping
- Provides environmental benefits through increased flows in the Salinas River

Plan for additional public collaboration on model specifics

As requested by Salinas Valley Water Coalition:

1. Conduct technical evaluation of tunnel and reservoir simulation model to confirm reasonableness of downstream demands.
2. Evaluate model to accommodate SRDF full design capacity demands.
3. Agree on implementation of the tunnel and spillway modification project and operation of the new infrastructure.

ENVIRONMENTAL CLEARANCE AND PERMITTING

Preliminary environmental impacts

- **Surface impacts**: minimal grading at portal sites, intake structure at Lake Nacimiento, and headwall tunnel portal structure at Lake San Antonio. Tunnel muck disposed at site near San Antonio Dam.
- **Noise impacts**: Minimal at receptors adjacent to the tunnel construction portal at San Antonio and the intake structure at Lake Nacimiento.
- **Biological impacts**: TBD. Related to water diversion from Lake Nacimiento to Lake San Antonio.
- **Paleontological impacts**: TBD. Impact zone at tunnel portals only.
- **Geologic/Seismic Hazards**: TBD
- **Water resources/Flooding impacts**: TBD. All water rights and water discharge agreements will not be affected. Project assists with flood control.
- **Recreational /Public Facilities impacts**: TBD

No impacts expected relative to:

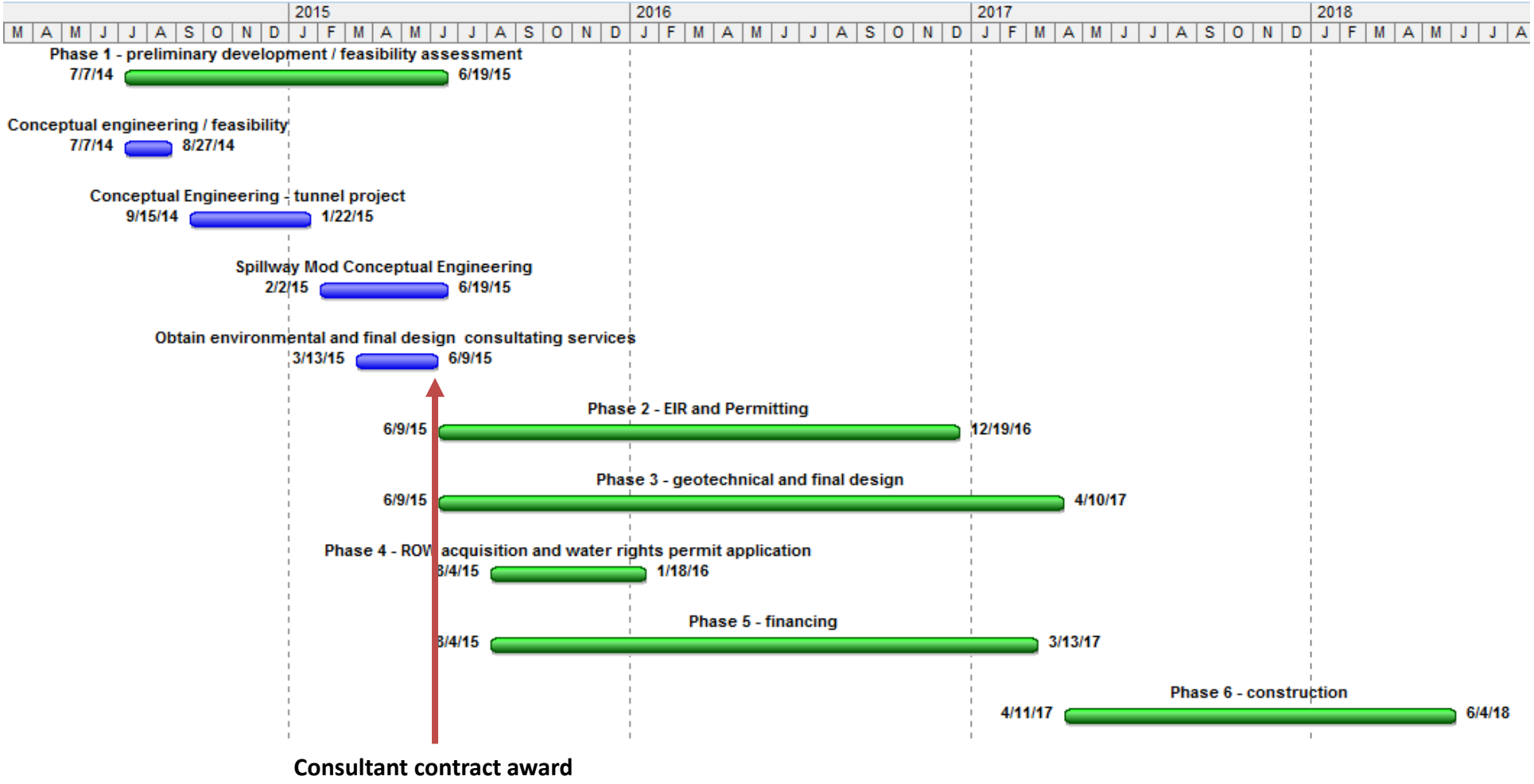
- Aesthetics/visual resources
- Agricultural resources
- Air Quality
- Cultural resources
- Energy
- Fire Protection
- Hazardous materials
- Historic resources

