



# Interlake Tunnel and Spillway Modification

PROJECT STATUS REPORT  
JULY 6, 2018



# Agenda

1. Introduction – project orientation
2. Project Hydraulics
3. Design progress
4. Accomplishments to date
5. Development schedule
6. Capital budget update
7. Four month look ahead activities

# Project Team

**Owner**

**Monterey County Water Resources Agency**



**Program Management**

**EPC Consultants, Inc**



Phenix Environmental Planning



Hollenbeck Consulting



**Environmental services**

**Horizon Water & Environment**



**Engineering services**

**McMillen Jacobs Associates**



**GEI Consultants**



**Hydrologic Modeling**

**Wood Environment & Infrastructure Solutions**





# Project Orientation



Public infrastructure financed by benefiting properties



# Project Description – Water Conveyance Tunnel



10,940 feet long

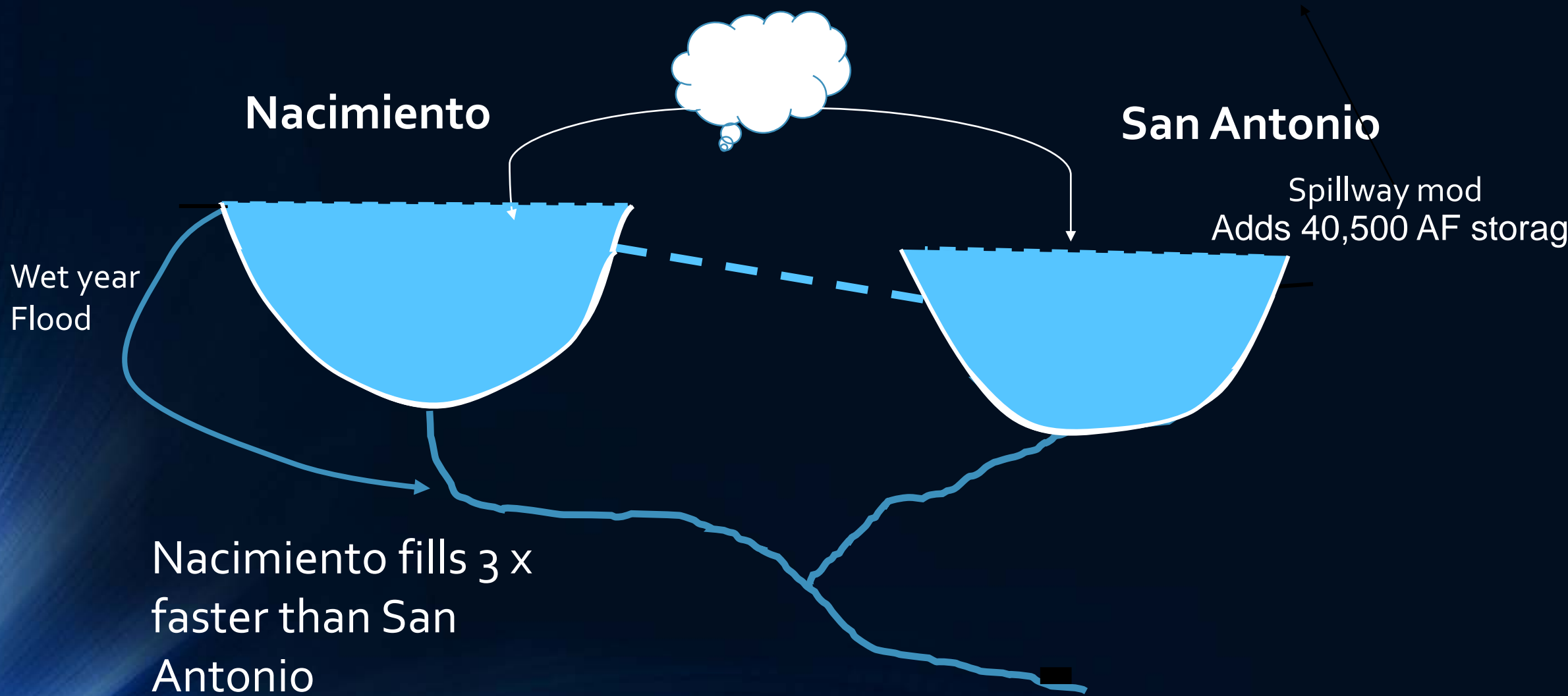
10 feet diameter

Concrete lined

Gravity flow



# Tunnel operating function



Nacimiento fills 3 x faster than San Antonio



# Project hydrology

1. Capturing additional water for storage
  - Provides means to divert flood control releases to San Antonio reservoir – Average diversion ~ 50,000 AFY
  - Without changing reservoir operating rules, creates an average of 8,000\* AF per year of new conservation releases
  - By optimizing reservoir operations, creates an average total of 20,000\* AF per year of new conservation releases
2. Creates new additional storage of 41,500 AF in San Antonio Reservoir
3. Reduces potential flood release volume by 52%

\* - From preliminary hydrologic modeling - 2015



# Project hydraulics and reservoir operations

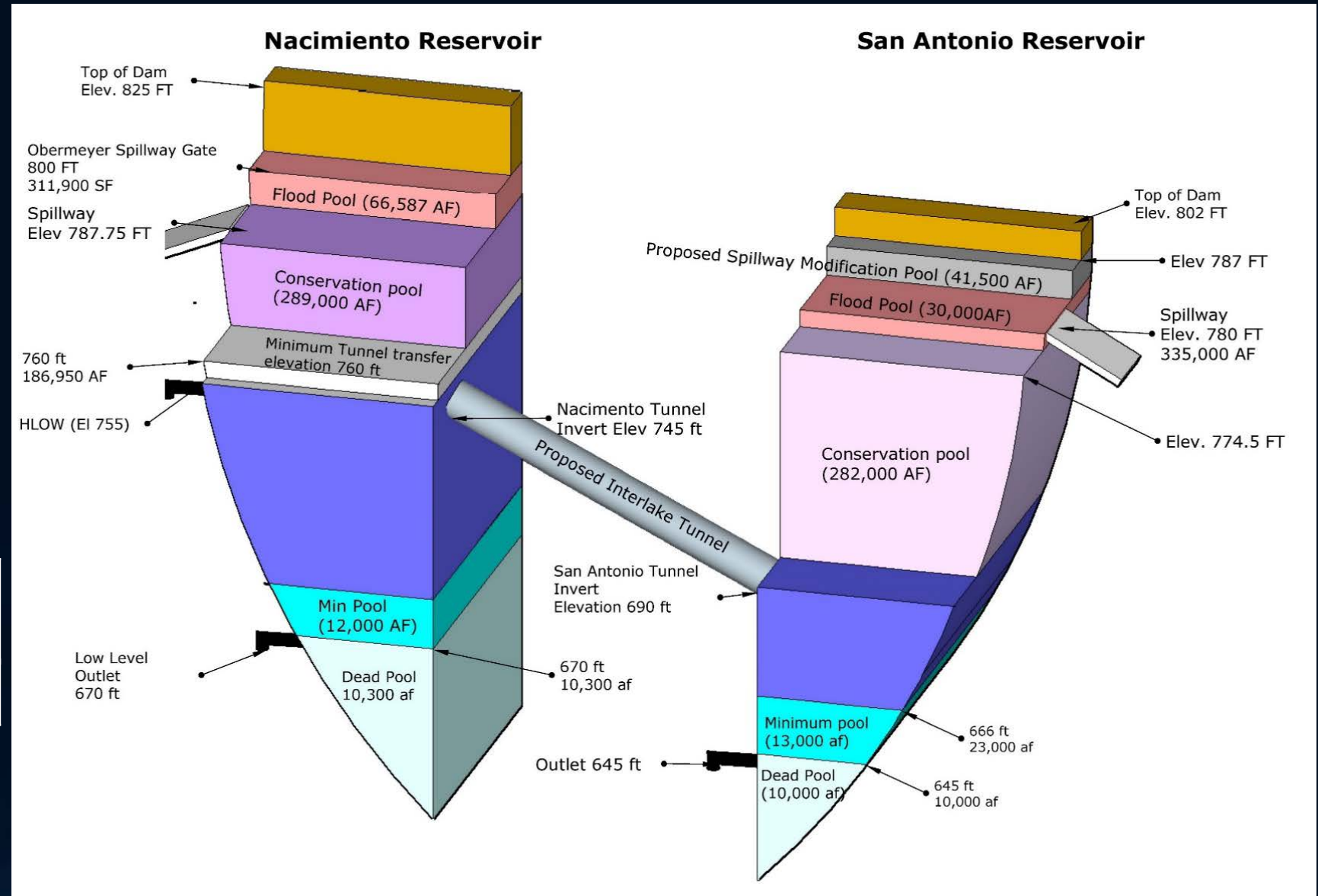
2017 example:

192,000 ACFT spilled

88,000 ACFT moved to San Antonio

Benefit:

Current Operations	Optimized Operations
8,000 AFY	20,000 AFY



\* Based on 2015 modeling results





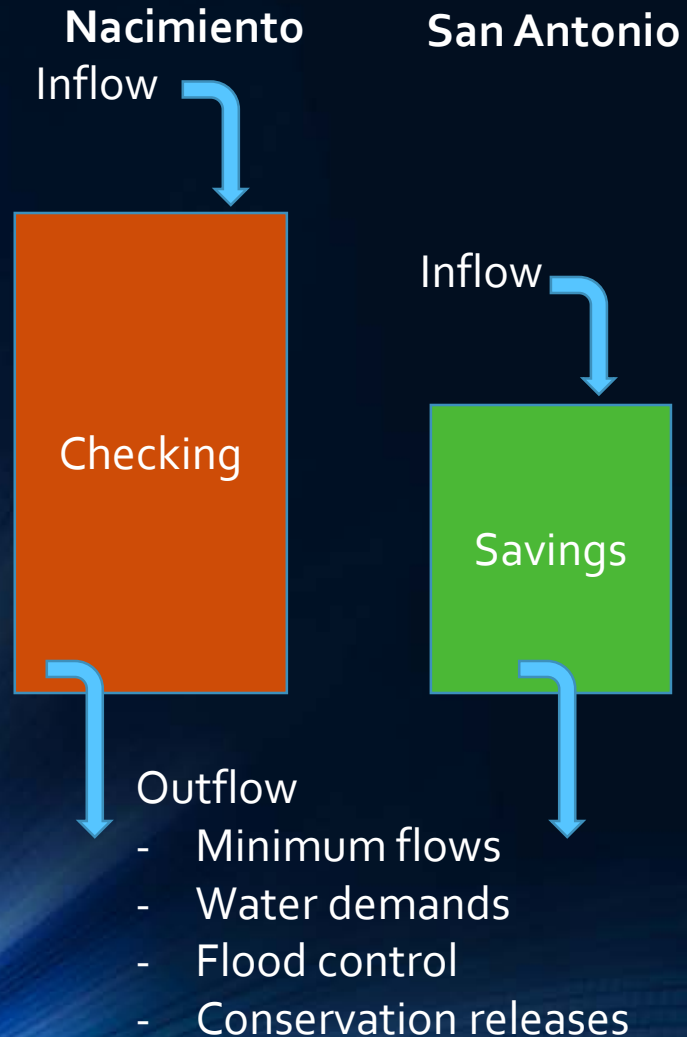
# Operating objectives

- Minimize flood releases and reduce downstream flood damage
- Increase the overall surface water storage
- Improve hydrologic balance of the ground water basin
- Continue to meet environmental flow requirements
- Minimize impact on existing hydroelectric production
- Preserve recreational opportunities in the reservoirs
- Protect agricultural viability and prime agricultural land

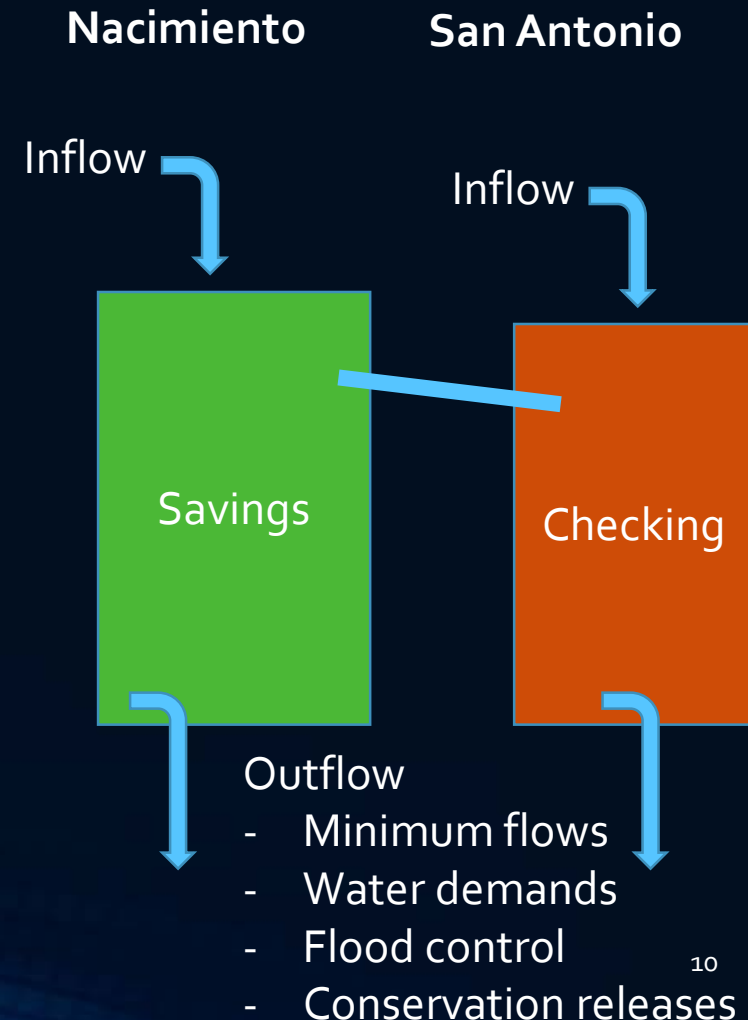


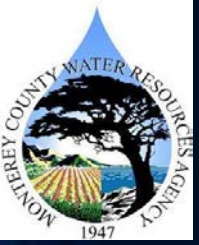
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## Current Operations

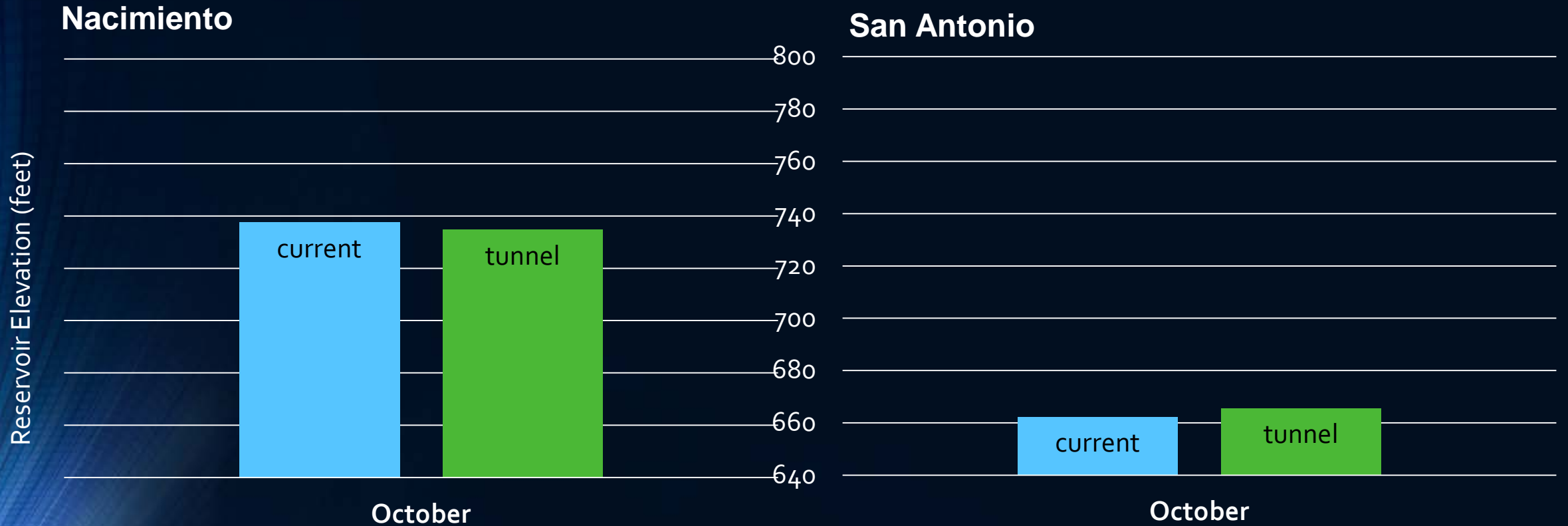


## Future Operations



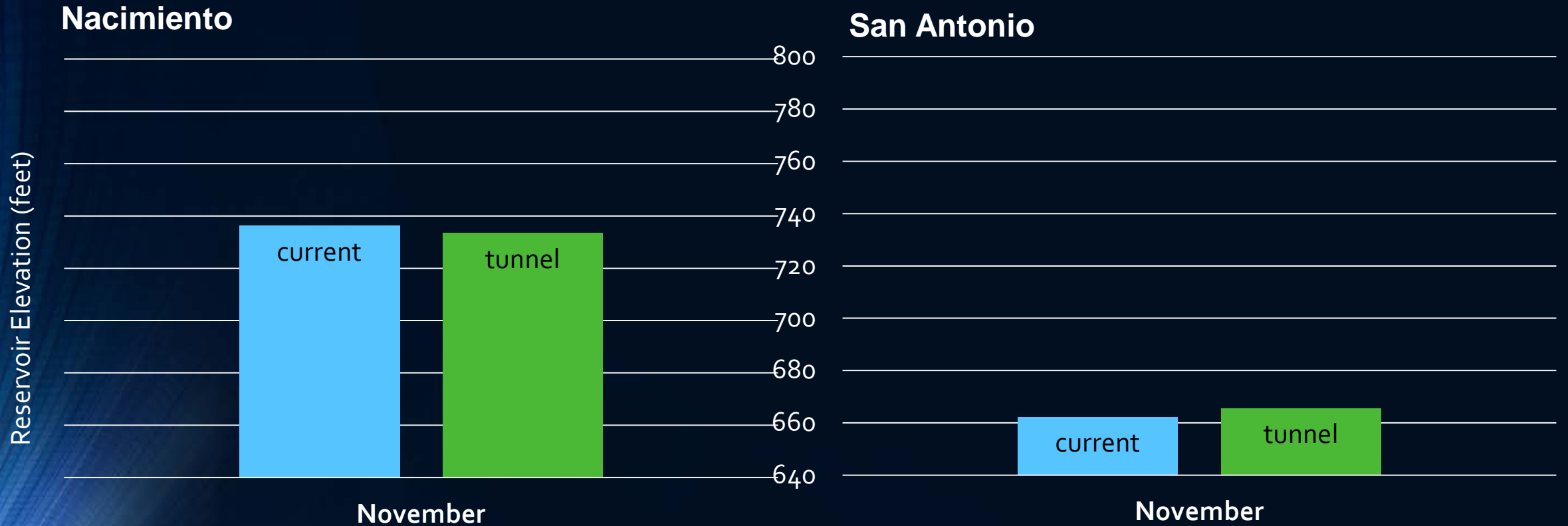


# Reservoir Elevations - Typical Wet Year Current operating procedure



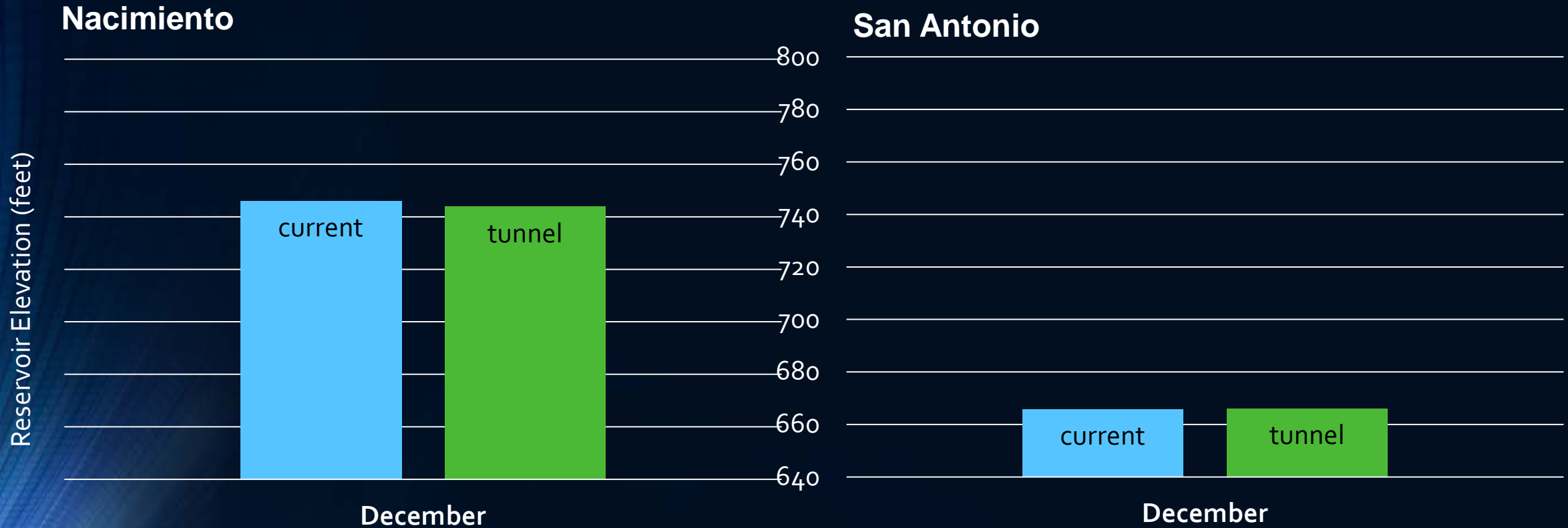


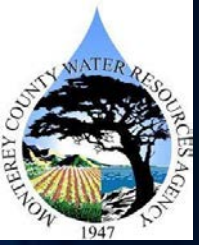
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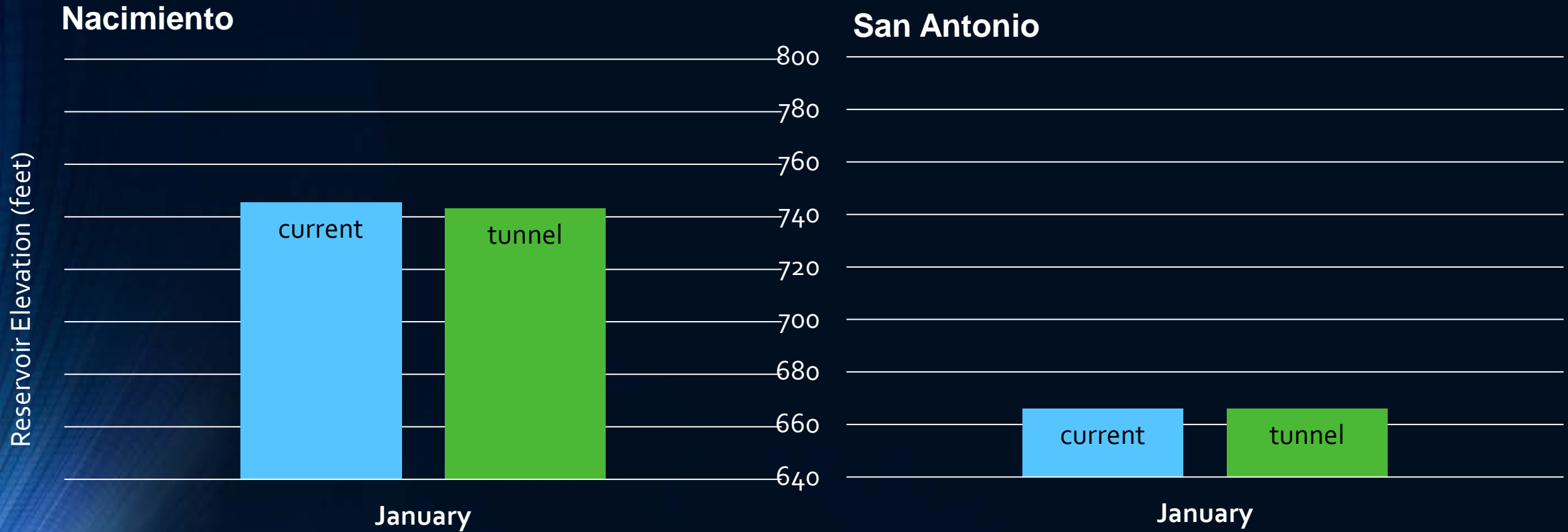


