DAM SAFETY PROGRAM

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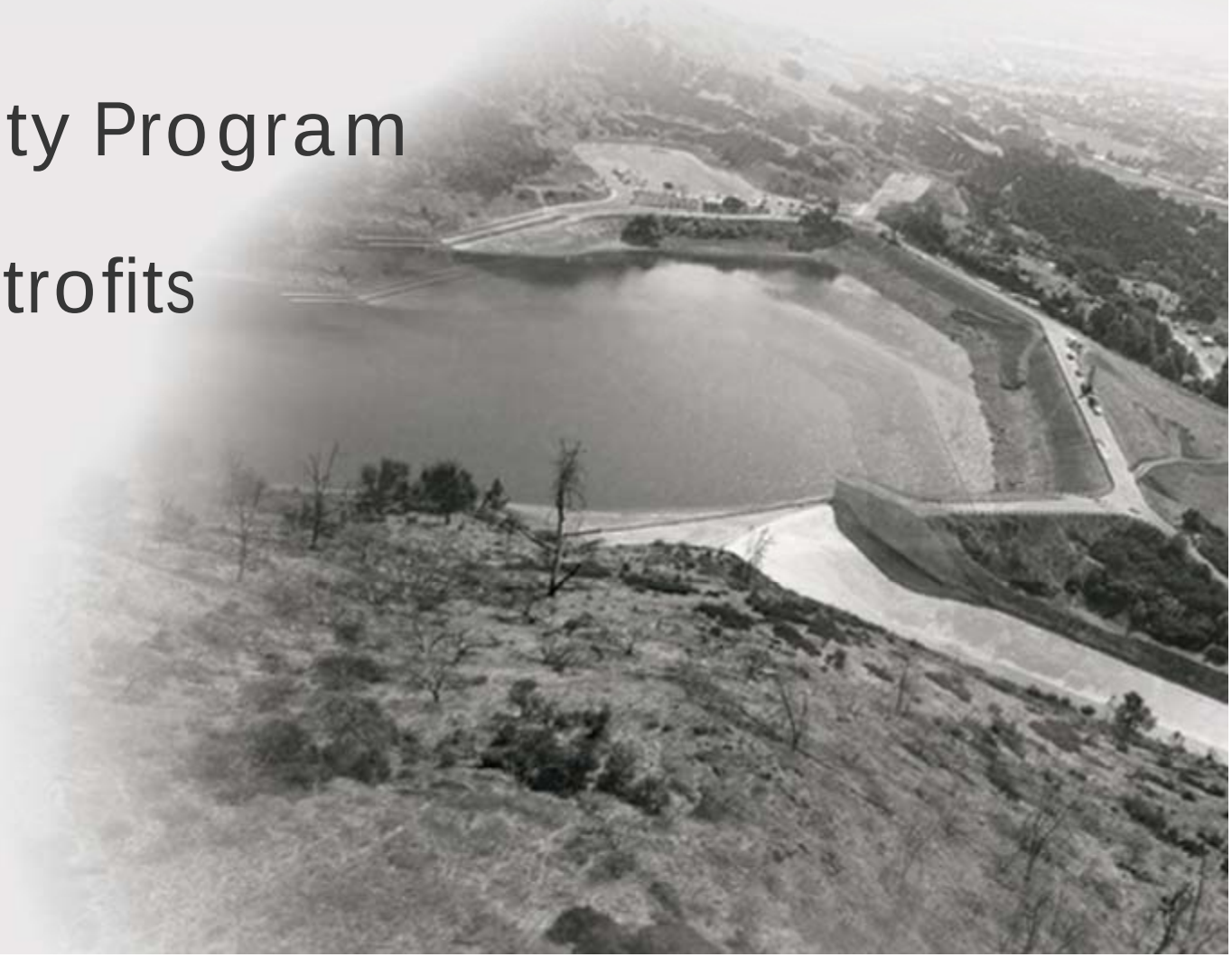
Santa Clara Valley Water District

Presentation Outline

- District dams and reservoirs
- Dam Safety Program
- Seismic retrofits



Reservoirs and Uses

Reservoir	Year Built	Reservoir Capacity	Restricted Capacity	Use	Dam Height
Almaden	1935	1,586 AF	1,472 AF	Recharge & treated	105 ft.
Anderson	1950	90,373 AF	61,810 AF	Recharge & treated	240 ft.
Calero	1935	9,934 AF	4,585 AF	Recharge & treated	98 ft.
Chesbro	1955	7,945 AF	7,945 AF	Recharge	95 ft.
Coyote	1936	23,244 AF	12,382 AF	Recharge & treated	120 ft.
Guadalupe	1935	3,415 AF	2,218 AF	Recharge	129 ft.
Lexington	1952	19,044 AF	19,044 AF	Recharge	195 ft.
Stevens Ck	1935	3,138 AF	3,138 AF	Recharge	120 ft.
Uvas	1957	9,835 AF	9,835 AF	Recharge	118 ft.
Vasona	1935	495 AF	495 AF	Recharge	30 ft.
Total		169.009 AF	122,924 AF		

Board Ends Policies and CEO Strategies

- E-1 – The mission of the District is a healthy, safe, and enhanced quality of living in Santa Clara County…
- S-2.1.2.2 – Manage, operate and maintain dams and reservoir assets to maximize reliability, to minimize life cycle costs and to minimize impacts to the environment.
- S-2.1.2.3 – Aggressively implement dam remediation projects.

