

Anderson Dam Seismic Retrofit Project Project No. 91864005

Engineer's Report



January 2025

Dam Safety & Capital Delivery Division



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ANDERSON DAM SEISMIC RETROFIT PROJECT PROJECT NO. 91864005

ENGINEER'S REPORT

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JANUARY 2025

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1. PROJECT DESCRIPTION

Anderson Dam is located along Coyote Creek in Santa Clara County, California. Anderson Dam is located 2.5 miles northeast of downtown Morgan Hill and 18 miles southeast of downtown San Jose. A location map is shown in Figure 1. Anderson Dam is under the jurisdiction of the Federal Energy Regulatory Commission (FERC) and the California Department of Water Resources, Division of Safety of Dams (DSOD). DSOD has classified the downstream hazard potential for Anderson Dam as “Extremely High”.

Anderson Dam impounds Anderson Reservoir. Anderson Reservoir is Valley Water’s largest reservoir and provides a reliable supply of water to Santa Clara County. Anderson Reservoir has over 89,000 acre-feet of storage capacity, which is more storage than Valley Water’s remaining nine reservoirs combined. Anderson Reservoir is used to capture stormwater runoff that would otherwise flow into the San Francisco Bay. Releases from Anderson Reservoir are used to supply groundwater recharge facilities, supply treatment plants for potable water, and provide environmental flows for downstream habitat along Coyote Creek. Anderson Reservoir also provides storage for imported water, incidental flood protection for the downstream population along Coyote Creek, and recreational opportunities.

The Anderson Dam Seismic Retrofit Project (ADSRP, Project) will address dam safety concerns related to the performance of Anderson Dam. Anderson Reservoir has been operated under restriction since December 2008. On February 20, 2020, FERC directed Valley Water to maintain Anderson Reservoir at dead pool (elevation 490’). Upon completion of ADSRP, Anderson Reservoir will return to its original storage capacity.

The ADSRP will remove and replace most of the existing embankment dam, and construct a new low-level outlet, a new high-level outlet, and a new spillway along the right abutment. Key Project features are shown in Figure 4. The Project will require seven years to construct, which is driven by the need to construct the new embankment dam in five years and two additional years for landscape establishment. During the five years of embankment dam reconstruction, as the existing embankment dam is excavated and the new embankment dam is constructed, the existing spillway will not be available to safely pass large storms. The reconstruction sequence includes having a smaller, interim embankment dam in place each winter with a reduced reservoir capacity, which increases the likelihood of overtopping and risk to the downstream population. Prior to each winter, embankment dam construction is stopped in order to construct a temporary spillway on each interim dam to help safely pass additional flows and reduce the risk to the downstream population to the extent practicable. The construction schedule is shown on Figure 6, and the various interim dams are shown on Figure 5.

1.1. Background

1.1.1. Existing Anderson Dam

Construction of Anderson Dam was originally completed in 1950. Anderson Dam originally comprised an embankment dam, an outlet pipe, and a spillway. The original embankment dam was raised in 1987, the original spillway was widened in 1988, the original inlet structure for the outlet pipe was replaced in 1989, and a hydroelectric facility was constructed in 1986.

A summary of project features for the existing Anderson Dam and Anderson Dam post-ADSRP are provided in Table 1.

1.1.2. Project Initiation

The ADSRP was initiated based on preliminary findings from a seismic stability evaluation. The seismic stability evaluation was completed in 2011 and found material susceptible to liquefaction at the base (lower fine fill) and in the foundation (alluvium) of the embankment

dam. Results from the post-earthquake stability analyses suggest the downstream slope would become unstable and the upstream slope may undergo 11 to 25 feet of permanent deformation following the maximum credible earthquakes. Results from the fault hazard evaluation determined the existing outlet pipe would not accommodate the estimates of fault displacement at Anderson Dam.

The Board approved a budget adjustment on January 25, 2011, to fund staff labor to begin work on the ADSRP, and the Project was subsequently added to the Fiscal Year 2012-2016 Capital Improvement Program (CIP).

1.1.3. Project Planning

Planning commenced in 2012 and completed in 2013. The objectives for the ADSRP as outlined in the Planning Study Report were to make improvements necessary to:

- Stabilize the dam embankment for the maximum credible earthquakes on the Calaveras and Coyote Creek Faults,
- Modify or replace the outlet works to protect against potential fault rupture risk from the maximum credible earthquake on the Coyote Creek-Range Front fault zone, and
- Incorporate other measures to address safety deficiencies, including potential spillway modifications that are determined to be necessary.

In addition to the above objectives, the Project, where possible, should:

- Minimize short-term and long-term impacts to the environment, reservoir and water operations, and recreational use of the reservoir, and
- Provide for inspection and maintenance of the embankment, outlet works, and spillway, without significantly affecting dam and reservoir operations.

During planning, it was found that the existing outlet pipe would not meet DSOD requirements for emergency drawdown of the reservoir, and that the existing spillway would not safely pass the probable maximum flood.