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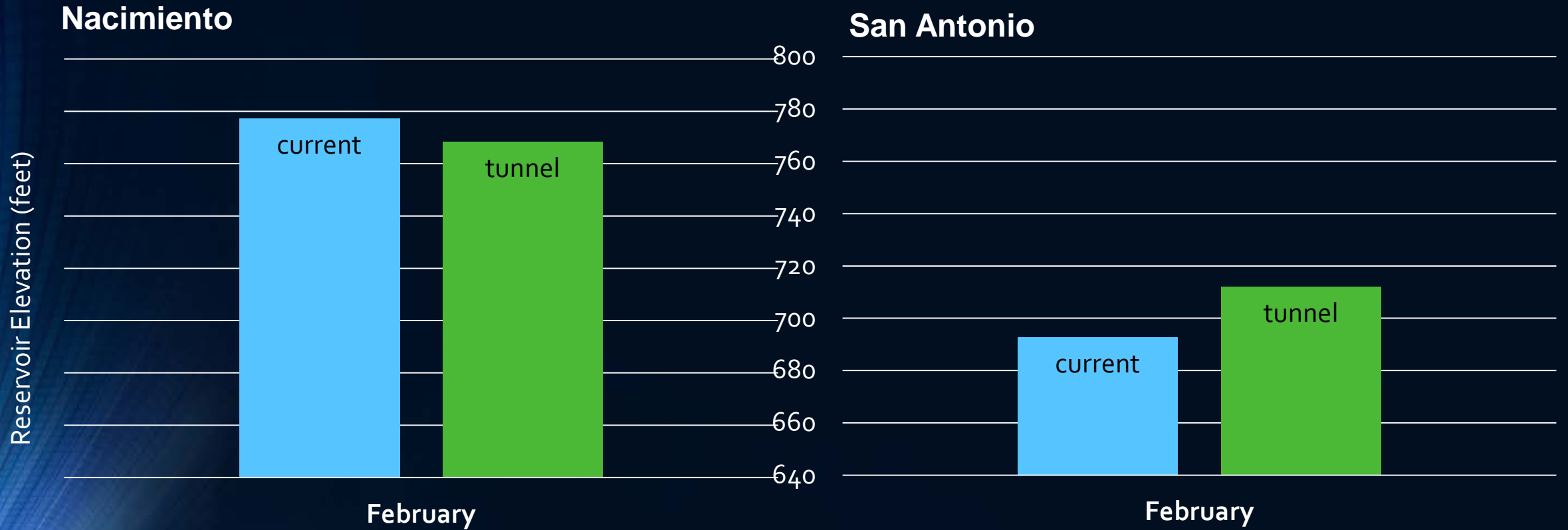


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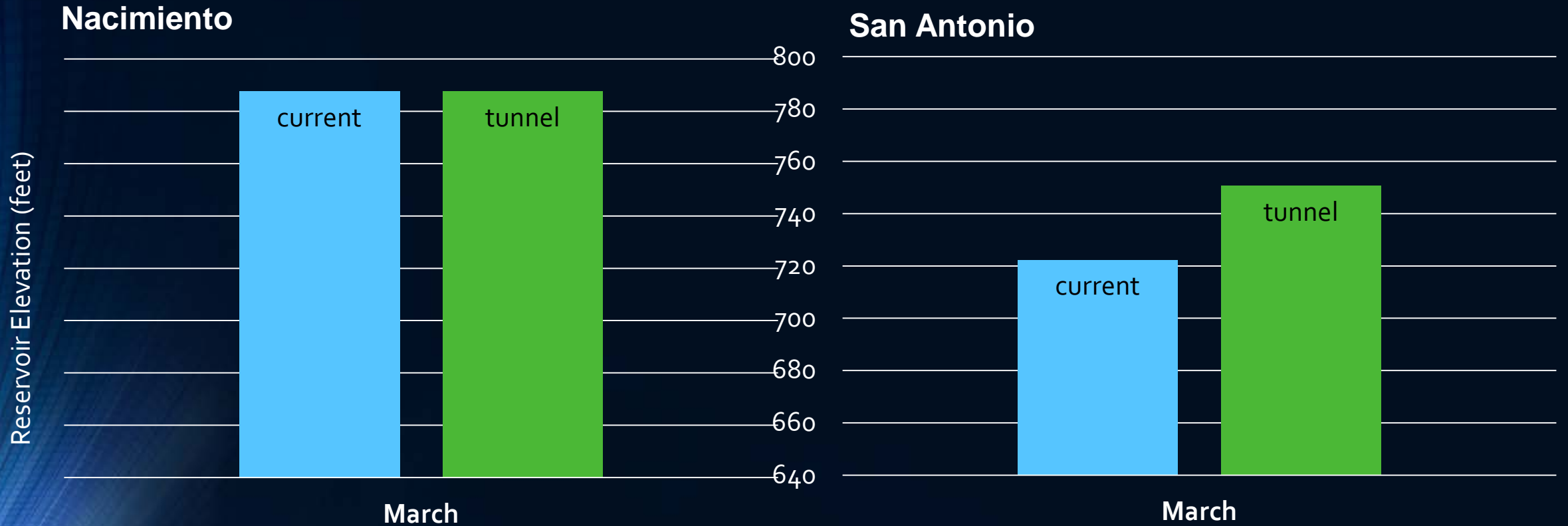


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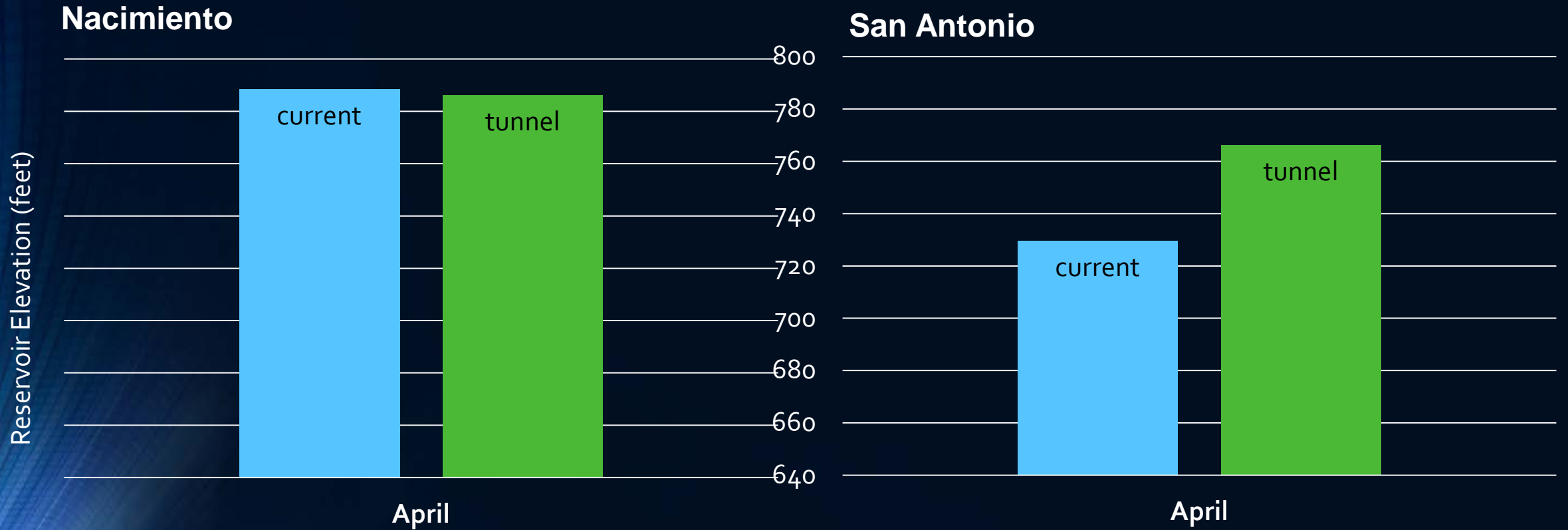
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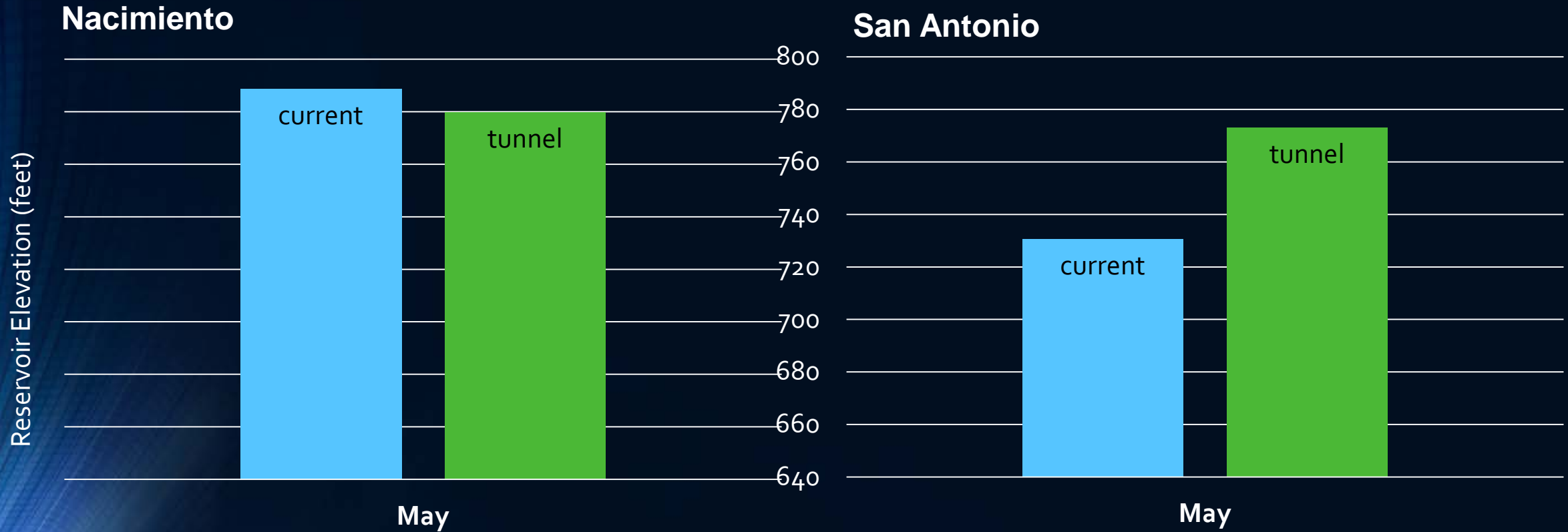


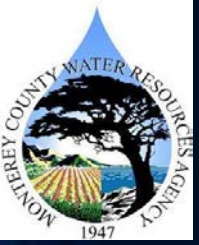
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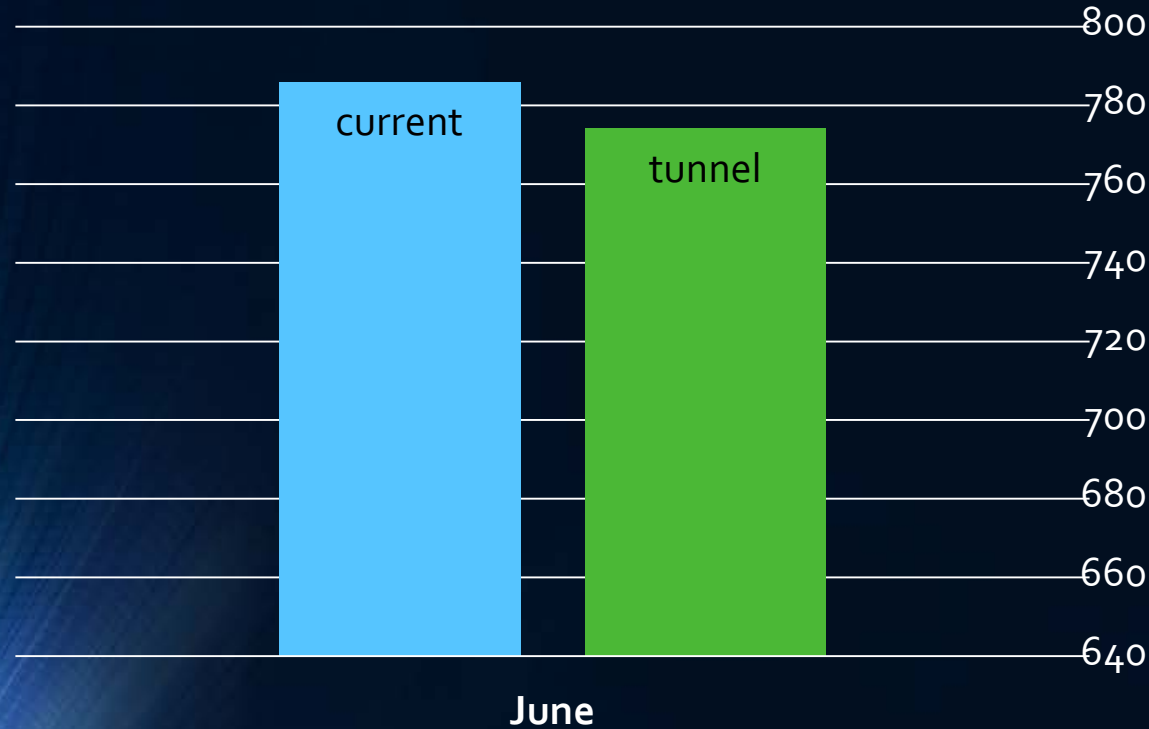
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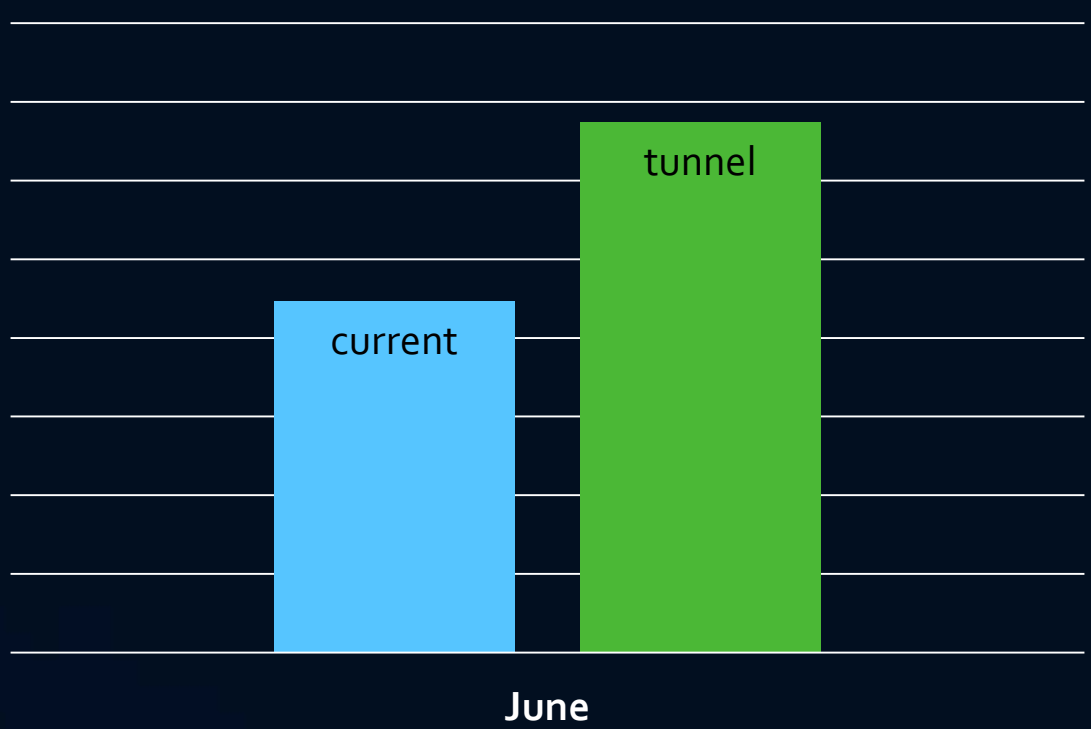


# Reservoir Elevations - Typical Wet Year Current operating procedure

## Nacimiento



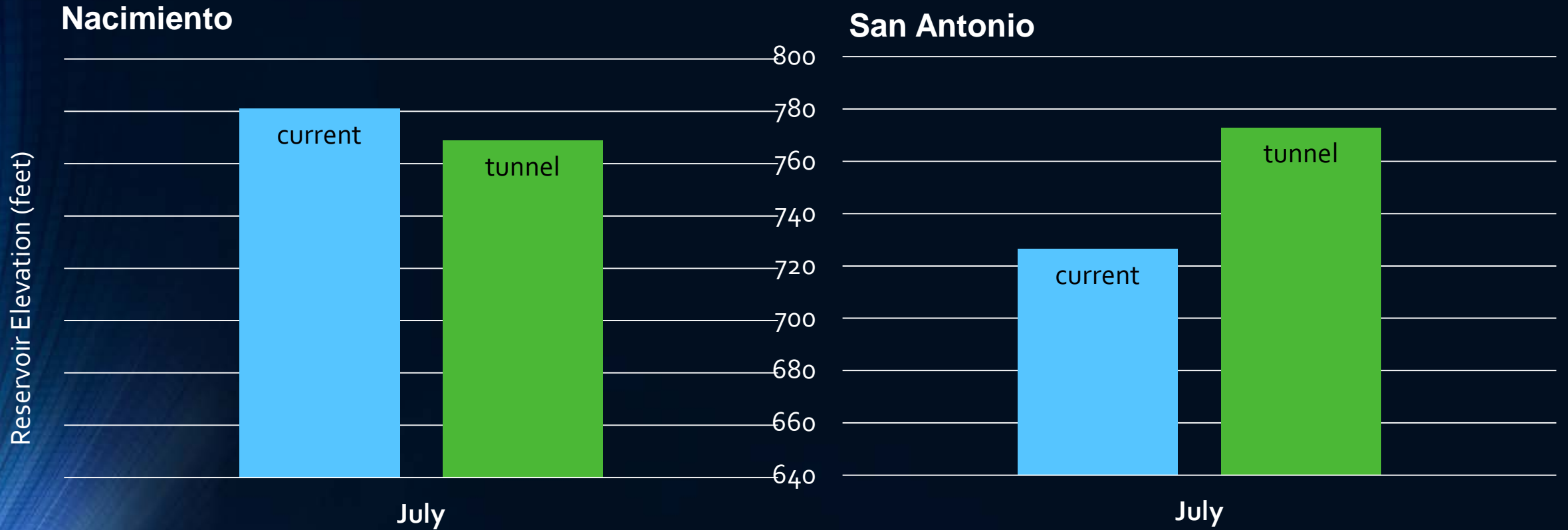
## San Antonio



Reservoir Elevation (feet)