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Dam Safety Program Goals

- Public safety
- Water supply
- Flood protection
- Environmental flows
- Dam maintenance

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Dam Safety Program Elements

1. Surveillance & Monitoring
2. Inspections & Maintenance
3. Emergency Preparedness
4. Special Engineering Studies
   - Safety reviews
   - Stability evaluations
   - Condition assessments
   - Spillway capacity analysis
   - Dam instrumentation

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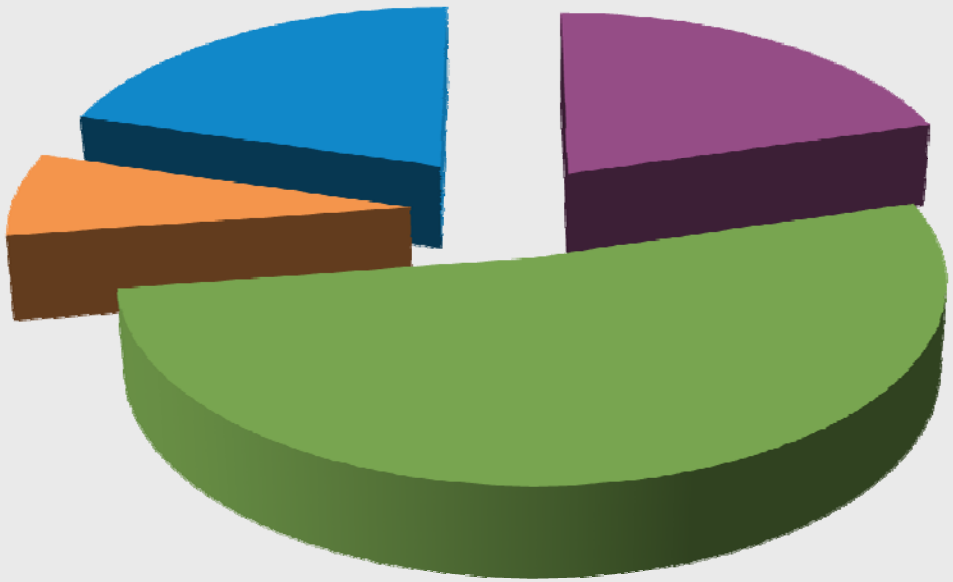
Dam Safety Program FY17 Budget

FY17 Program Budget - $3,230,088



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1. Surveillance and Monitoring

- Water movement through dams
  - o Piezometers
  - o Seepage monitoring weirs
- Physical movements
  - o Survey monuments
  - o Inclinometers

- Automation (ADAS – Automatic Data Acquisition System)
- Annual surveillance report submitted to regulators for each dam

All dams are monitored monthly and show satisfactory behavior

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2. Dam Inspection and Maintenance

- Monthly staff inspections
- DSOD* inspection (all dams)
- FERC* inspection (Anderson)
- Preventive Maintenance :
  - Burrowing animal control
  - Vegetation management
  - Erosion control
  - Weephole cleaning
  - Other activities

Inspection/maintenance of 6 dams completed in FY2016

*DSOD: Division of Safety of Dams

*FERC: Federal Energy Regulatory Commission

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3. Emergency Preparedness and Response

- Annual updated **Emergency Action Plan** for Anderson Dam
- Updated Emergency Action Plans for all dams
- Flood **Inundation Maps** for all dams
- Post **Earthquake Dam Assessment** Program
- Collaboration with downstream agencies on emergency action planning and training exercises

Functional/Desk-top exercises conducted in June 2016.

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4. Special Engineering Studies

- Dam safety reviews
- Seismic stability evaluations
- FERC Safety performance review & Inspections
- Condition assessment of auxiliary facilities
- Spillway capacity analysis
- Dam instrumentation

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Dam Condition Assessments

Reservoir	Embankment	Spillway	Outlet works
Almaden	No retrofit needed	Modify by 2024	Replace by 2024
Anderson	Retrofit by 2021	Modify by 2021	Replace by 2021
Calero	Retrofit by 2020	Modify by 2020	Replace by 2020
Chesbro	Evaluation completion by 2020	Evaluation completion by 2020	Evaluation completion by 2020
Coyote	Evaluation completion by 2020	Evaluation completion by 2020	No modification – replaced in 1992
Guadalupe	To be retrofitted by 2022	To be modified by 2022	To be replaced by 2022
Lexington	No retrofit needed	Spillway study to be initiated in 2020	No modification – replaced in 2011
Stevens Ck	No retrofit needed	Spillway study to be initiated in 2020	No modification – replaced in 1985
Uvas	Evaluation completion by 2020	Evaluation completion by 2020	Evaluation completion by 2020
Vasona	Safety study to be initiated in 2020	Spillway study to be initiated in 2020	N/A