Nineteen preconceptual alternatives were developed and screened. Of these nineteen preconceptual alternatives, thirteen became conceptual alternatives and scored. The six highest scoring conceptual alternatives became feasible alternatives and ranked. The highest ranked feasible alternative became the staff recommended alternative. The staff recommended alternative as outlined in the Planning Study Report include:

- Upstream and downstream embankment excavation and buttresses to improve seismic stability,
- A new low-level outlet carrier pipe in an oversized tunnel to accommodate fault rupture,
- A high-level outlet tunnel that will discharge in the spillway to provide the ability to draw down the reservoir quickly,
- Raised spillway walls and dam crest to safely pass the Probable Maximum Flood (PMF), and
- Construction of the Project with a fully drained reservoir during the second of the planned three-year construction period.

A conceptual plan and conceptual cross-section of the staff recommended alternative as outlined in the Planning Study Report is shown in Figure 7 and Figure 8, respectively. The Planning Study Report was provided to the Board in a Non-Agenda Memo dated August 29, 2013.

1.1.4. Project Design

Design commenced in 2013. During design, various findings, comments by the FERC, DSOD, and an independent Board of Consultants, and directions from FERC necessitated modifications to the staff recommended alternative as outlined in the Planning Study Report. Key modifications during design are summarized in the Table 2.

The general project performance requirements for the ADSRP as outlined in the Design Criteria Memorandum include:

- All permanent project facilities – including the embankment, outlet works, spillway, and their appurtenances – will have a useful life of at least 50 years without requiring major repairs.
- The embankment and outlet works will be operable following the maximum credible earthquake or probable maximum flood.
- The spillway will be able to safely pass the probable maximum flood past the outlet facilities downstream of the dam with exceptions following the maximum credible earthquake.

The ADSRP will remove and replace most of the existing dam with a well-compacted, zoned embankment dam. A small portion of the existing dam core (core remnant) will remain. The new embankment dam will include a well-compacted central core flanked by a chimney filter and transition zone on the upstream side, and flanked by a chimney filter, chimney drain, and transition zone on the downstream side; and supported by well-compacted granular shell on the upstream and downstream sides. A blanket filter, blanket drain, and transition zone will underlie the downstream shell; the blanket drain will convey seepage water to a seepage measurement weir at the downstream toe of the dam.

The ADSRP will construct a new low-level outlet and a new high-level out to meet DSOD requirements for emergency drawdown of the reservoir. The new low-level outlet comprises a multi-port intake structure, a pipeline in a tunnel, and an outlet structure. A separate dedicated pipeline will be provided to maintain environmental releases to Coyote Creek. The new low-level outlet structure will allow simultaneous releases to Coyote Creek, Anderson Force Main, and Main Avenue Pipeline; or simultaneous releases to Coyote Creek and imports from the U.S. Bureau of Reclamation's San Felipe Division of the Central Valley Project pumped into Anderson Reservoir through the Anderson Force Main. The new-high-level outlet comprises an intake structure, a tunnel with a bulkhead gate inside a gate shaft, and an outlet structure. The new high-level outlet provides capacity to meet DSOD requirements for emergency drawdown of the reservoir.

The ADSRP will remove and replace the existing concrete spillway. The new spillway will be designed to safely pass the probable maximum flood. The new spillway will span the length of the existing spillway and extend to the end of the existing unlined channel.

Project features are shown on Figure 4 and listed in Table 1. The construction schedule is shown on Figure 6.

1.1.5. Anderson Reservoir Restriction

Valley Water has operated Anderson Reservoir with restriction since December 2008. On February 20, 2020, FERC directed Valley Water to immediately maintain Anderson Reservoir below elevation 565 feet, to begin to further lower Anderson Reservoir to dead pool no later than October 1, 2020, and to maintain Anderson Reservoir at dead pool thereafter. Table 3 provides a summary of restrictions imposed on Anderson Reservoir since December 2008.

1.2. Mitigation and Conservation Measures

The ADSRP includes mitigation and conservation measures (CMs) required to construct and operate the ADSRP. The proposed mitigation measures and CMs are described in detail in the ADSRP Environmental Impact Report. Among the CMs are the following:

1.2.1. The Ogier Ponds CM

The Ogier Ponds CM would separate Coyote Creek from Ogier Ponds and consist of significant earthwork to reconstruct the pre-1997 creek channel adjacent to the ponds to create a geomorphically stable creek, adding habitat and biological features to the creek and surrounding floodplain. This conservation measure would provide ecological enhancements to the channel and floodplain, improve water temperature impacts of the ponds, enhance fish migration, reduce fish entrainment, and integrate public access. A location map is shown on Figure 2.

1.2.2. The Phase 2 Coyote Percolation Dam Fish Passage Enhancements CM

The Phase 2 Coyote Percolation Dam Fish Passage Enhancements CM would include the construction of a roughened channel fishway below and up to the bladder dam to allow for improved fish passage over the deflated bladder dam over a range of flow conditions. This CM will include necessary earthwork alterations to provide adequate flow depths and velocities across the concrete foundation and deflated bladder dam. A location map is shown on Figure 3.