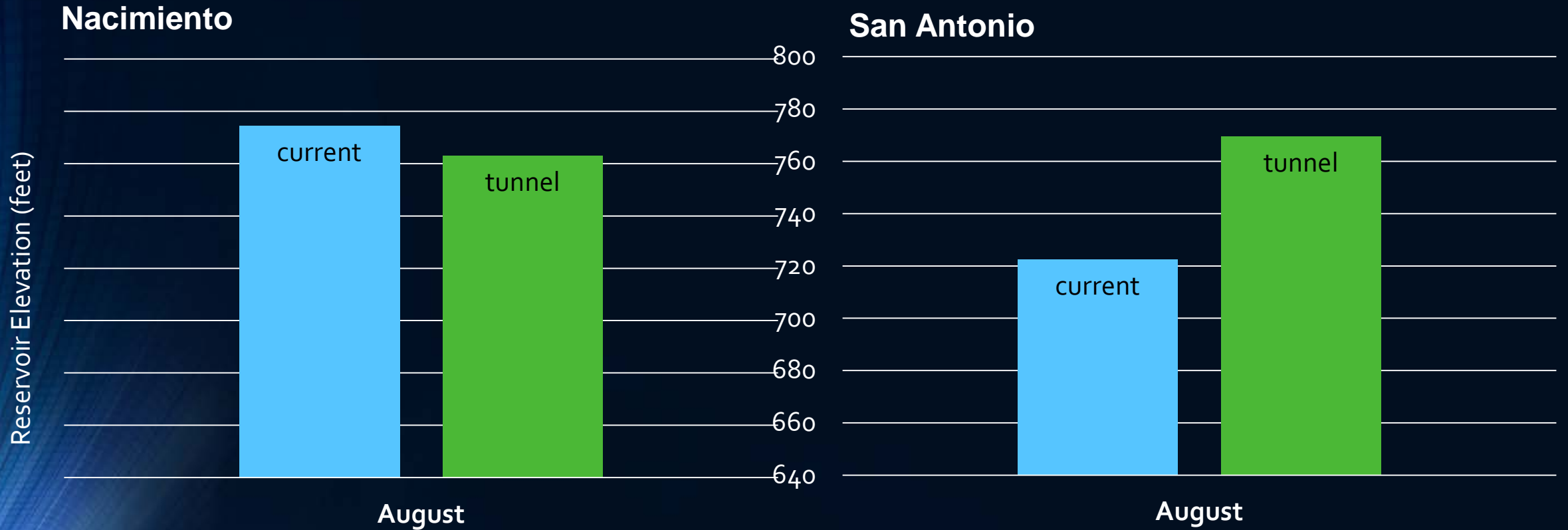


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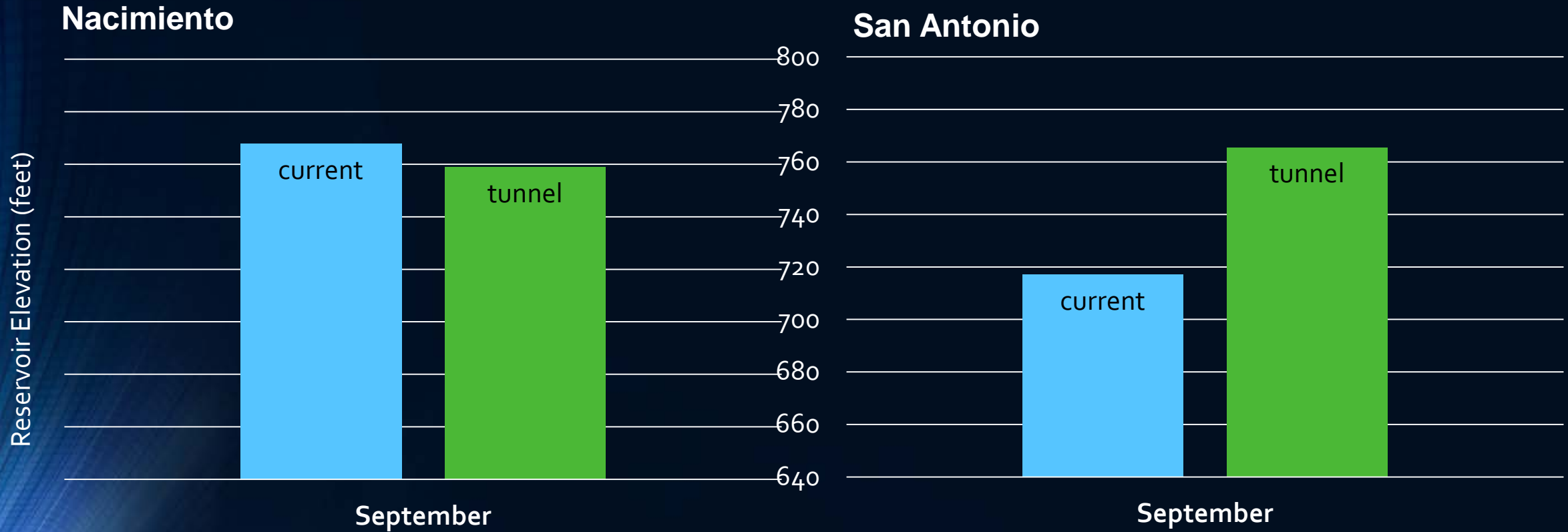


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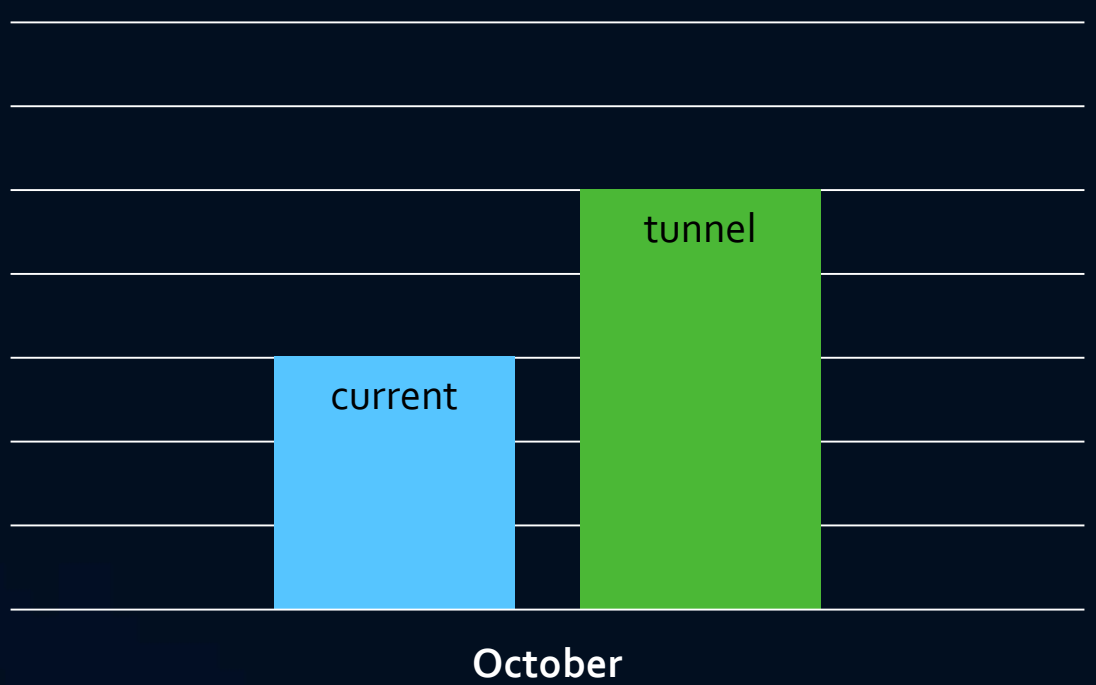
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## Current operating procedure

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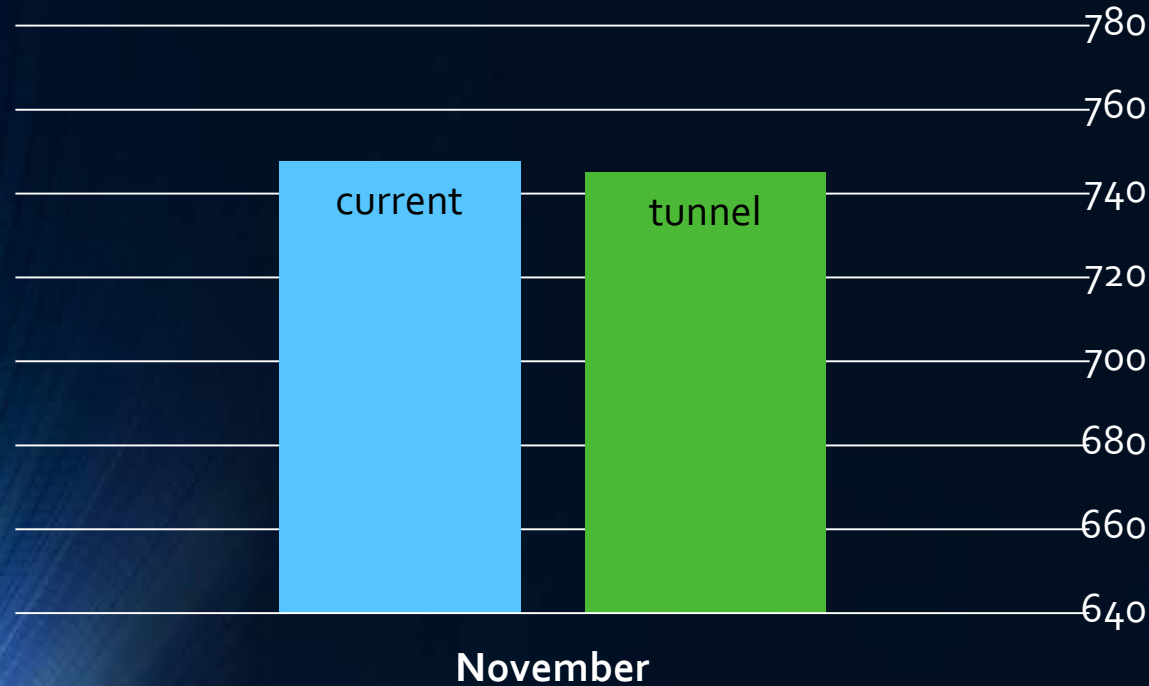




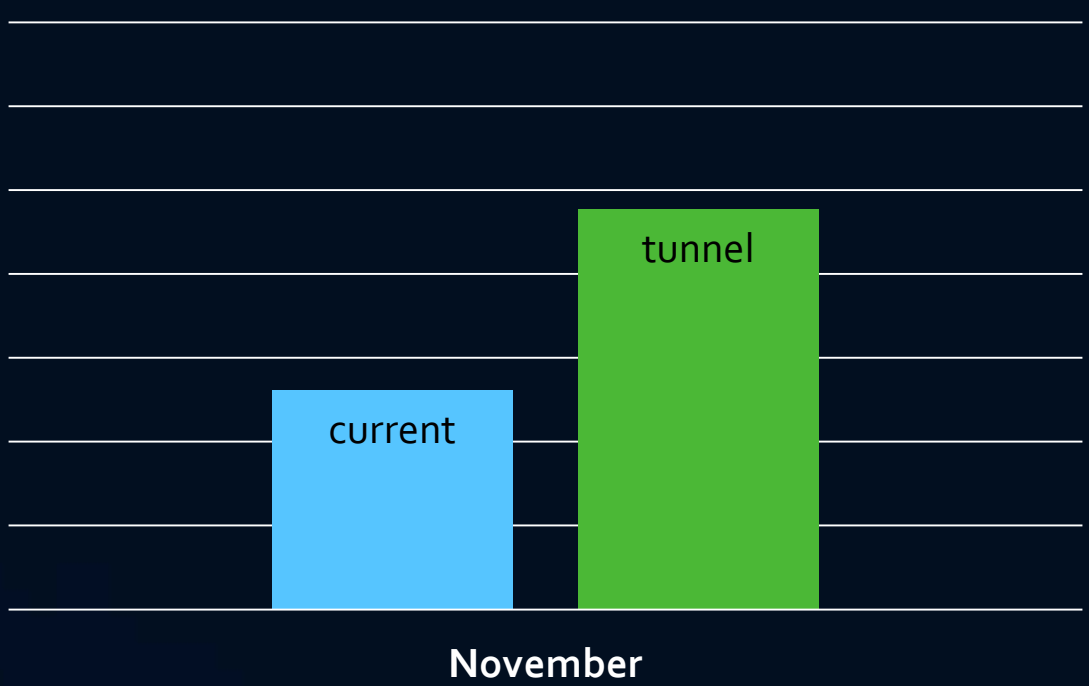
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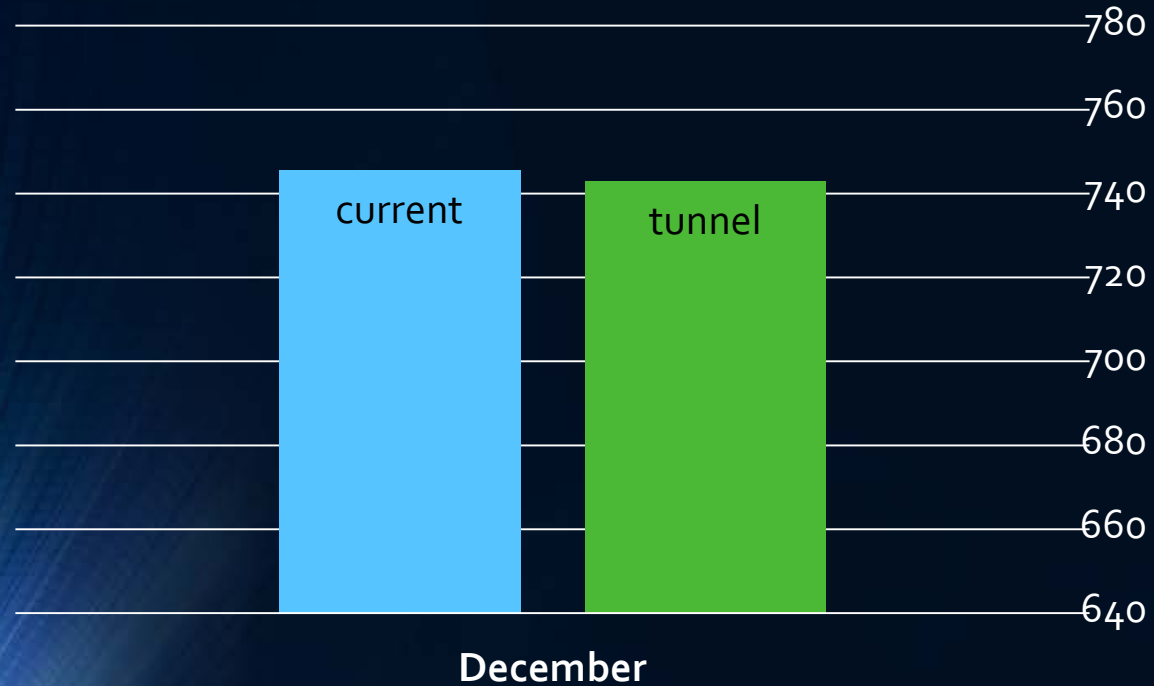




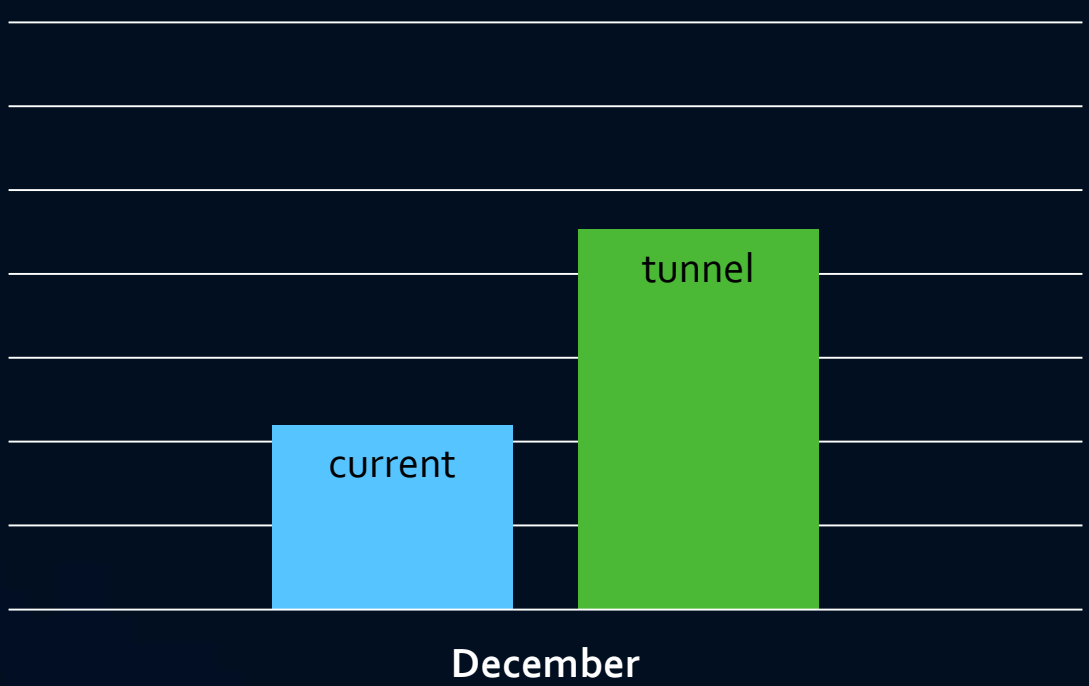
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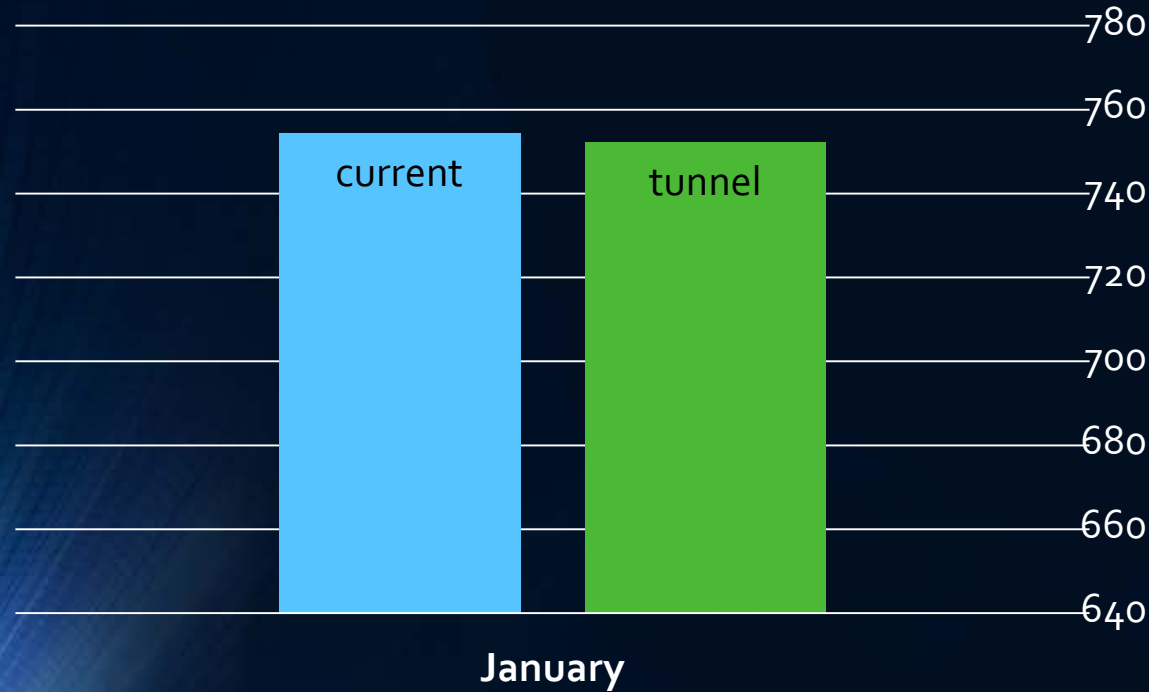