Seismic Stability Evaluations

- Completed seismic stability evaluations for 6 out of 9 dams
- Almaden, Lenihan and Stevens Creek Dams do not need remediation.
- Anderson, Calero and Guadalupe Dams showed seismic deficiencies.
- Safety evaluations of Chesbro, Uvas and Coyote Dams initiated in FY15.
- Coyote Dam included in the study because it crosses Calaveras Fault and storage has been restricted since 1992.

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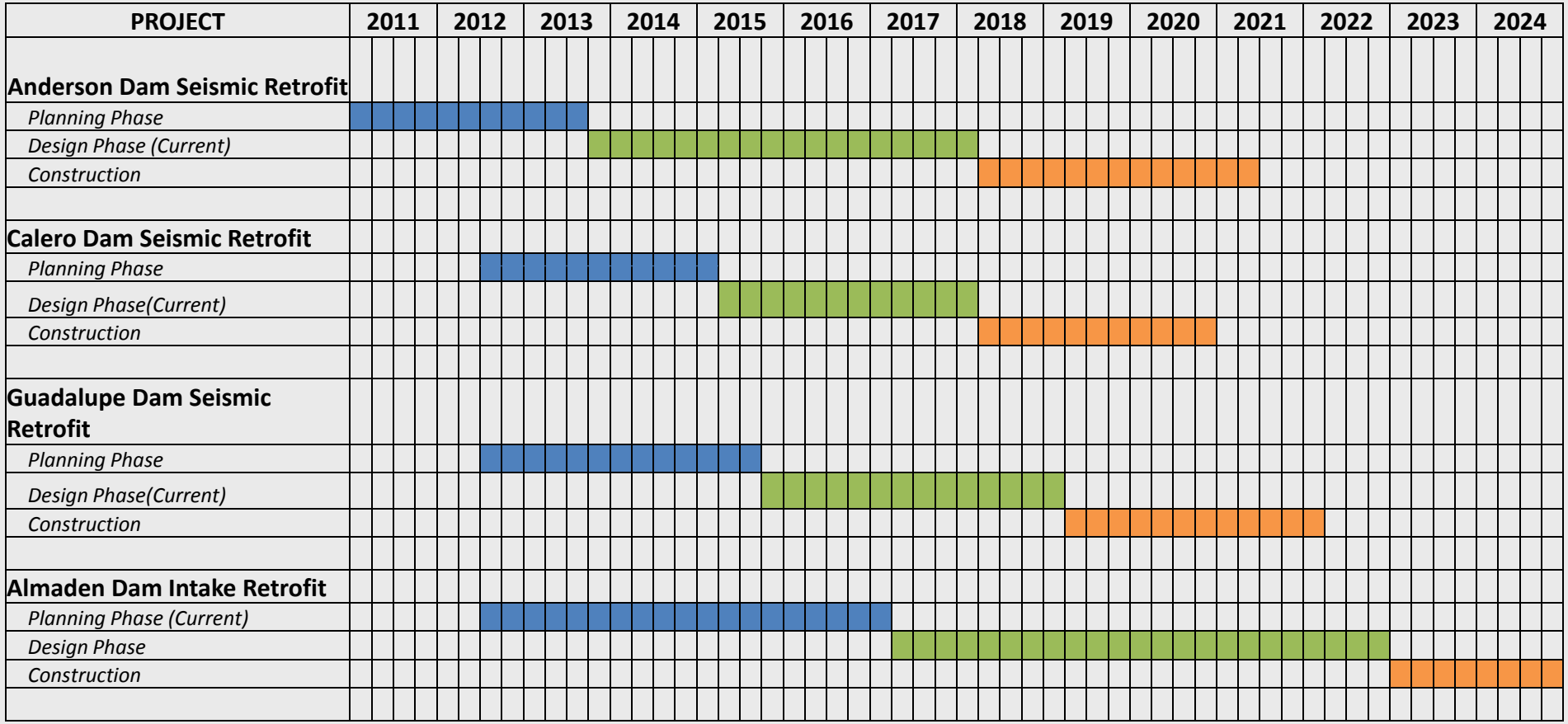
Seismic Retrofit Projects



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Costs – Seismic Retrofit Projects

Project	Project No.	FY 2017-21 CIP (in $ millions)
Anderson Dam Seismic Retrofit Project	91864005	$ 201
Calero-Guadalupe Seismic Retrofit Project	91084020	$ 154
Almaden Dam Improvements Project	91854001	$ 57
	Total	**$ 412**

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