Preliminary biological impacts

- White bass – predator sport fish prohibited from export (alive) from Lake Nacimiento
- Quagga and Zebra Mussels transfer from Nacimiento to San Antonio
- Mercury in Lake Nacimiento sediment
- Downstream releases to maintain steelhead migration (NOAA Fisheries)

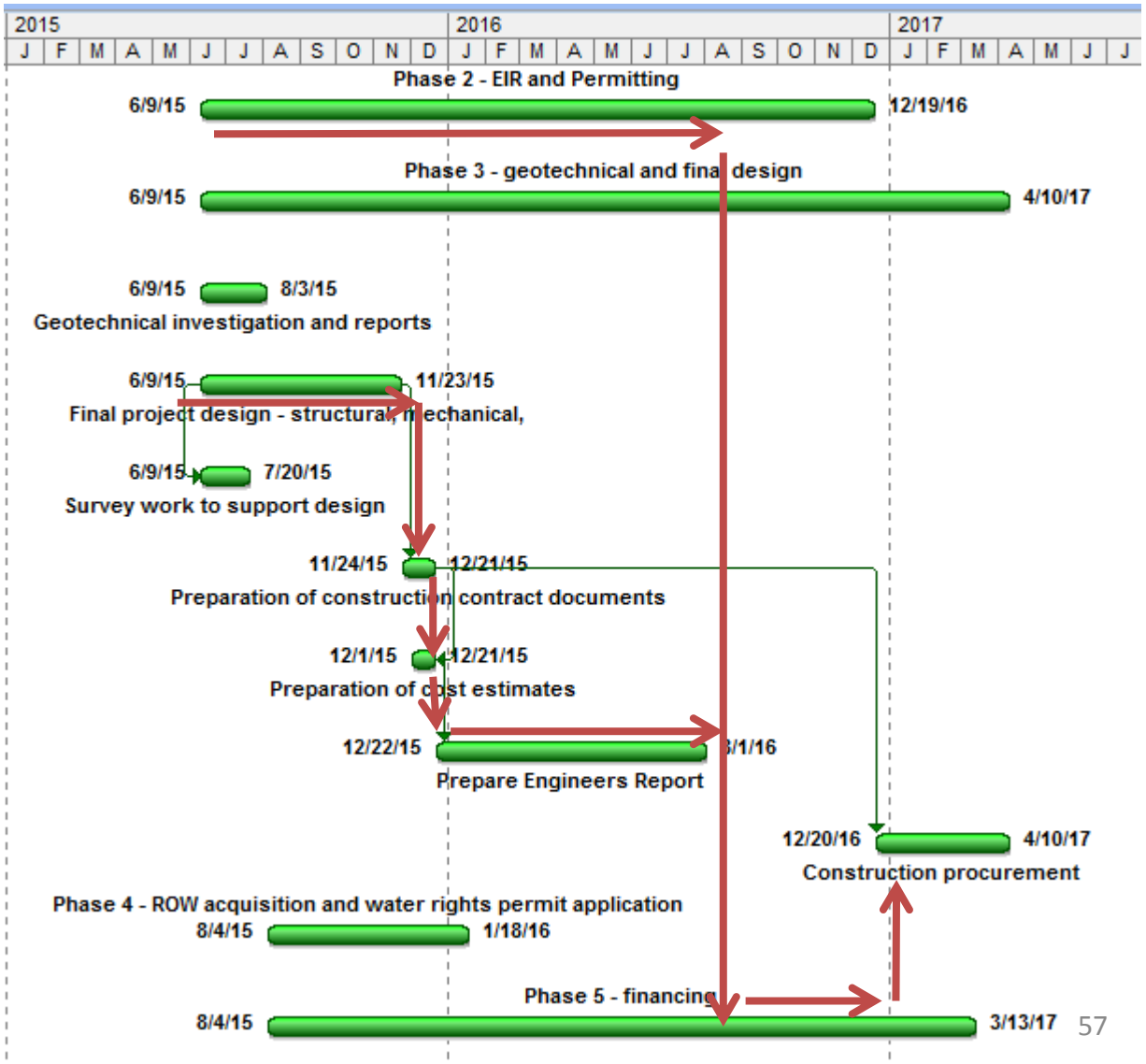
DEVELOPMENT SCHEDULE

Project Development Schedule



Critical Development Path

- Phase 2 - permit applications (75% environmental complete)
- Phase 3 - geotechnical and final design (75% design)
- Phase 5 - financing



Procurement of professional services

Procurement	Schedule
Environmental consultants	March – May 2015
Engineering design consultants	March - May 2015
Tunnel Contractor Design-Build in accordance with AB 155 with mandatory Project Labor Agreement (PLA)	Oct 2016 – Jan 2017
Spillway Modification Contractor Design-Bid-Build procurement	Oct 2016 – Jan 2017

COST AND FINANCING PLAN

Interim financing

MCWRA and Monterey County financing agreement

Final design & geotechnical engineering (75%)	$900,000
Permitting and environmental approval (75%)	$800,000
Financing plan implementation	$350,000
Program Management	$250,000
Subtotal – Interlake Tunnel	$2,300,000
Spillway Modification Engineering	$200,000
Total Interim Financing request	**$2,500,000**

Interlake Tunnel & San Antonio Spillway Modification

Cost Estimate (Dec 2014)

($000)

Phase 1 - preliminary engineering	$315
Phase 2 - permit applications	$1,198