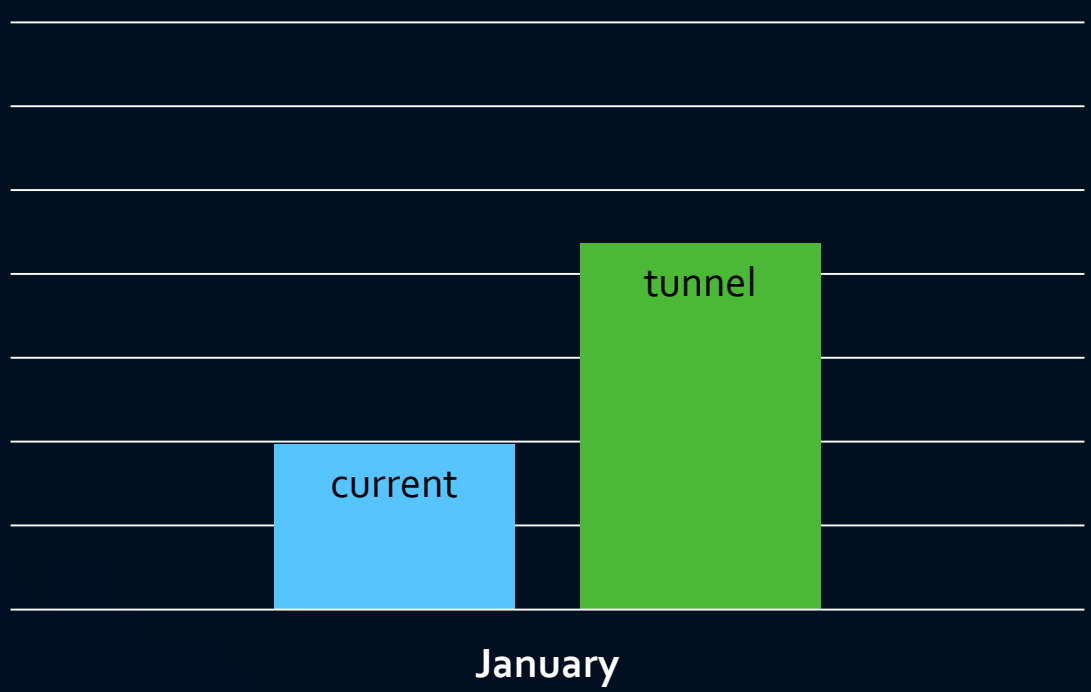
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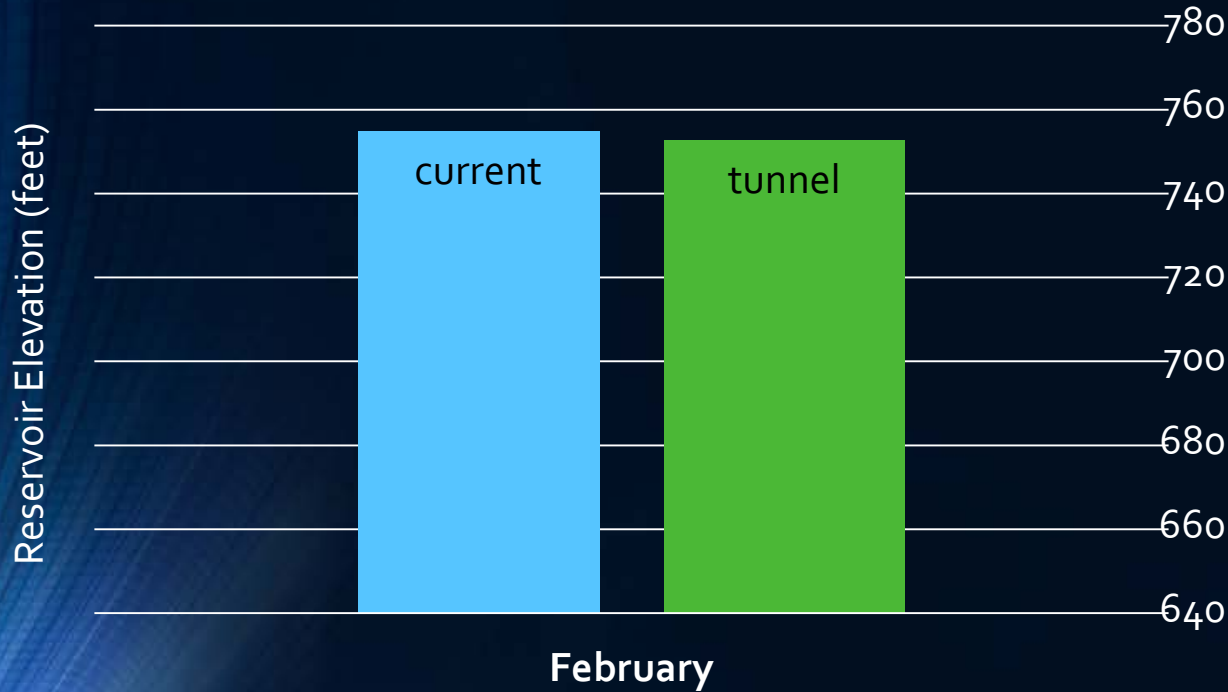
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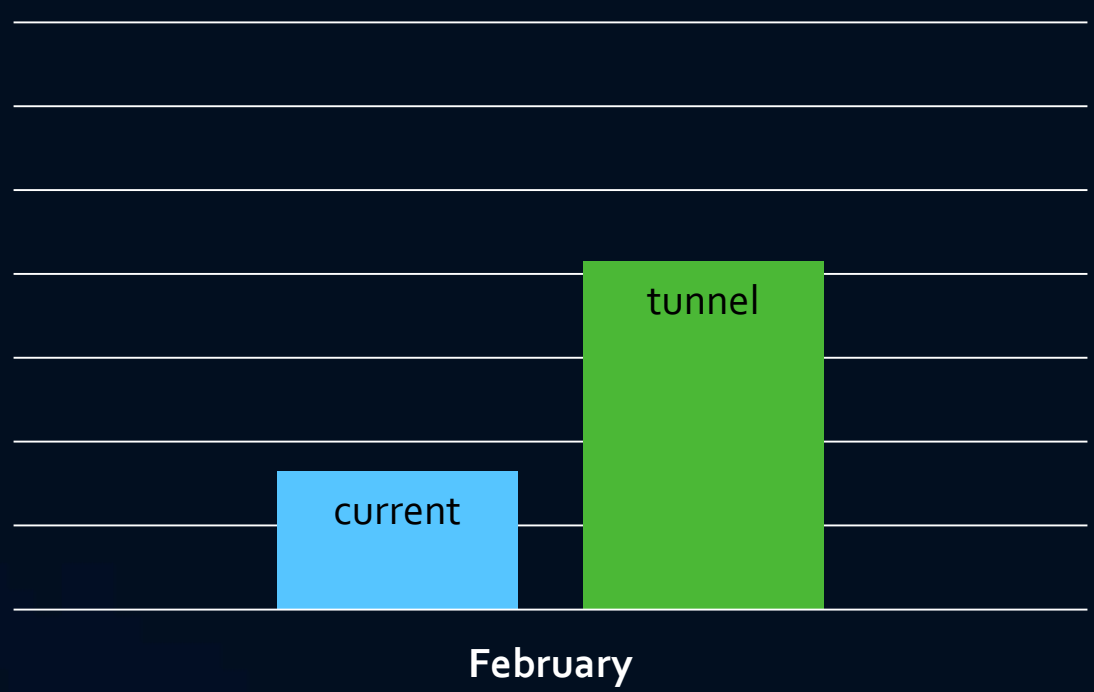
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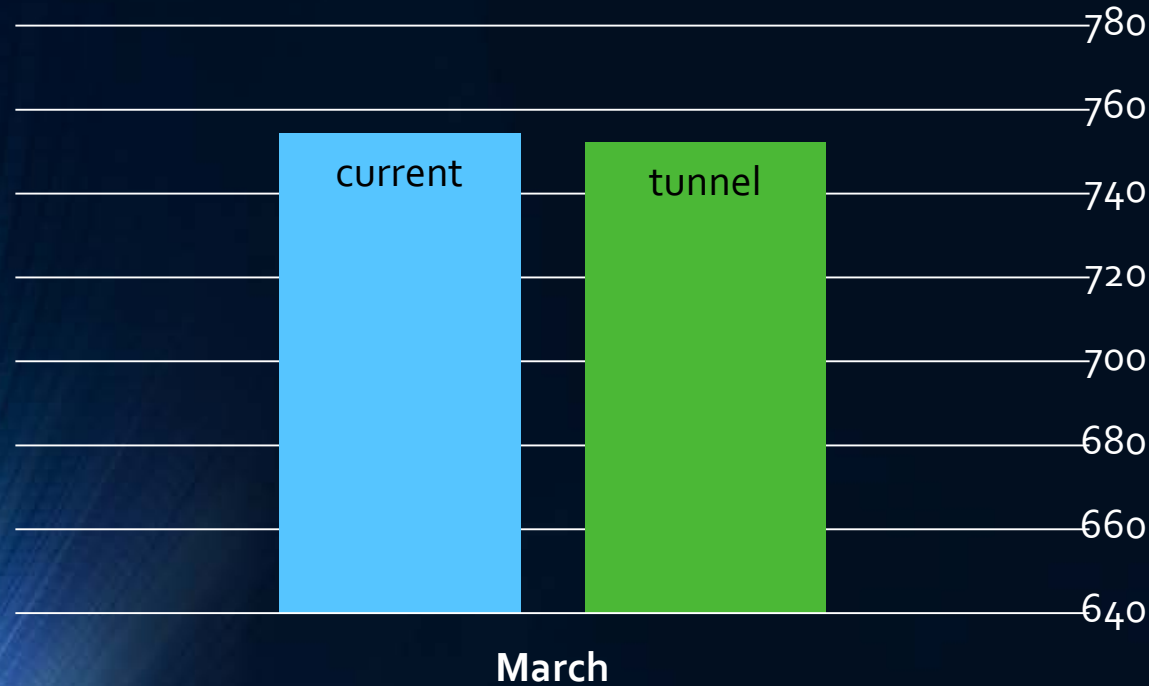




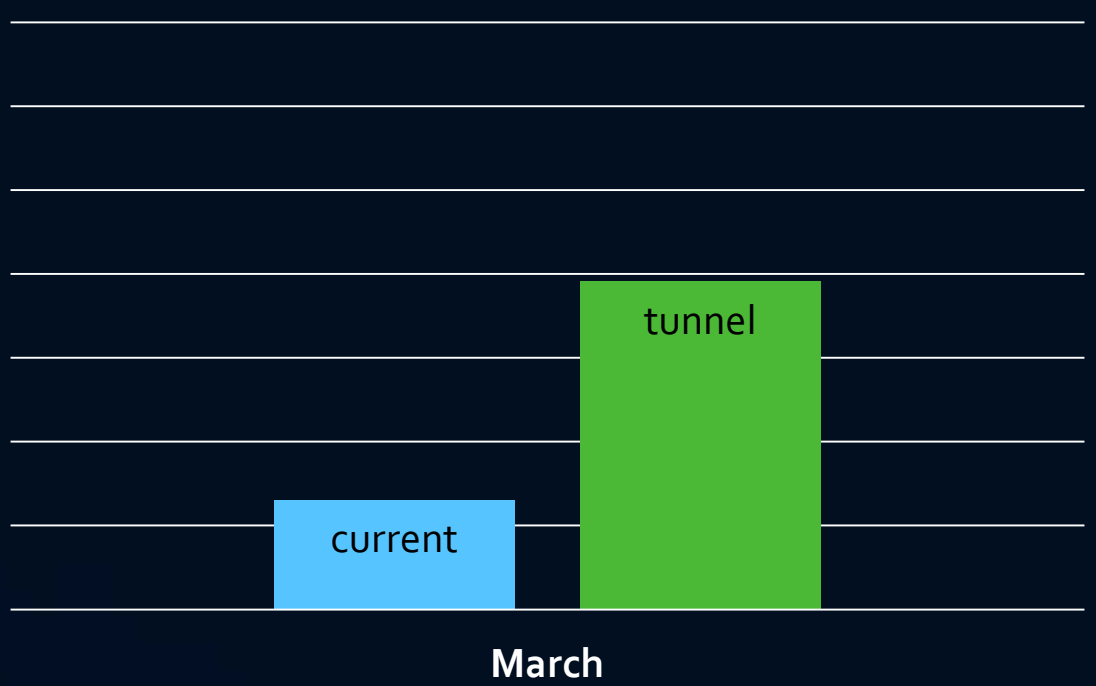
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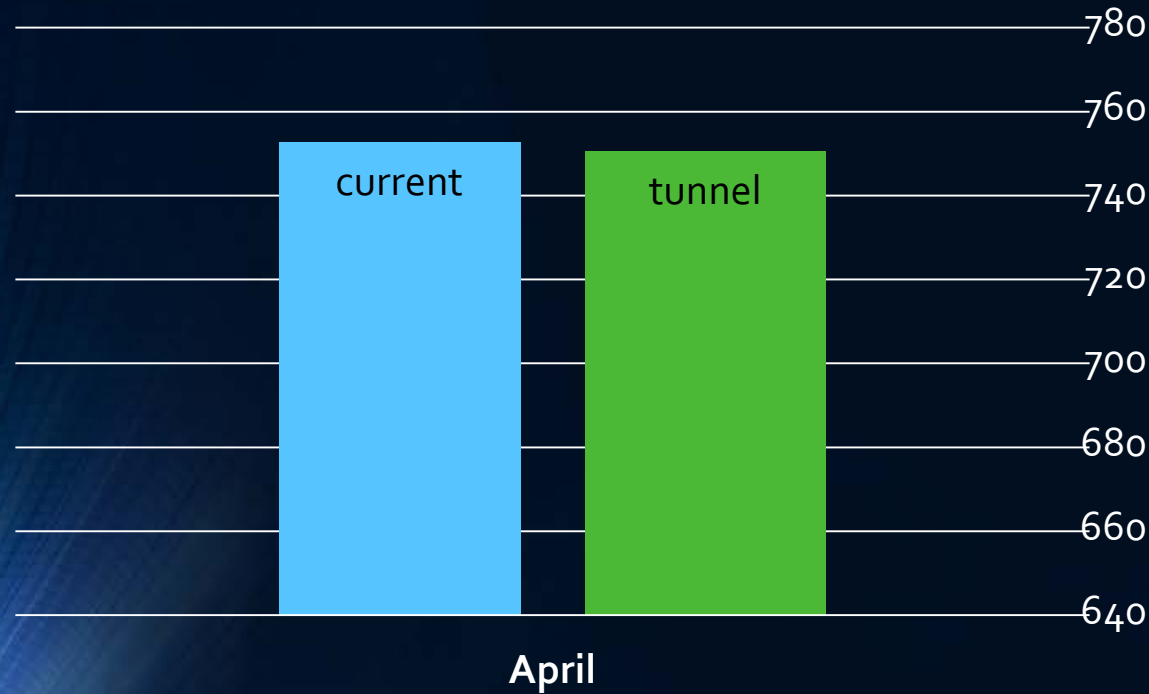




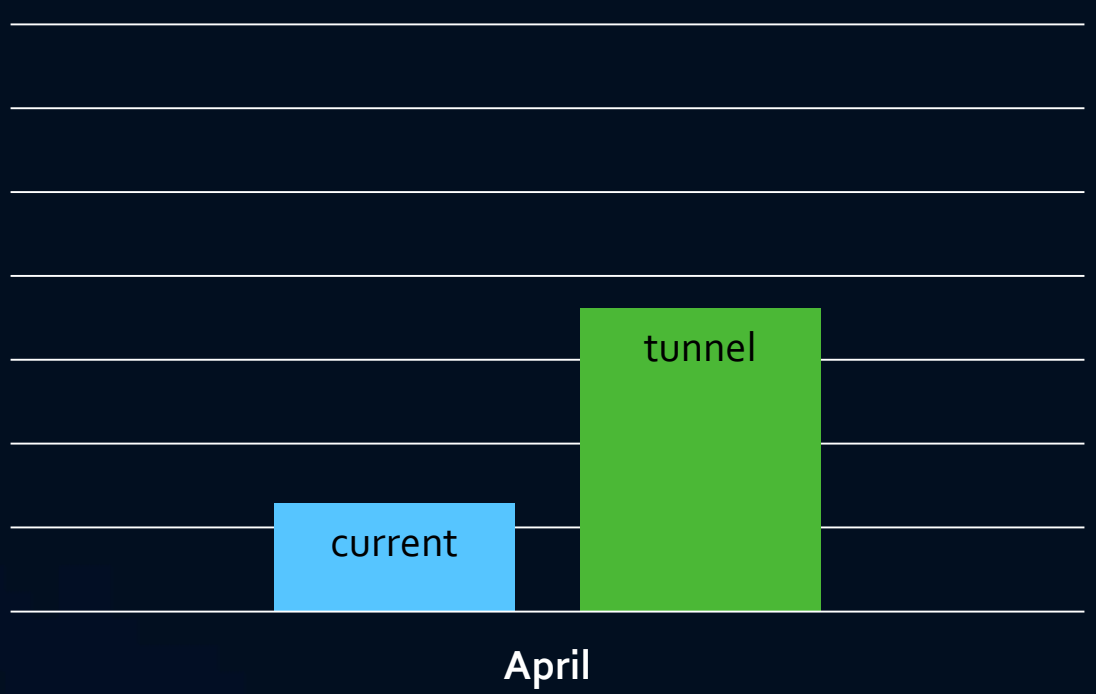
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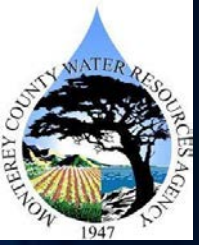
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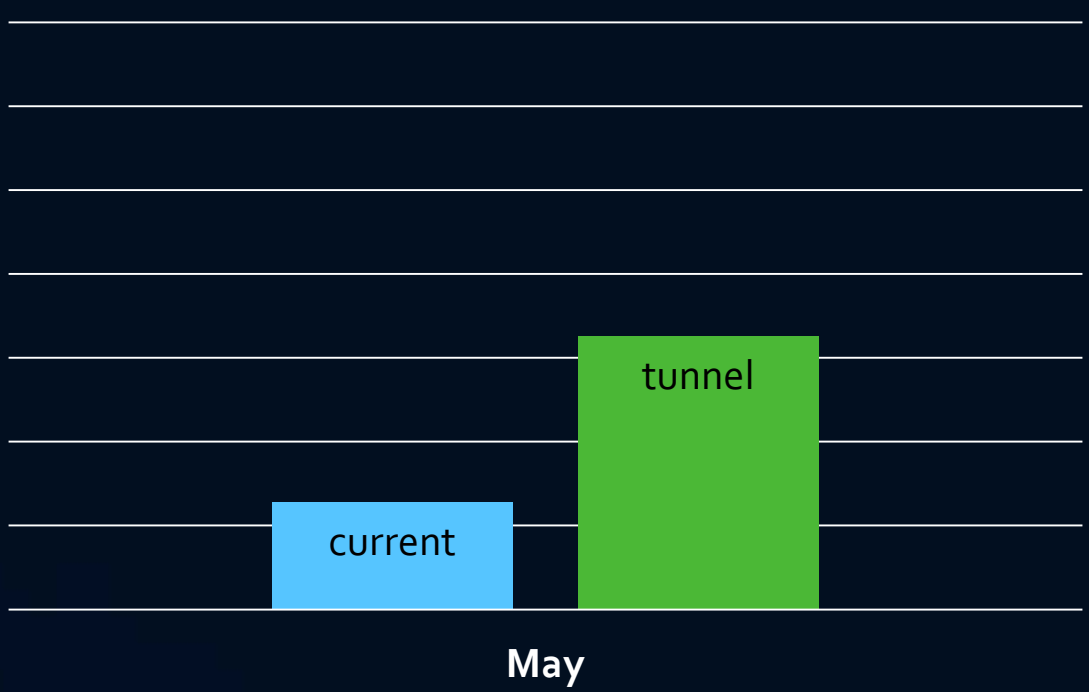
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### San Antonio

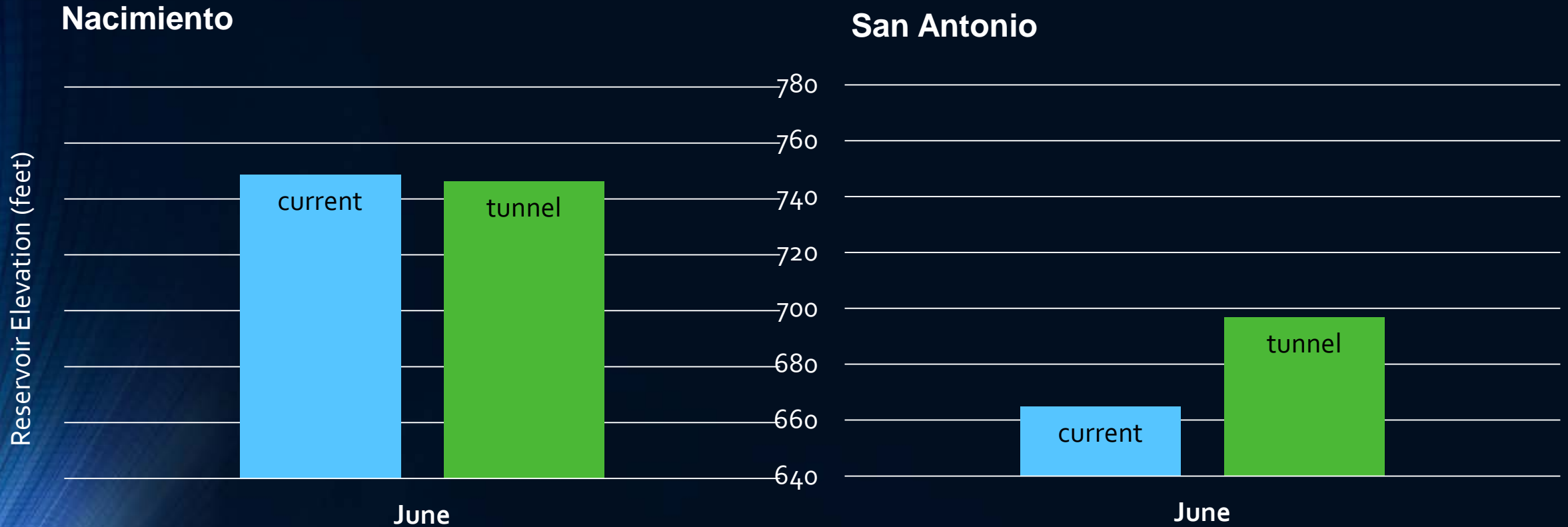


Reservoir Elevation (feet)



# Reservoir Elevations - Typical Dry Year

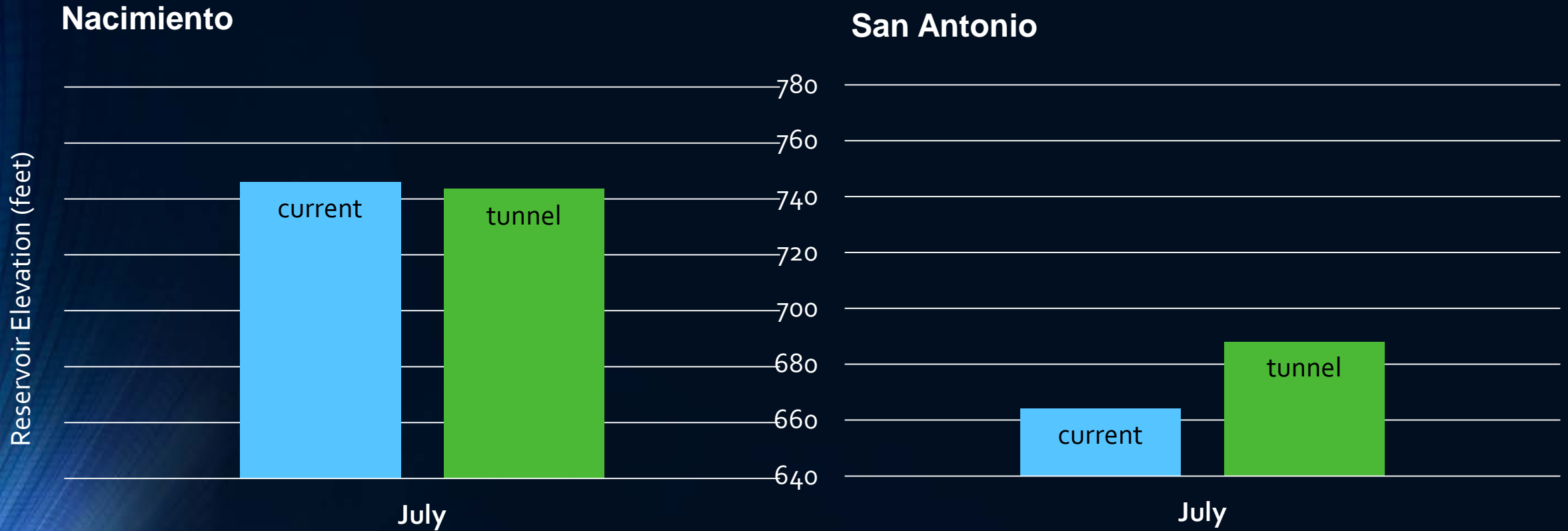
## Current operating procedure





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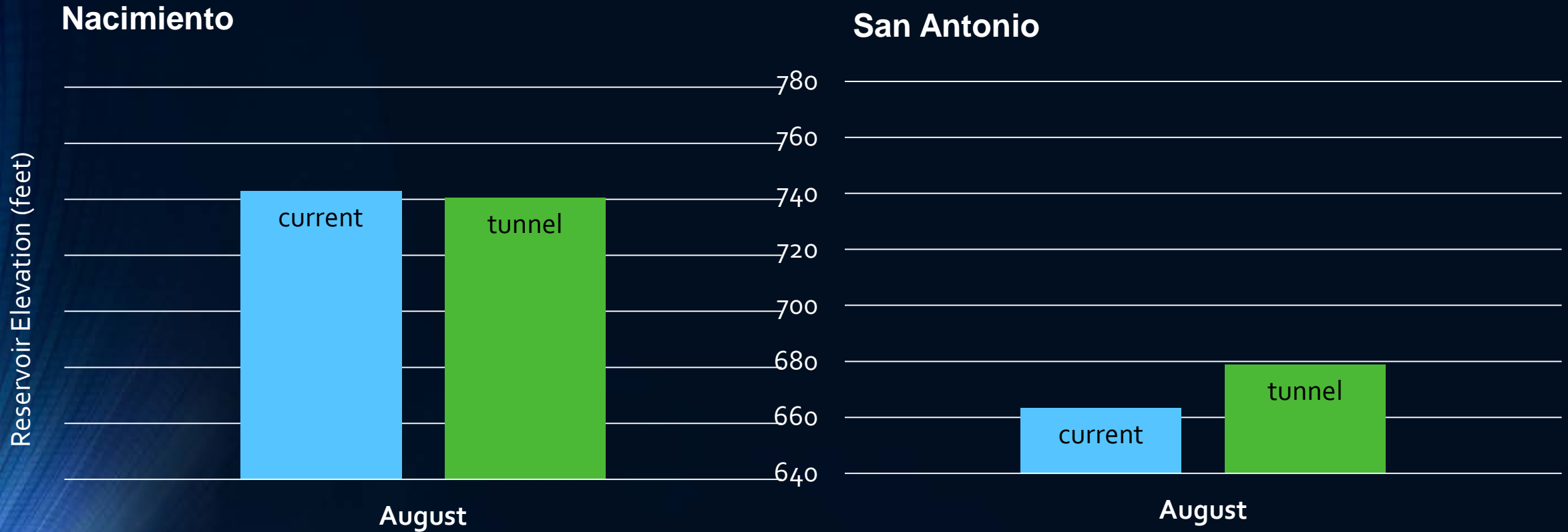


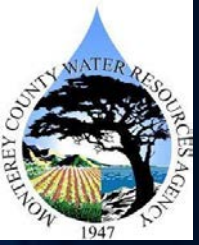




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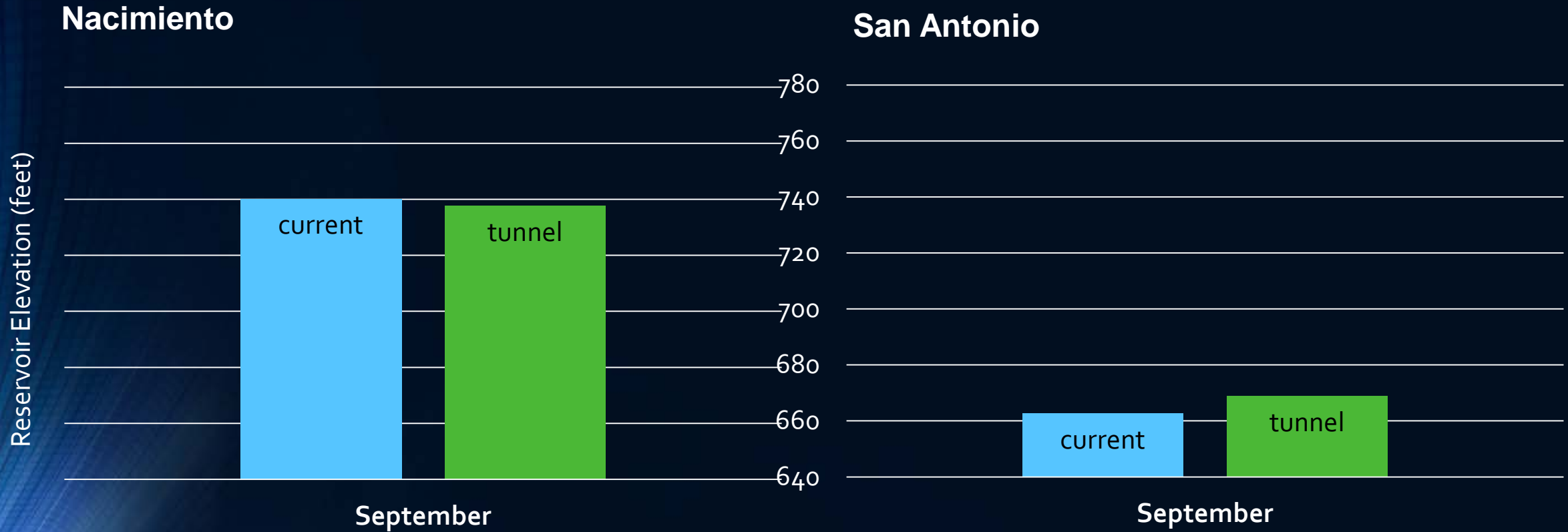
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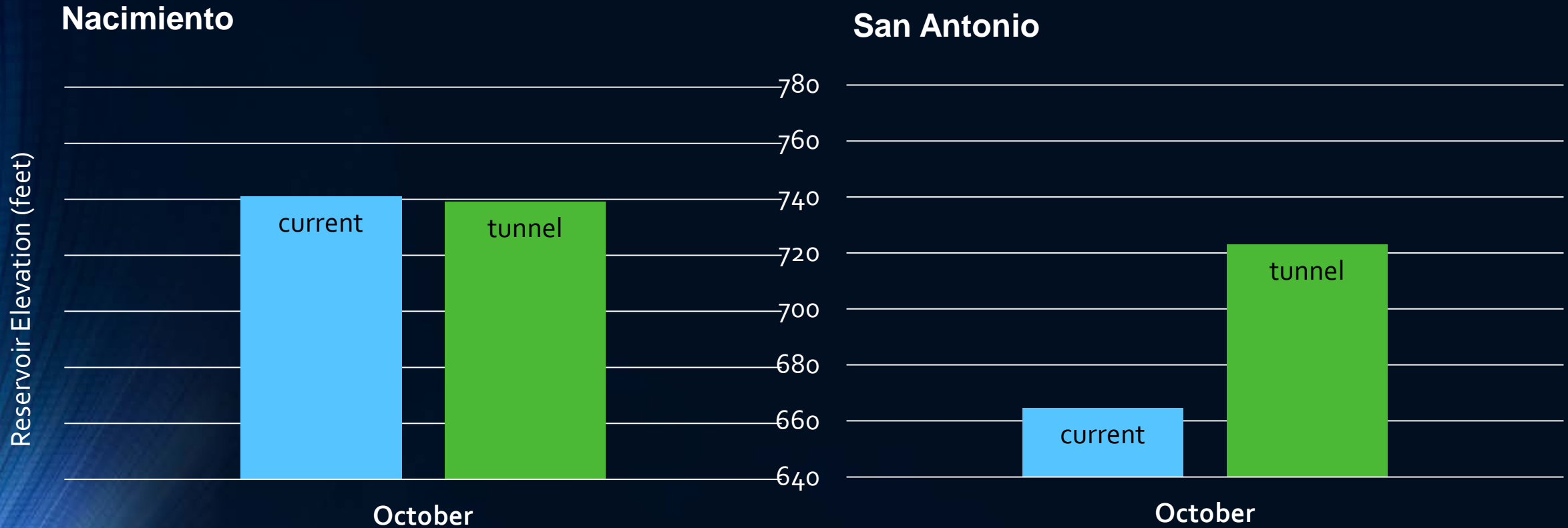
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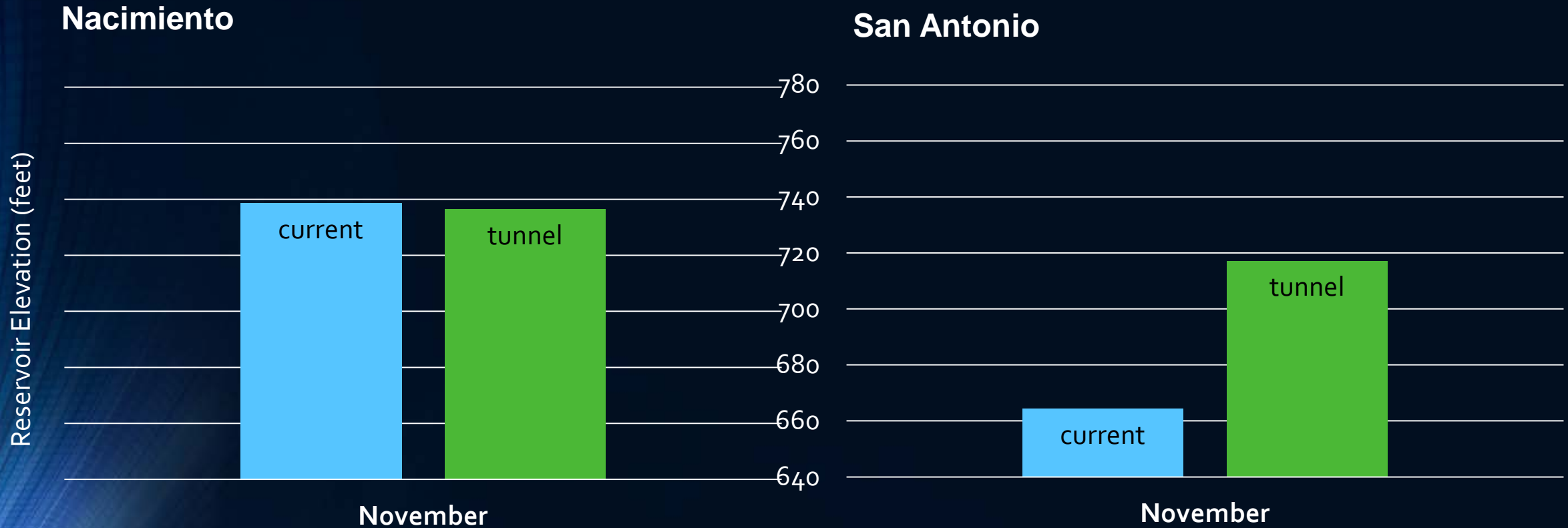


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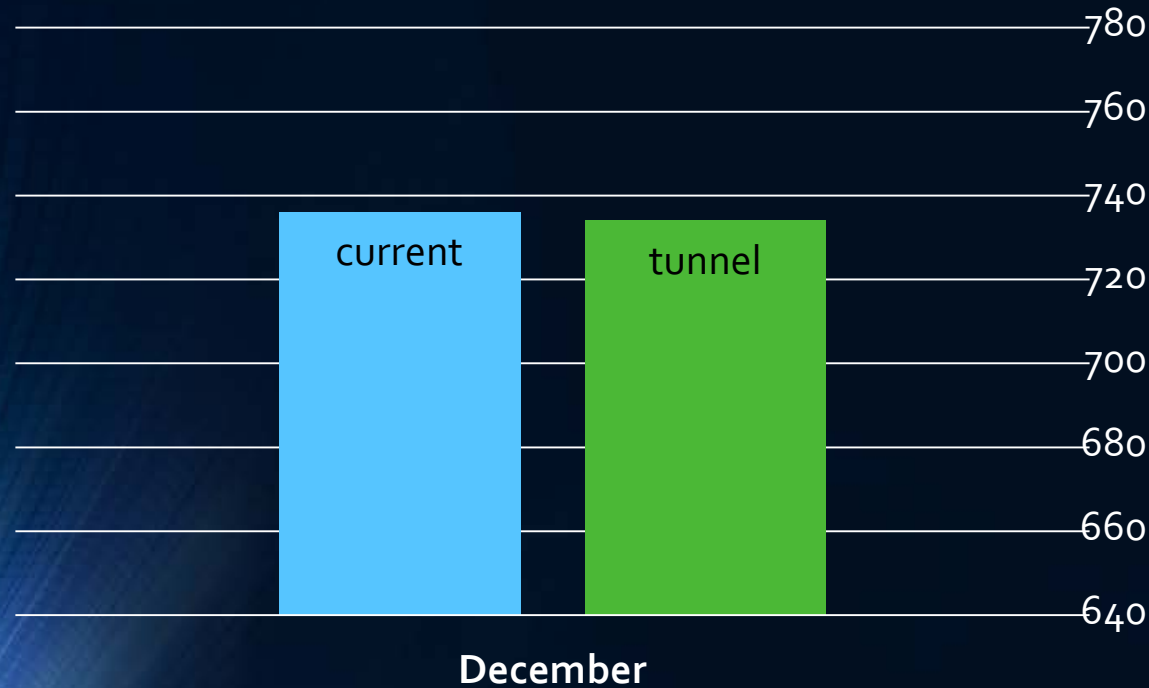
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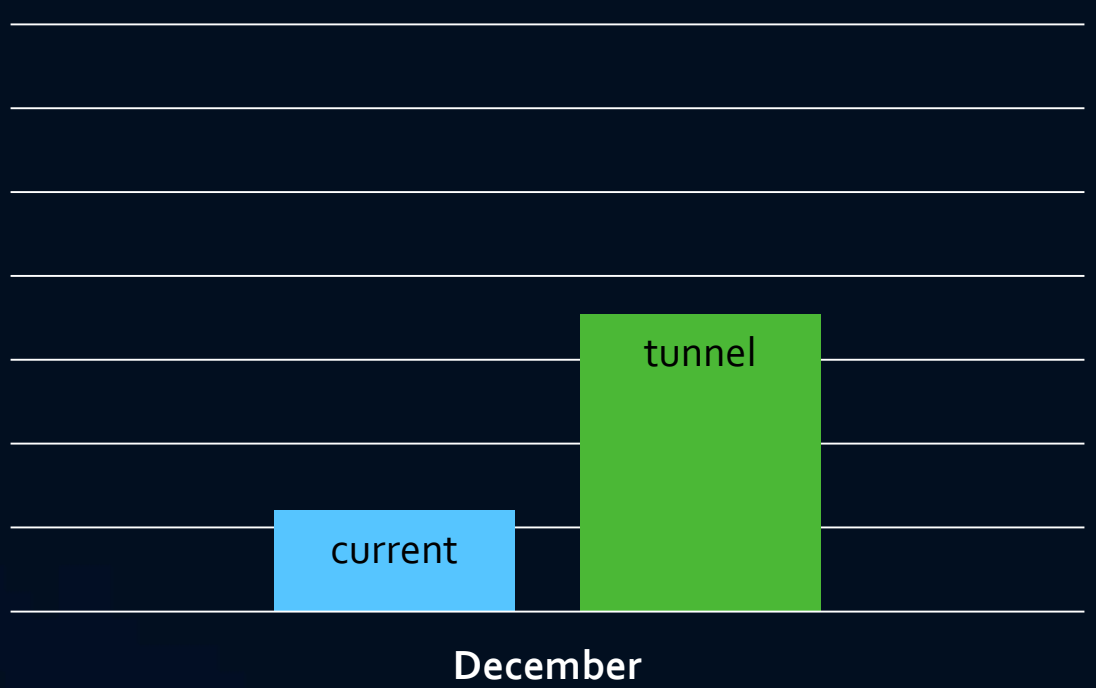


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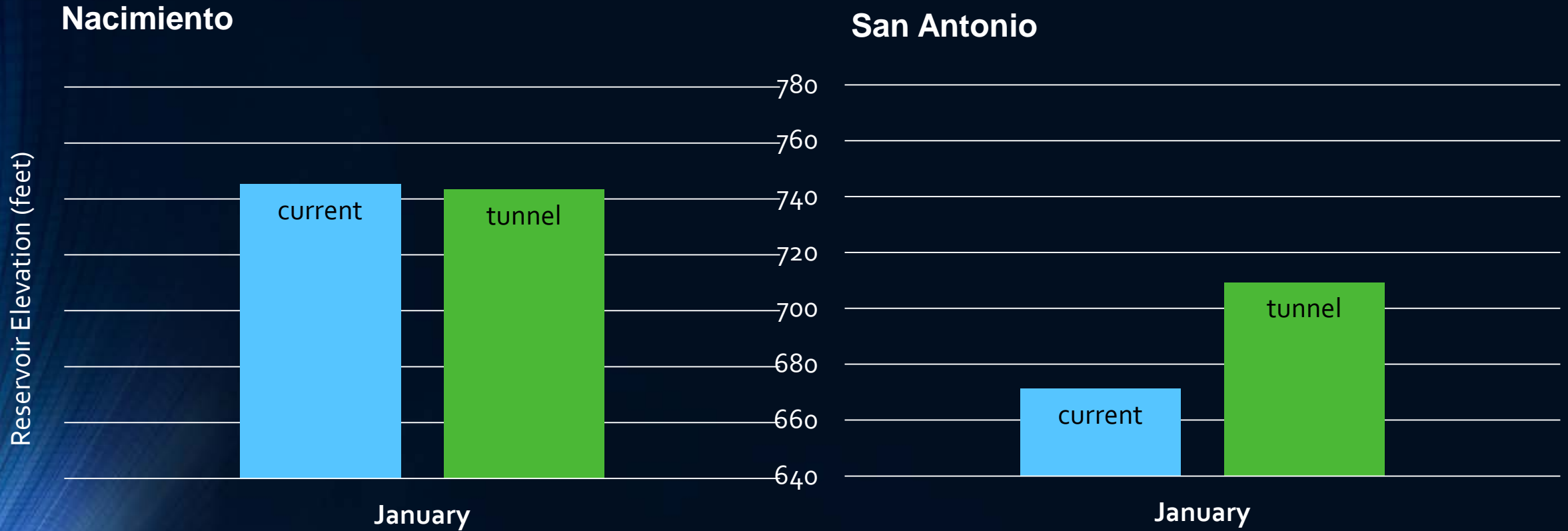


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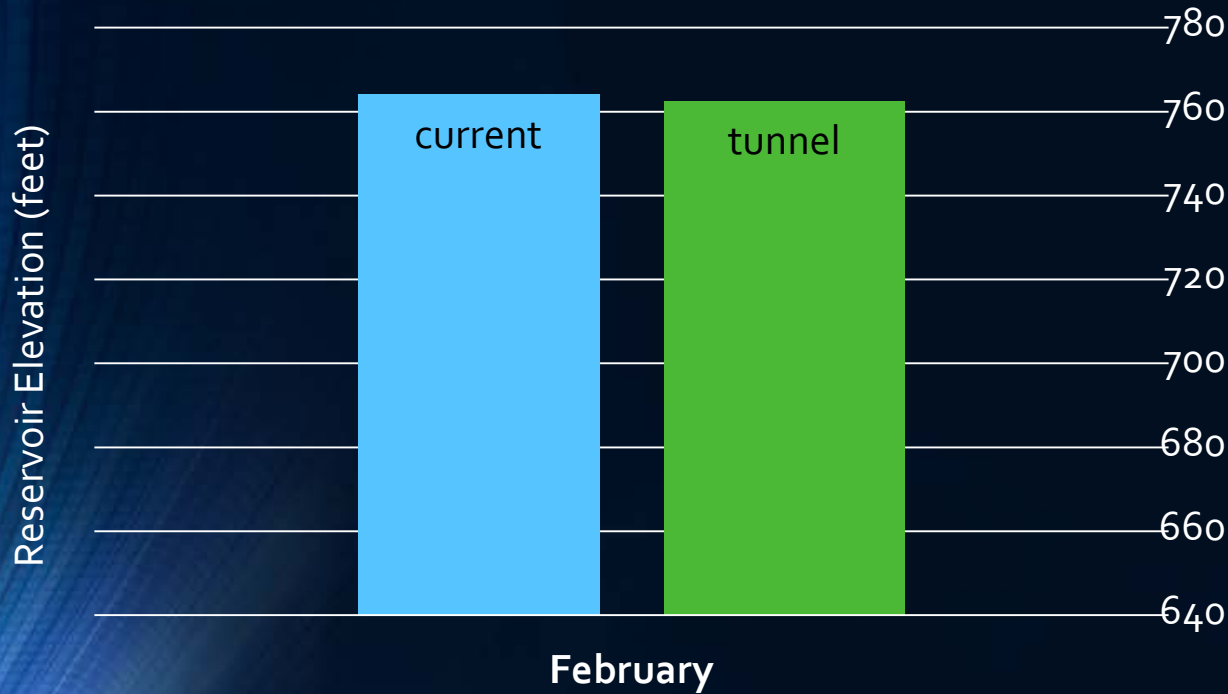
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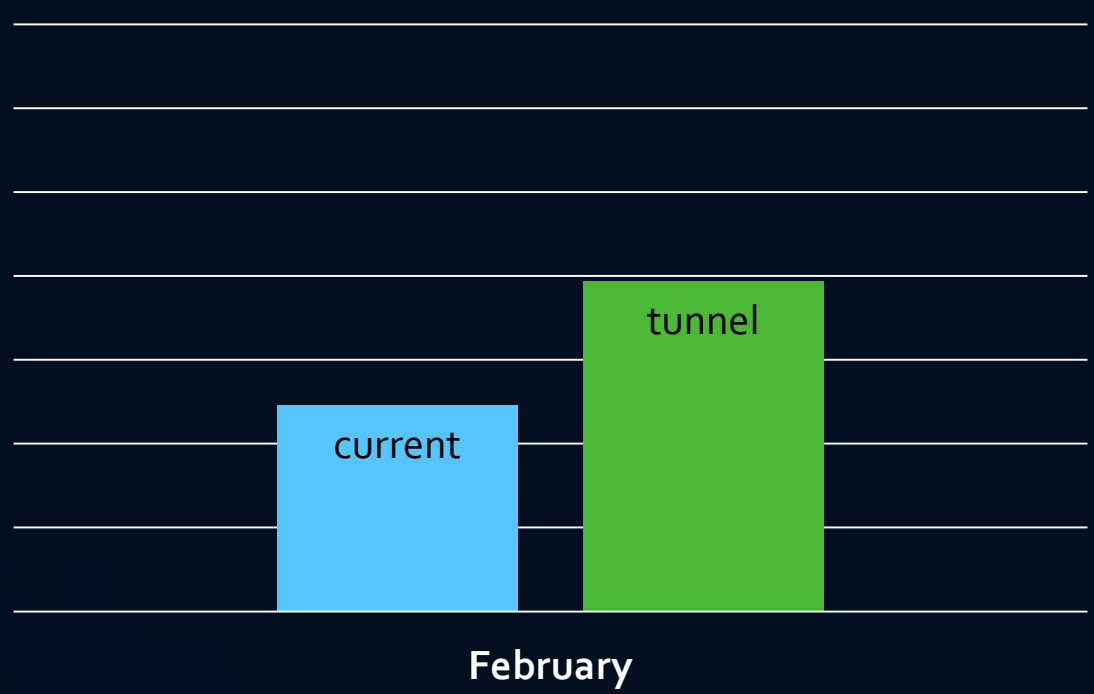


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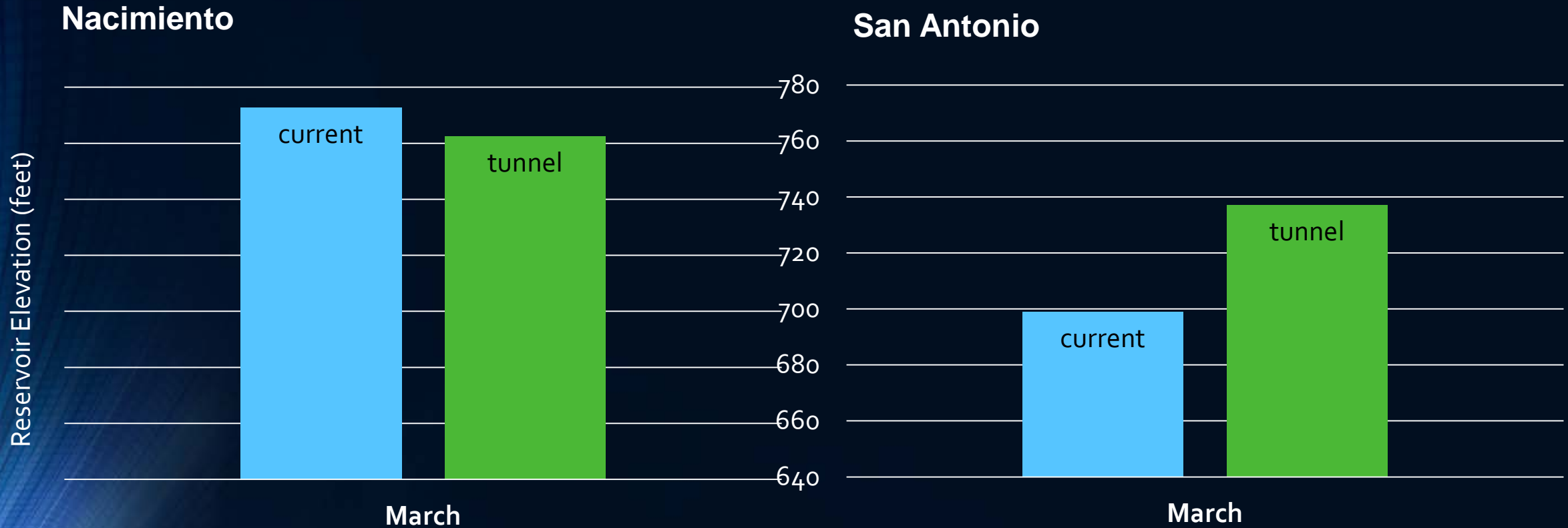