Phase 3 - geotechnical and final design	$1,311
Phase 4 - ROW acquisition and water rights verification	$244
Phase 5 - financing	$342
Phase 6 - construction	$32,206
Program Management	$1,387
Construction Management	$1,200
Expenses	$300
Contingency	$9,500
Subtotal Tunnel	$48,003
San Antonio Spillway Modification*	$15,000
Total	$63,003

*- placeholder estimate. Costs have not been calculated

Financing options

1. **Proposition 218 tax assessment on beneficiaries**

   To service the operating costs and debt service on long-term bonds. This is the most viable option with a proven history of success in financing the Salinas Valley Water Project in 2008.

2. **California Infrastructure Financing Act – California Government Code Section 5956 (Public Private Partnership).**

   Provides the means to develop an infrastructure project involving private financing if a revenue stream can be identified to pay the debt service.

3. **Water Quality, Supply, and Infrastructure Improvement Act of 2014 (Water Bond).**

   Grant funding for water projects that qualify for State funds.

4. **Proposition 84 (IRWM) grant funds**

Proposed Financing Plan

- 218 Proposition – tax levy on beneficiaries
- Similar in plan and structure to 218 financing for the Salinas Valley Water Project – Zone 2C
- Assessment formulas based on proportional weighting of:
  - Active / Passive land use factors
  - Special benefits from project

QUESTIONS AND ANSWERS