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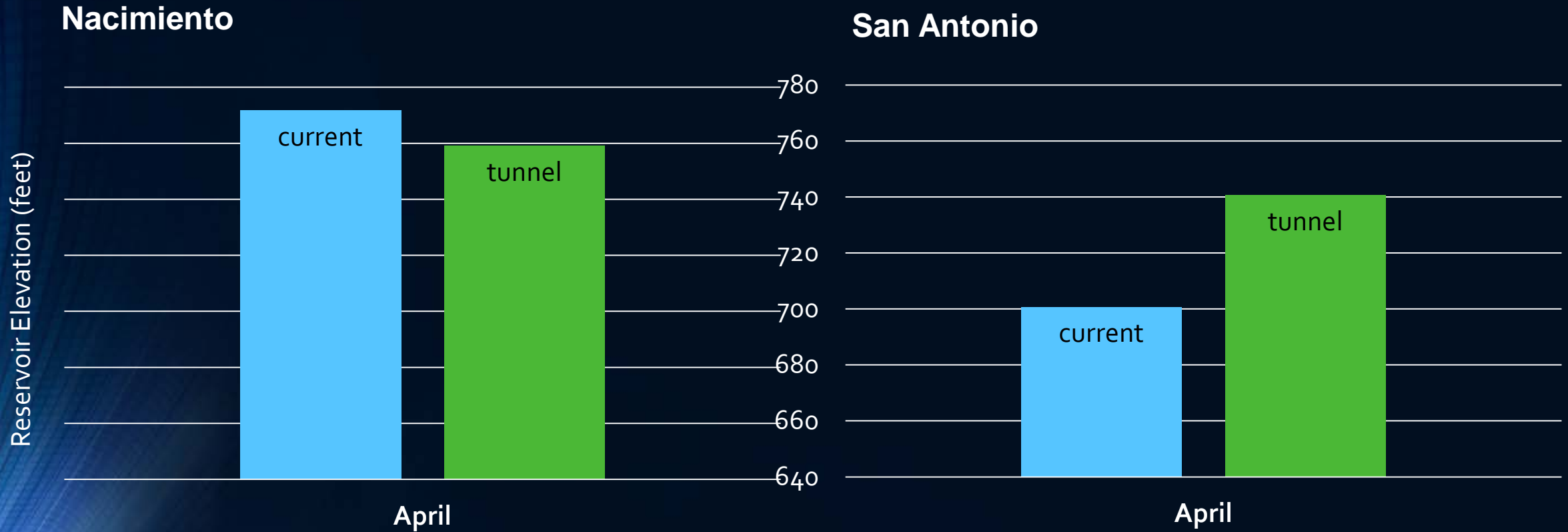
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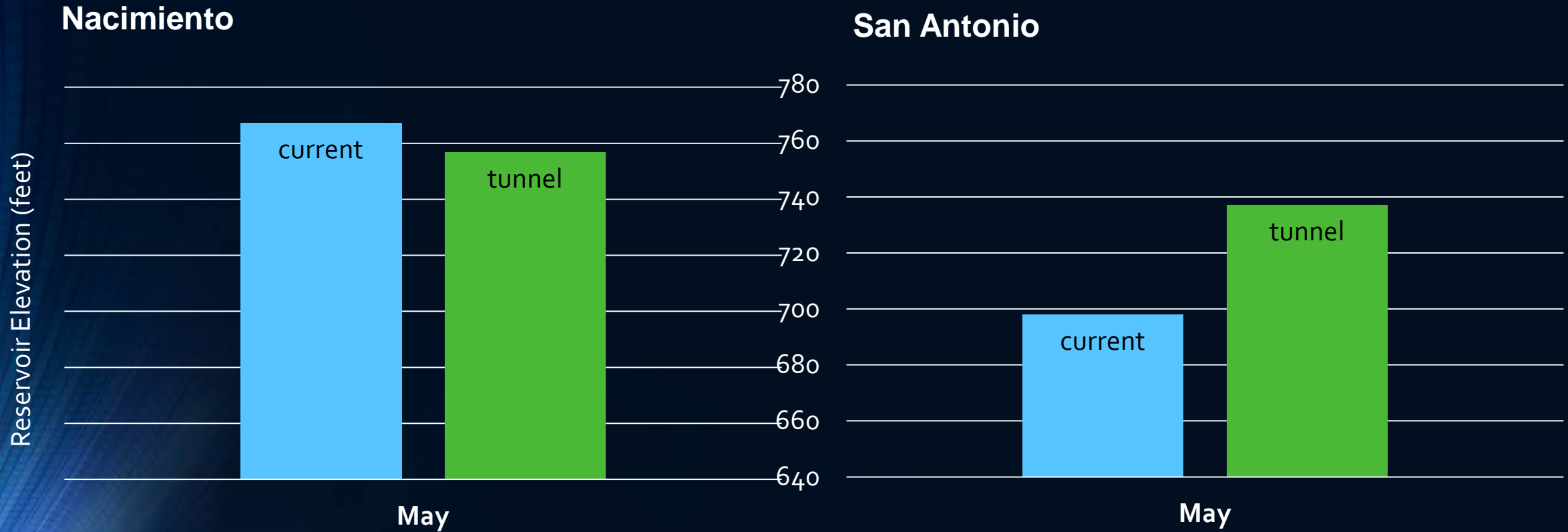


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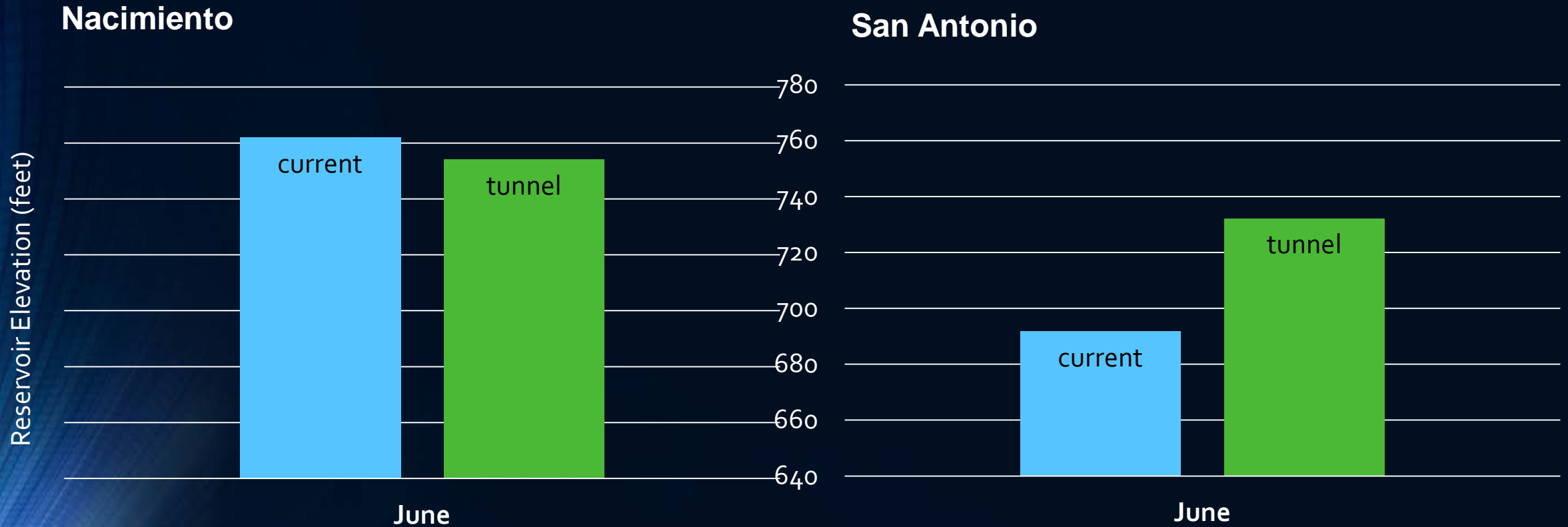


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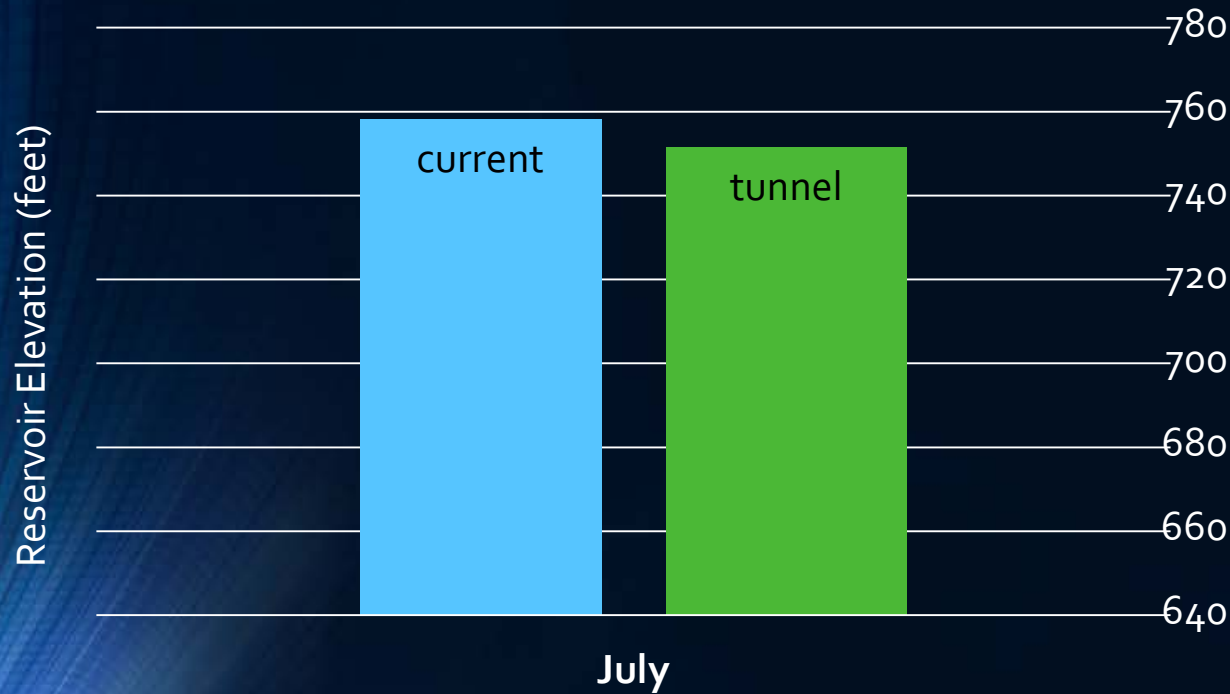
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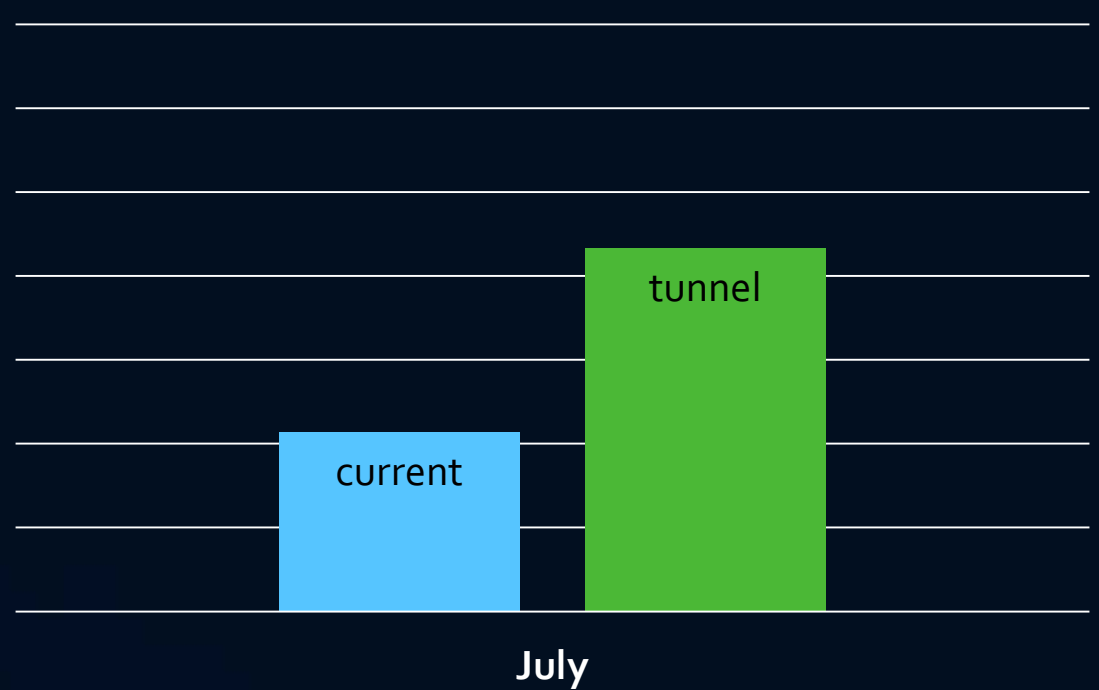


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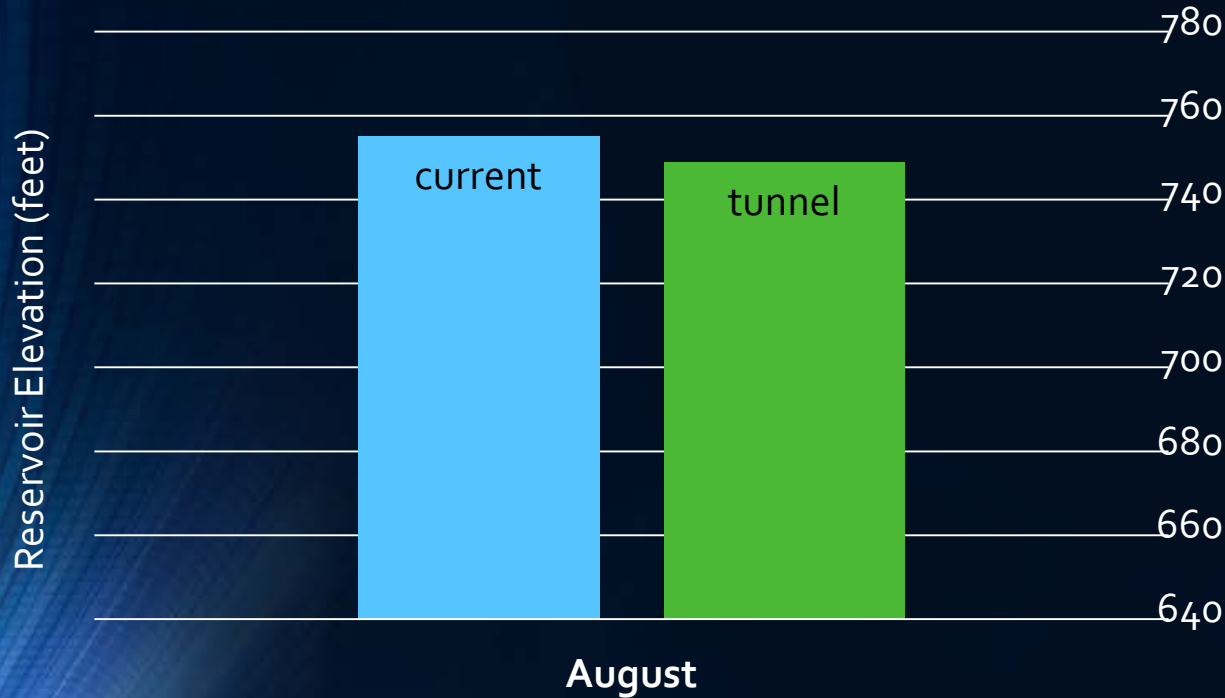
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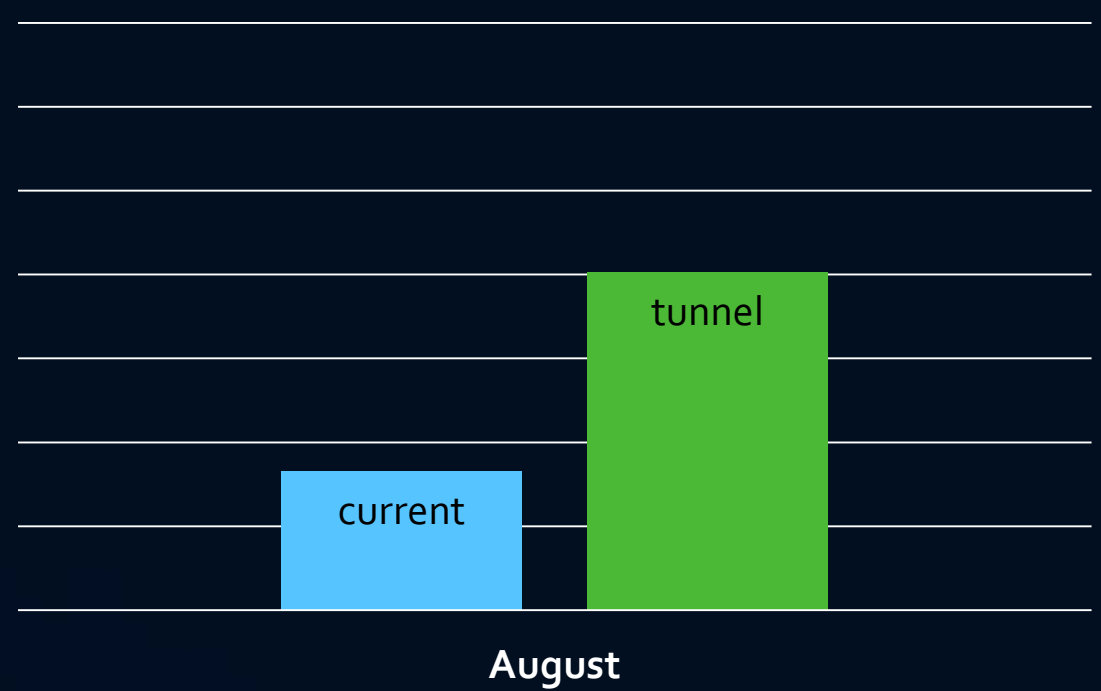


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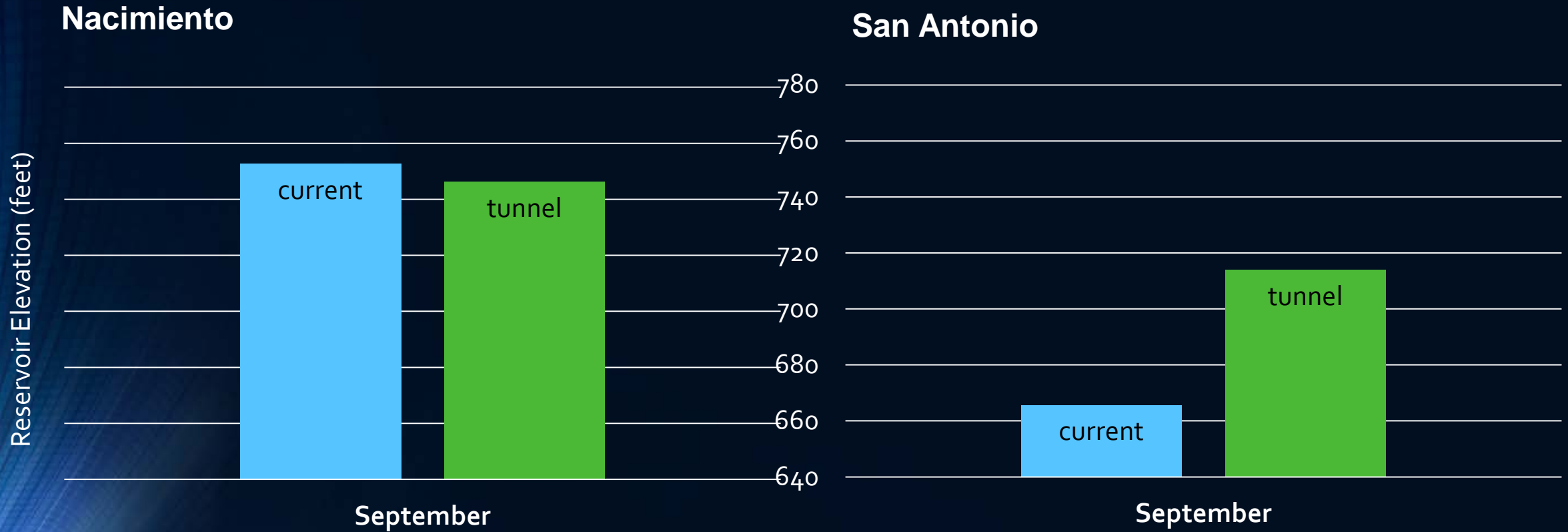


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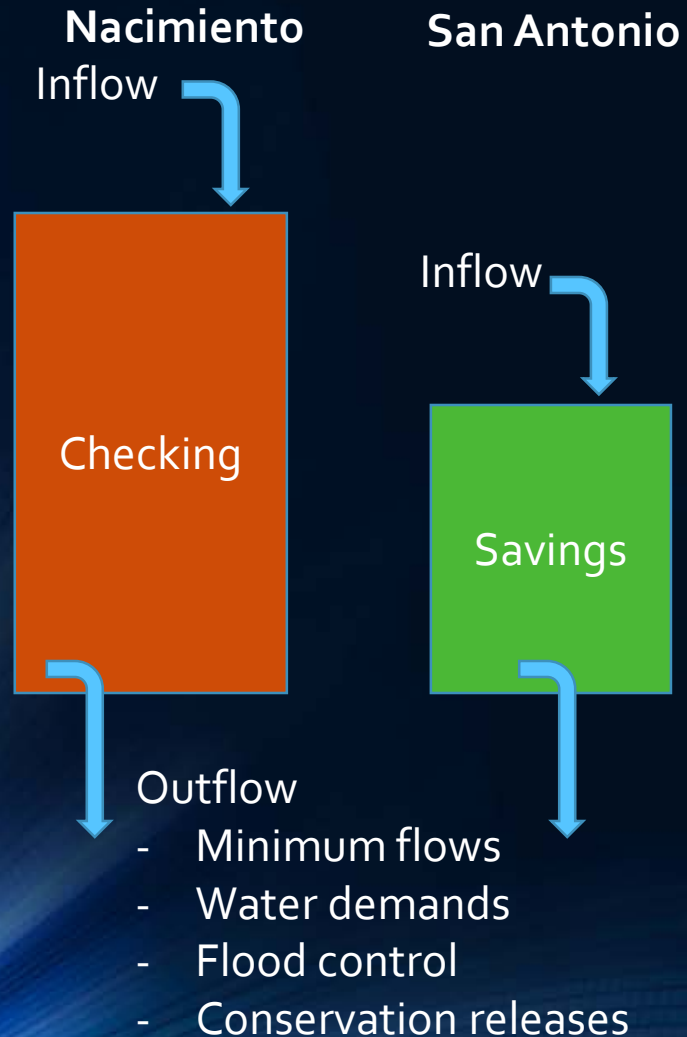
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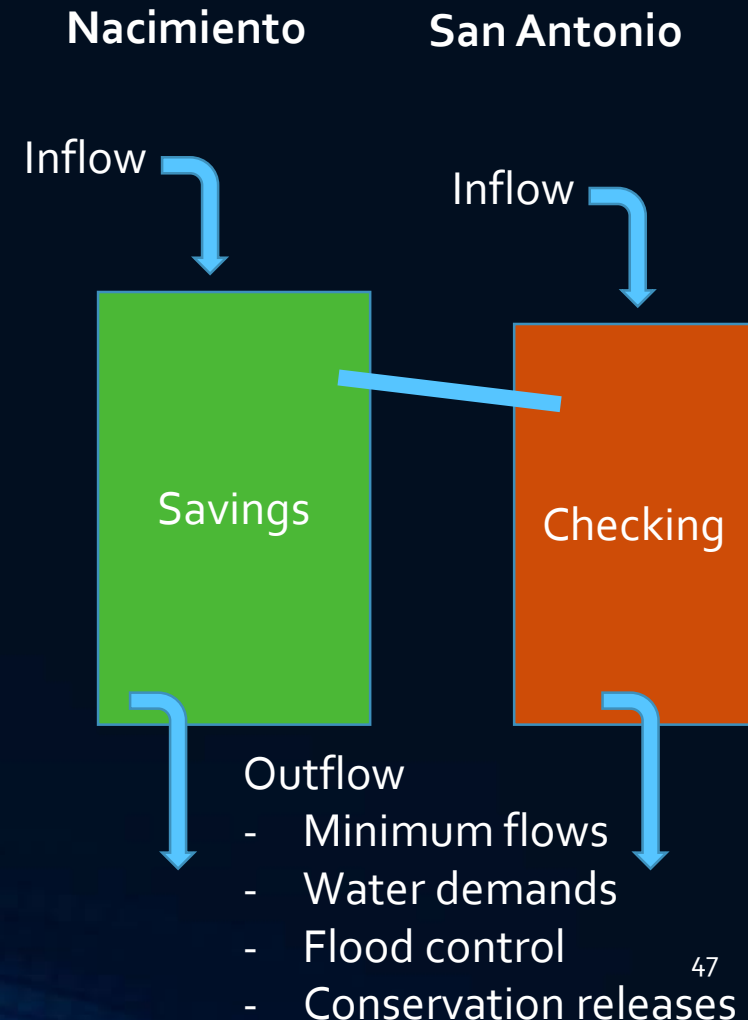


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## Current Operations

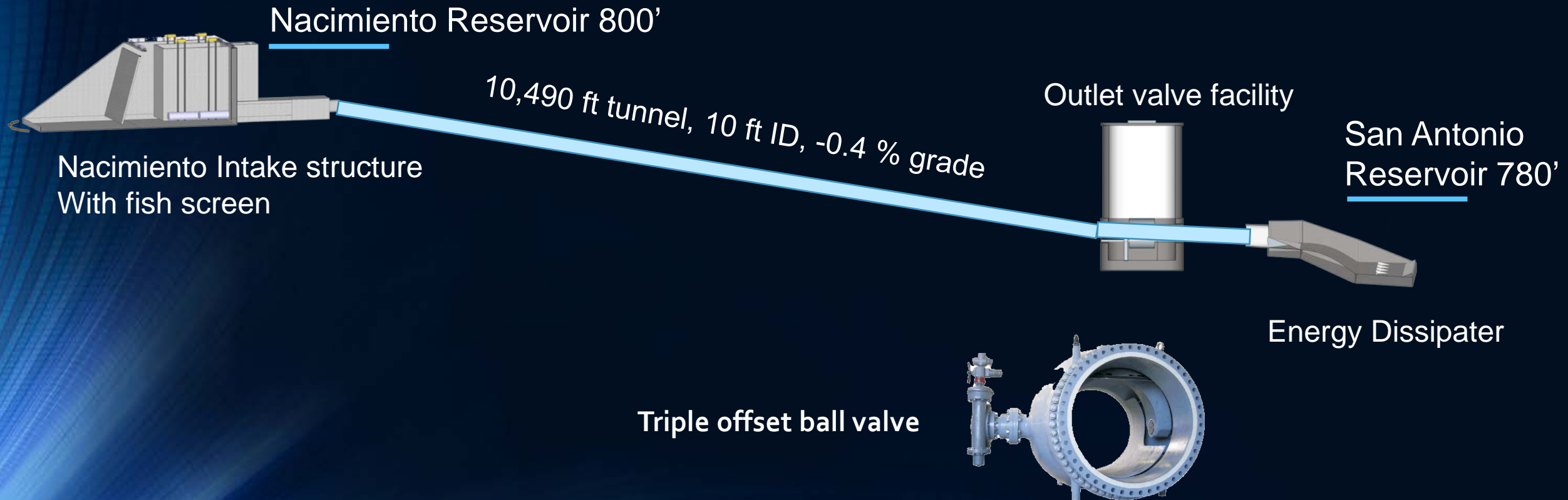


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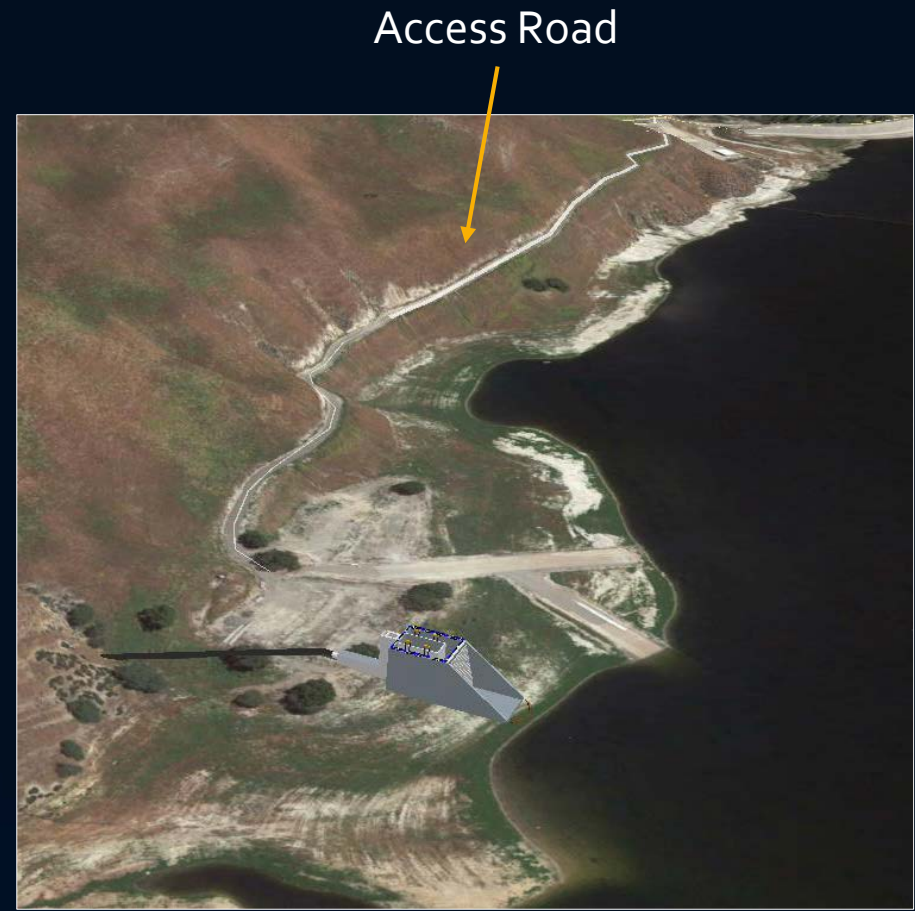


# Project Schematic





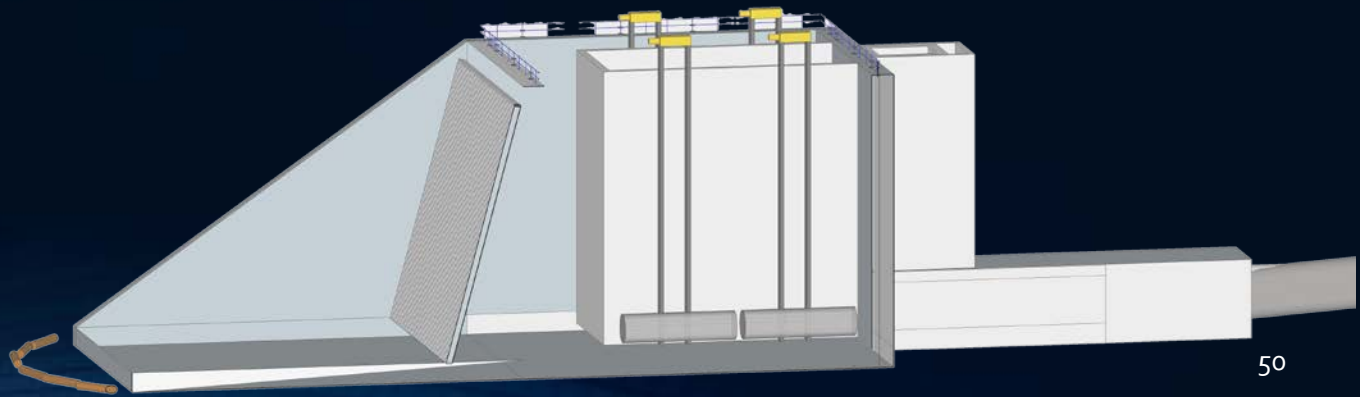
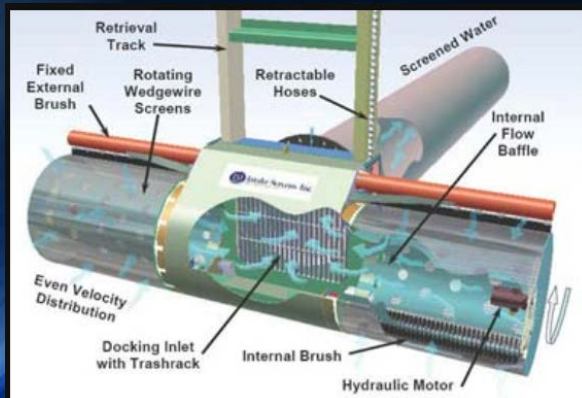
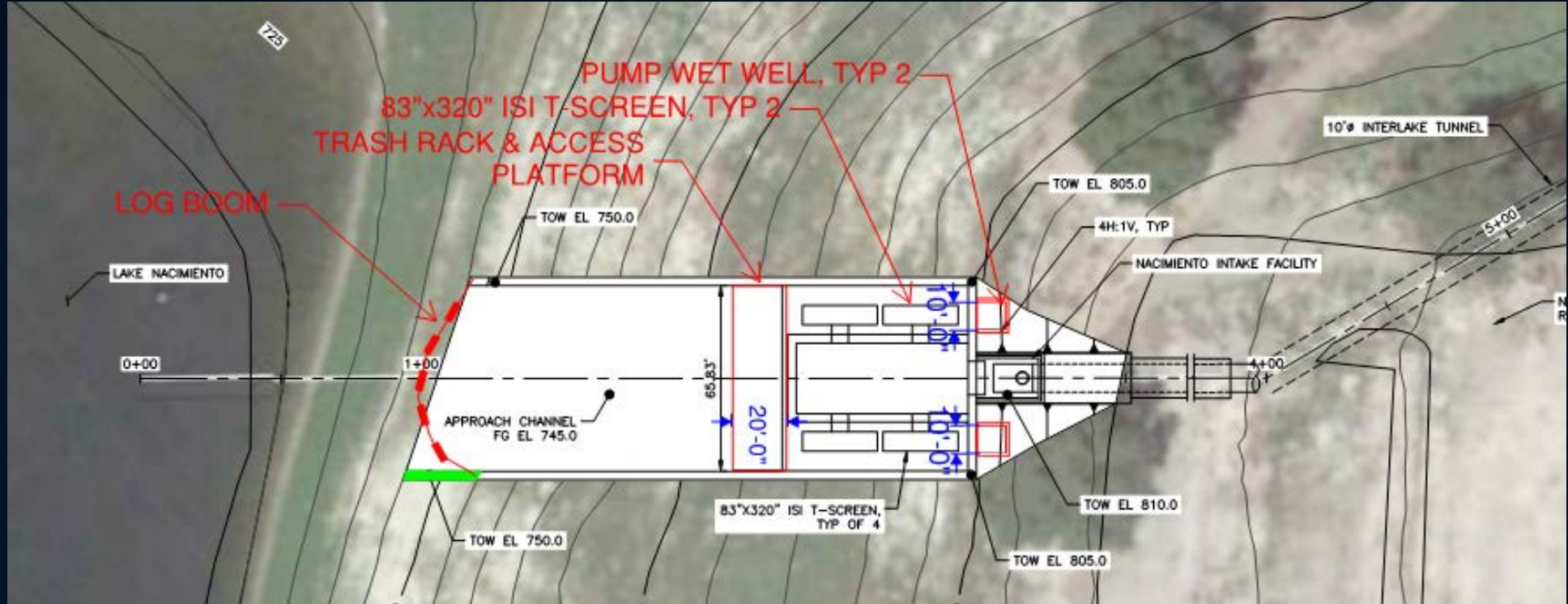
# Nacimiento intake structure – south portal



# Fish screens at Nacimiento intake

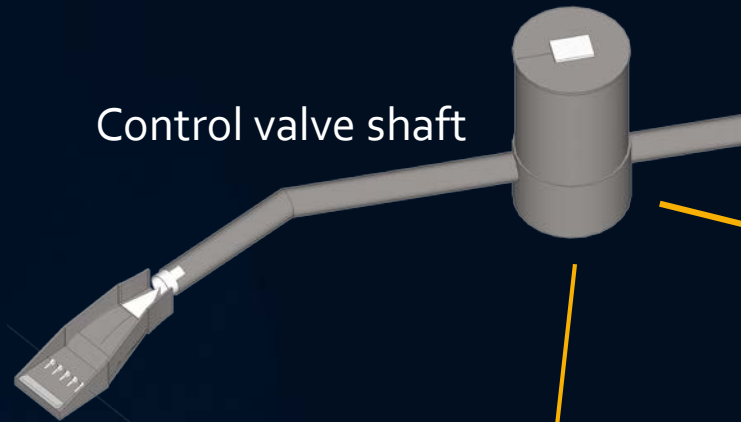


White Bass



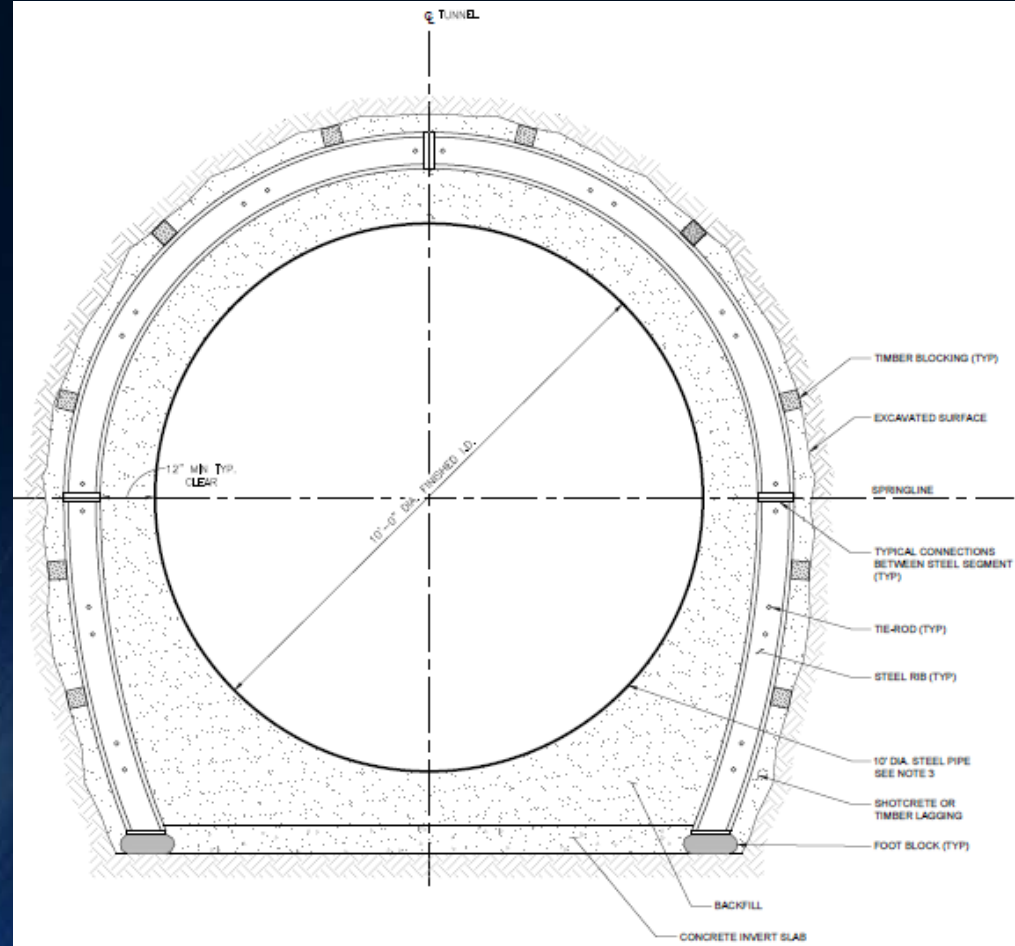


# San Antonio outlet facilities – north portal



# Tunnel cross sections – 10 feet ID

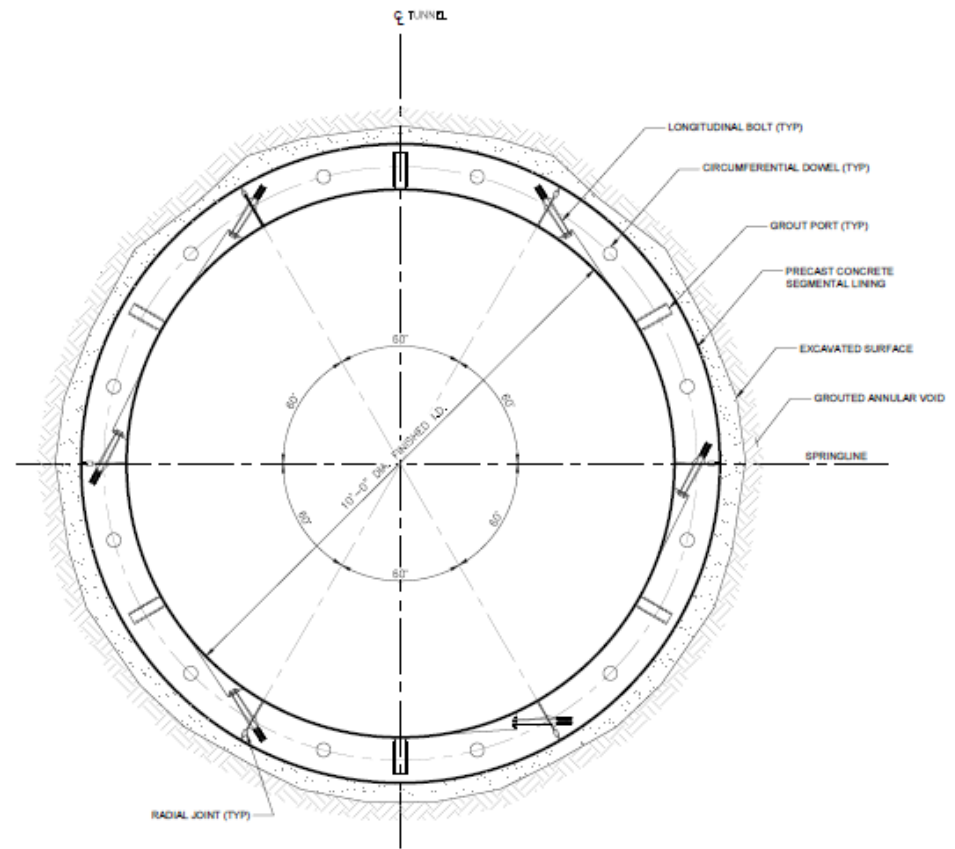
## Conventional Tunnel



CONVENTIONALLY MINED TUNNEL CROSS SECTION

SCALE: NTS

## Bored Tunnel

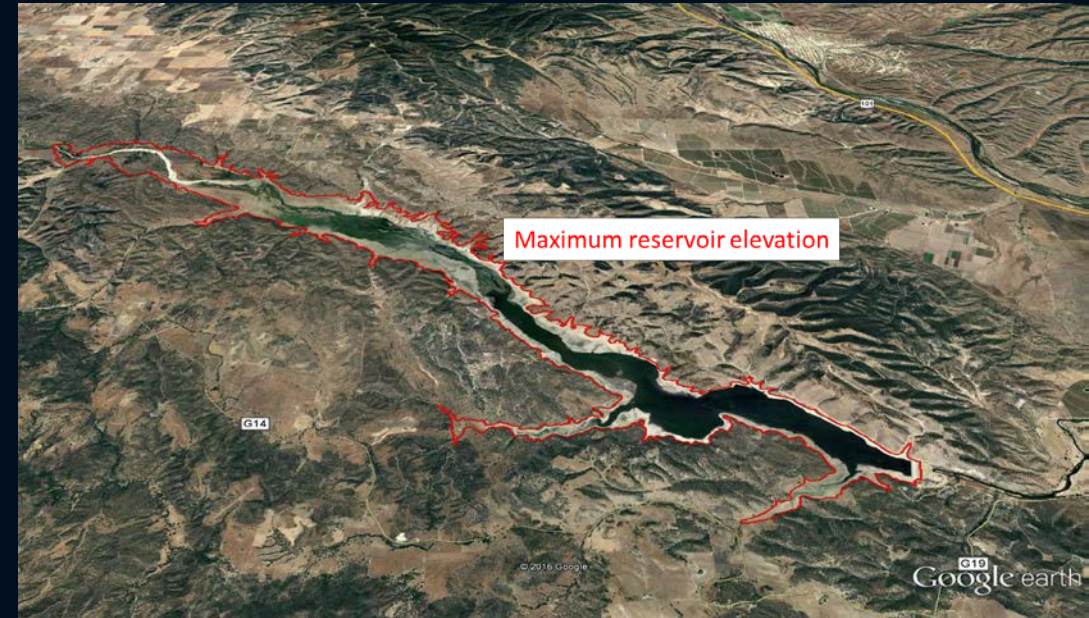
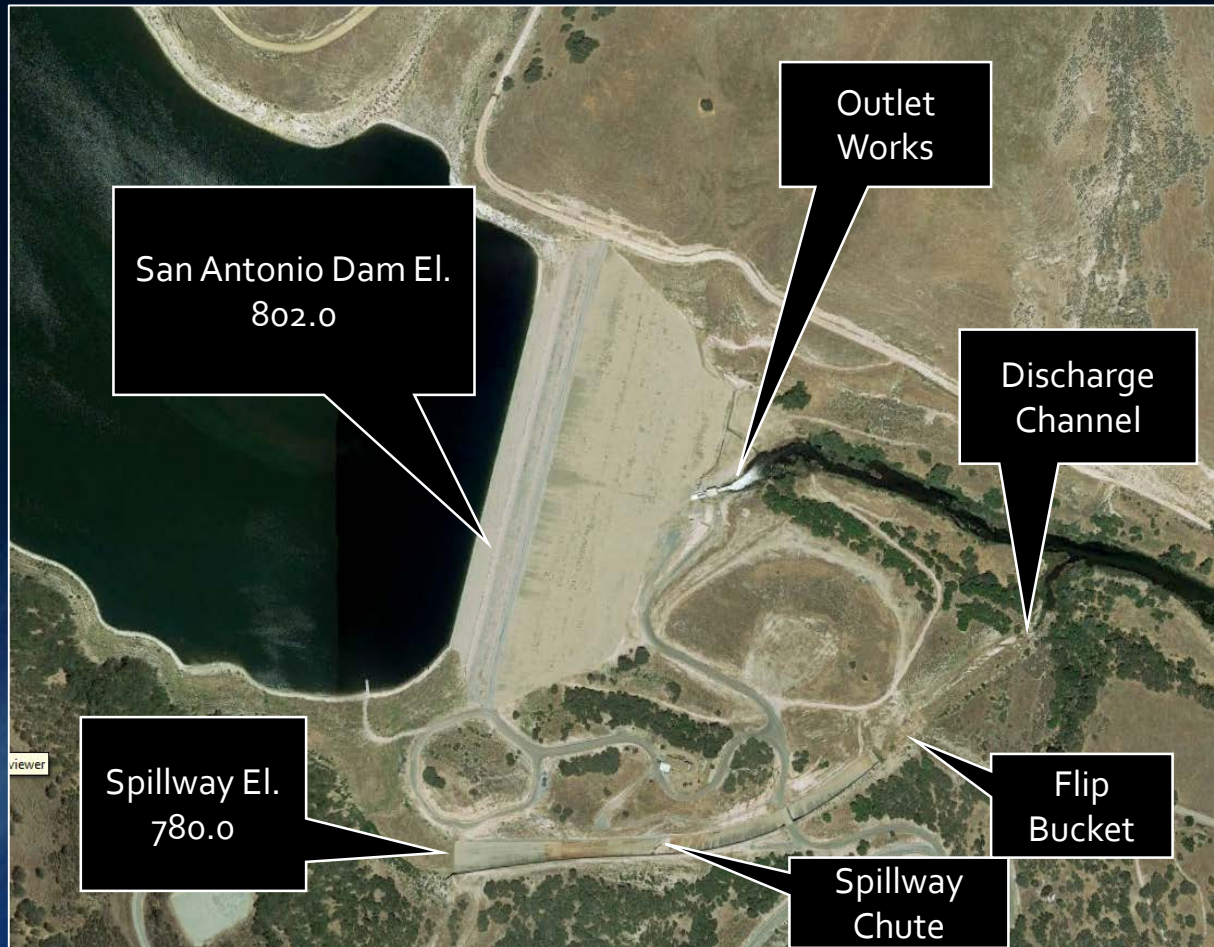


TBM MINED TUNNEL CROSS SECTION

SCALE: NTS

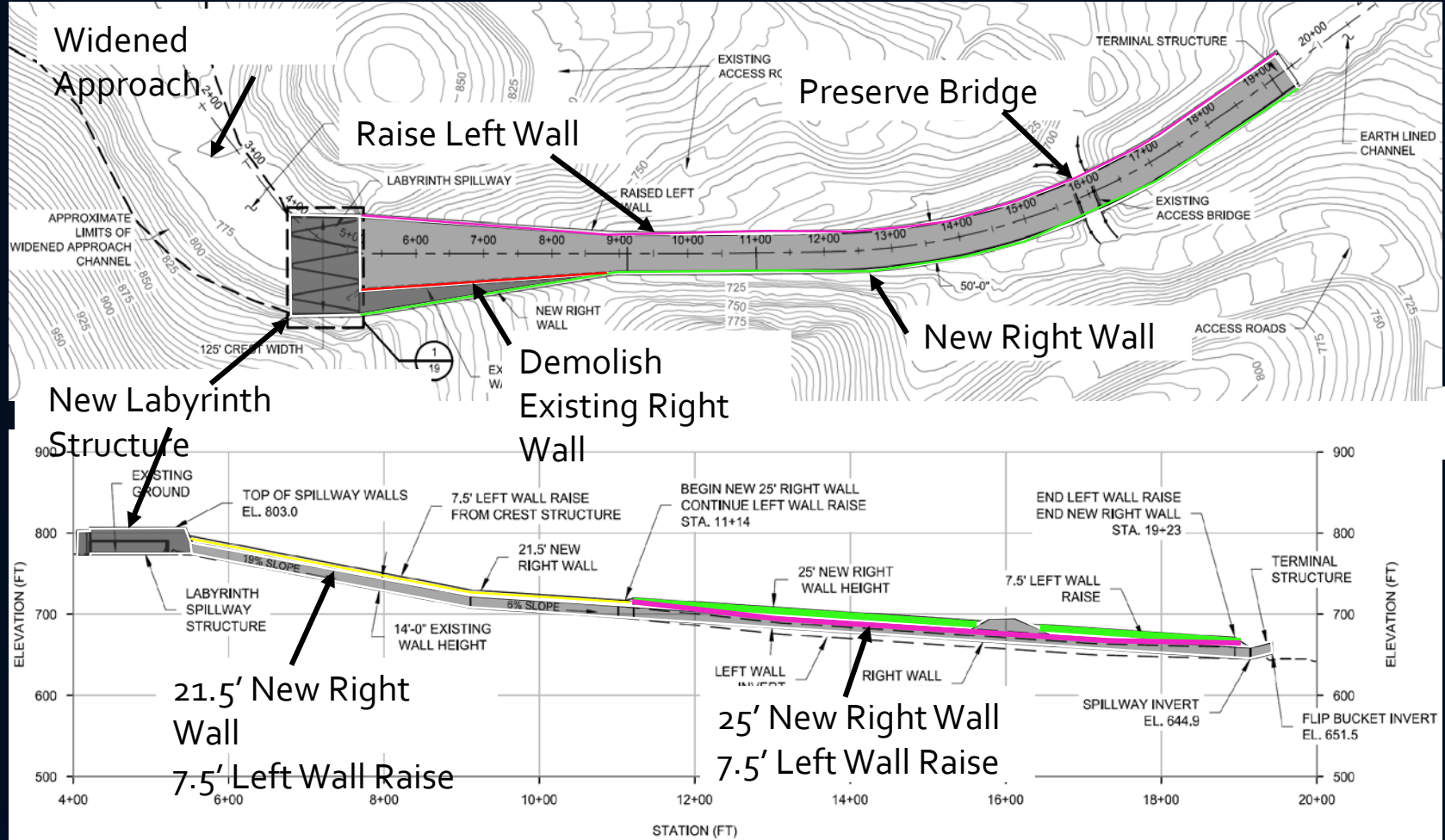
# San Antonio Spillway Modification

Raises spillway 7 feet

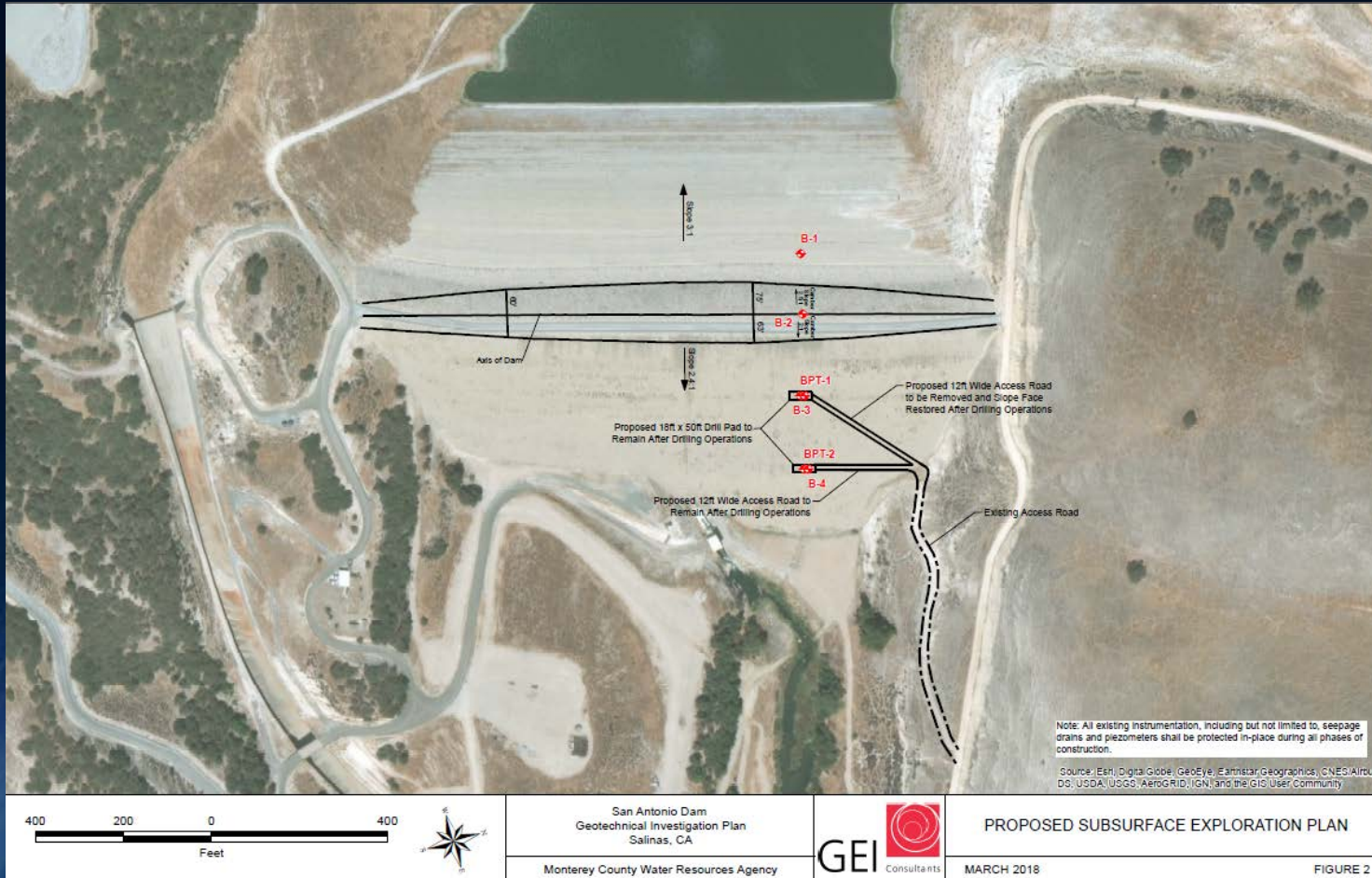


Adds 41,500 AF increased storage to San Antonio Reservoir

# Preferred spillway modification concept



# San Antonio Dam Stability Analysis



Geotechnical drilling of San Antonio dam required to confirm soil strengths for calculation of dam stability.

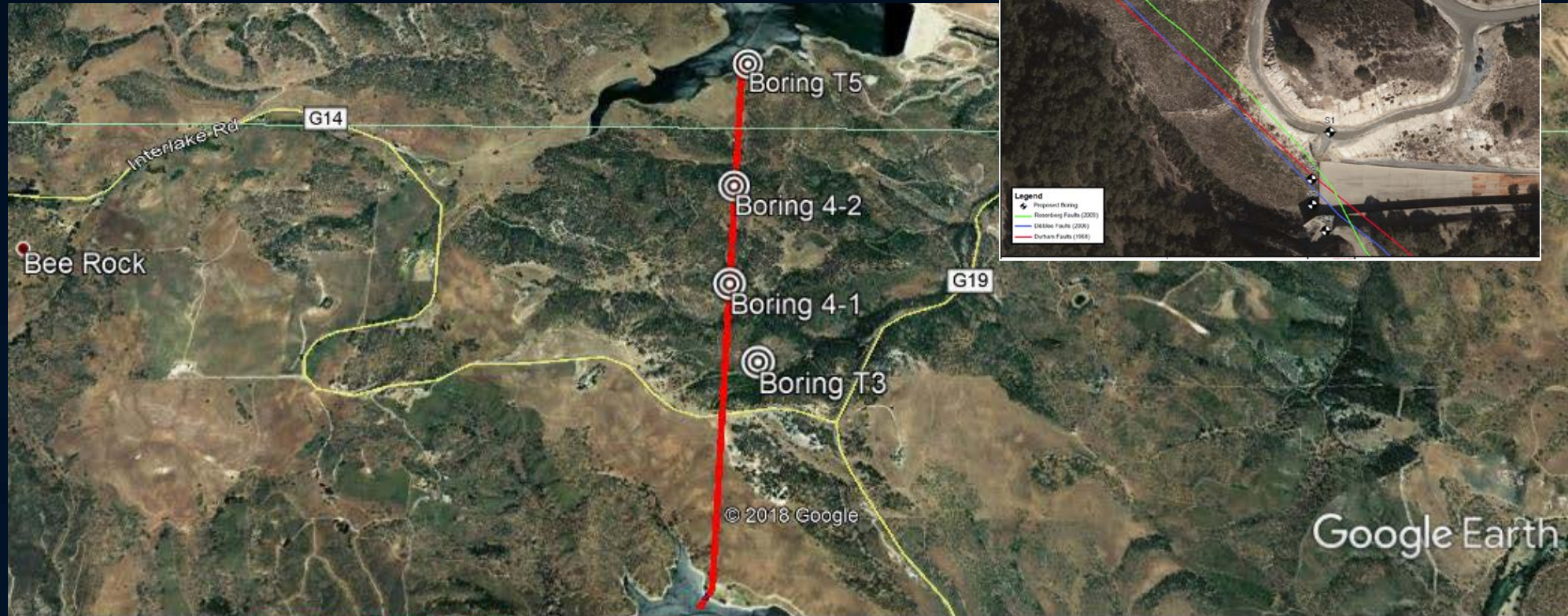


# Geotechnical exploration

Tunnel – 6 borings  
( 4 completed)

Test pits

Spillway – 4 borings







# Ground water

Ground water occurs within the fractured shales and claystones.

Local to the tunnel environment, ground water aquifers supply private wells for residential and agricultural use.



Priority for well avoidance and protection of ground water supply

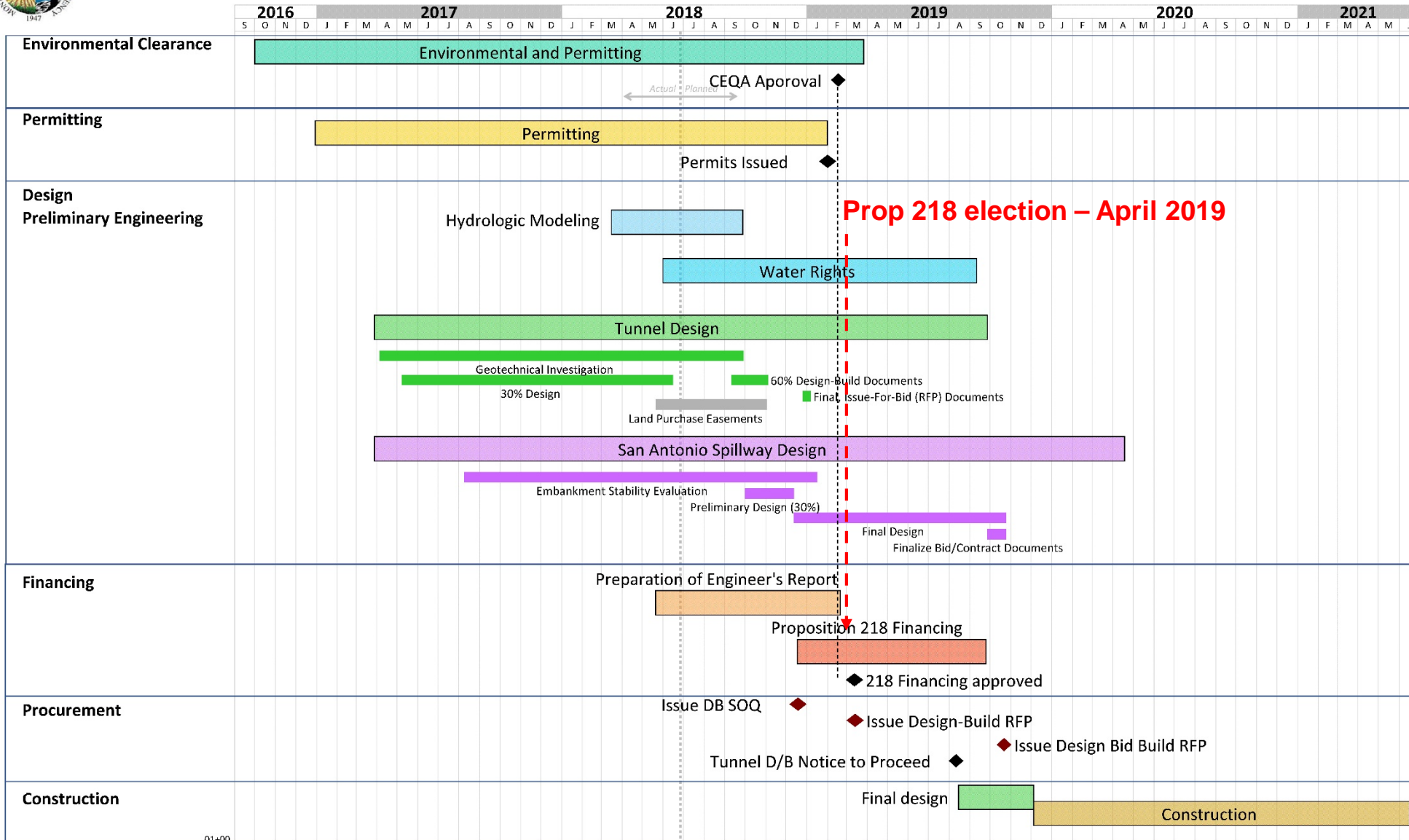


# Work Accomplished to Date

1. Environmental clearance work and preparing of Draft EIR.
  - Completed environmental field studies.
  - Completed environmental clearance for field activities.
  - Initial meetings with State and Federal regulatory permitting agencies
2. Initiated geotechnical exploration for tunnel and spillway modification.
3. Commenced tunnel design – 30% complete June 2018
  - Coordinated with CDFW on fish screen design criteria and preparation of an MOA
4. Conducted alternatives analysis for spillway modification project
  - Coordinated with DSOD for stability analysis
5. Completed USGS hydrologic model and began baseline model runs
6. Coordination with DWR regarding grant administration and request for time extension.



# Interlake Tunnel and Spillway Modification



01+00



# DWR Grant – Use of Funds

Task	Report summary	Baseline Cost	Actual Costs to Date	Budget remaining	ACTUAL % COMPLETE
	<b>DWR Grant</b>	\$10,000,000.00	\$3,291,704.53	\$6,708,295.47	33%
<b>A</b>	<b>Project Administration</b>	\$2,374,858.00	\$1,414,522.06	\$960,335.94	60%
<b>B</b>	<b>Land Purchase Easements</b>	\$244,000.00	\$0.00	\$244,000.00	0%
<b>C</b>	<b>Planning / Design / Engineering and Environmental</b>	\$7,381,142.00	\$1,877,182.47	\$5,503,959.53	25%
<b>C.1</b>	<b>Hydrologic Modeling</b>	\$532,691.00	\$16,559.05	\$516,131.95	3%
<b>C.2</b>	<b>Environmental and Permitting</b>	\$1,527,632.00	\$432,286.74	\$1,095,345.26	28%
<b>C.3</b>	<b>Water Rights</b>	\$550,000.00	\$4,420.00	\$545,580.00	1%
<b>C.4</b>	<b>LiDAR Survey</b>	\$170,000.00	\$132,188.00	\$37,812.00	78%
<b>C.5</b>	<b>San Antonio Spillway Design</b>	\$1,766,692.00	\$373,194.33	\$1,393,497.67	21%
<b>C.6</b>	<b>Tunnel Design</b>	\$2,834,127.00	\$918,534.35	\$1,915,592.65	32%



# Capital Budget / 218 Financing

Description	Budget \$M
Administration and Management	\$6.16
Engineering and Design	\$5.30
Environmental clearance and permits	\$1.83
Construction	\$62.80
Legal and ROW	\$0.79
Financing	\$5.26
<b>Total</b>	<b>\$82.15</b>

Preliminary Financial Analysis	\$ mil
Project Capital Costs	\$82
DWR Grant Funding	(\$10)
Financed Amount	\$72
Annual Bond Debt Service	\$4.68
Annual O&M	\$1.50
<b>Total Annual Costs (30 years)</b>	<b>\$6.18</b>

Preliminary Unit Cost Analysis	\$	Unit
Flat Tax Cost (264,425 acres)	\$23.39	per Acre
Cost of water (20,000 AFY)	\$309.19	per AF



## 4 Month Look Ahead

1. Perform hydrologic modeling to complete project description and impact analysis for Draft EIR
2. Complete geotechnical investigations
3. Advance preliminary engineering on tunnel and spillway modification
4. Complete San Antonio Dam stability analysis
5. Initiate water rights analysis for revised points of diversion and added storage
6. Complete MOA with CDFW regarding white bass solution



# Next update

- Following completion of modeling and determination of revised operating procedures.
- Communicate modeling results with revised operating plan
- Anticipate October 2018



# Questions