2. ZONE BENEFITS

The ADSRP benefits customers in North County (Zone W-2) and South County (Zones W-5 and Zone W-7). Anderson reservoir is Valley Water's largest surface water reservoir, stores local and imported water, and provides direct and/or groundwater benefits to customers of Zones W-2, W-5, and W-7.

3. PROJECT RIGHT OF WAY

3.1. ADSRP

The ADSRP improvements will primarily be constructed on Valley Water property. The Project will require rights of way and real estate agreements from both private and public entities to access or construct some portions of the Project. Parcels that will be impacted by the Project are shown on Figure 9. ADSRP affected parcels are listed in Table 4 along with the Project use and real estate need.

3.2. Ogier Ponds CM

The Ogier Ponds CM will primarily be constructed on Santa Clara County property. The CM will require rights of way and real estate agreements from both private and public entities to access, construct, and maintain the CM. Parcels that will be impacted by the CM are shown on Figure 10 and the affected parcels are described in Table 5.

3.3. Phase 2 Coyote Percolation Dam CM

The Phase 2 Coyote Percolation Dam will primarily be constructed on Valley Water property. The CM will require real estate agreements with public entities to access the site and stage materials and equipment. Parcels that will be impacted by the CM are shown on Figure 11 and the affected parcels are described in Table 6.

4. PROJECT COSTS

4.1. ADSRP

The estimated total project cost to plan, design, permit, and construct the Project, based on design documents, 90% design Engineer's Opinion of Probable Costs, and previous years expenditures, is approximately \$1,899,155,000 (with inflation). The Project is included in the Capital Improvements Program (CIP) FY2025-29 Five-Year Plan and in the FY 2024-25 Adopted Budget. The estimated costs (excluding inflation) to complete the Project are shown below.

- a. Planning Phase: \$16.4 million
- b. Permits: \$98.1 million
- c. Design Phase: \$150.4 million
- d. Rights-of Way: \$36.1 million
- e. Construct: \$1.5 billion
- f. Closeout: \$1.1 million

The above estimated costs include the construction or implementation costs for all the CMs and mitigation measures for ADSRP, except for the Ogier Ponds CM and the Phase 2 Coyote Percolation Dam CM. The costs of implementing these two CMs are separately provided in the later sections.

The Project is forecasted to receive up to \$54.1 million from the renewed Safe, Clean Water & Natural Flood Protection Program (Fund 26), with the remainder of the total ADSRP Project costs funded by the Water Utility Fund (Fund 61) with 81.4% of the costs allocated to North County Zone W-2, 7.9% to South County Zone W-5 and 10.8% to South County Zone W-7.

A portion of the ADSRP costs is expected to be financed by the Water Infrastructure Finance and Innovation Act (WIFIA) pursuant to the United States Environmental Protection Agency WIFIA Master Agreement with Valley Water dated February 14, 2023.

4.2. Ogier Ponds CM

The estimated total project cost to plan, design, and construct the Ogier Ponds CM, based on Engineer's Opinion of Probable Costs, and previous years expenditures, is approximately \$69,680,000 (with inflation). The ADSRP project plan includes an additional \$50 million for Ogier Ponds which when combined with the planned expenditures totals \$119,680,000. The CM is included in the Capital Improvements Program (CIP) FY2025-29 Five-Year Plan and in the FY 2024-25 Adopted Budget. The estimated costs (excluding inflation) to complete the CM are shown below.

- a. Planning Phase: \$3.8 million
- b. Design Phase: \$2.2 million
- c. Construct: \$42.7 million

The CM is forecasted to receive up to \$13.8 million from the renewed Safe, Clean Water & Natural Flood Protection Program (Fund 26), \$28.0 million from the Watershed Stream Stewardship Fund (Fund 12) with the remainder of the total CM costs funded by the Water Utility Fund (Fund 61) with 81.4% of the costs allocated to North County Zone W-2, 7.9% to South County Zone W-5 and 10.8% to South County Zone W-7.

4.3. Phase 2 Coyote Percolation Dam CM

The estimated total project cost to design and construct the Phase 2 Coyote Percolation Dam CM, based on Engineering Costs Estimates is approximately \$19,960,000 (with inflation). The CM is included in the Capital Improvements Program (CIP) FY2025-29 Five-Year Plan. The estimated costs (excluding inflation) to complete the CM are shown below.

- a. Design Phase: \$0.9 million
- b. Construct: \$14.2 million

The CM is funded entirely by the Water Utility Fund (Fund 61) with 81.4% of the costs allocated to North County Zone W-2, 7.9% to South County Zone W-5 and 10.8% to South County Zone W-7.

5. PROJECT SCHEDULES

A summary of Project and CM phases and milestones are provided below.

Project Phase	Start	End
ADSRP		
Planning	January 2011	August 2013
Environmental	January 2013	December 2033
Design	September 2013	March 2026
Rights-of Way	September 2013	March 2026
Procurement	January 2024	June 2025
Advertise for Construction*	June 2025	
Award Construction Contract*	May 2026	
Construction	June 2026	December 2033
Ogier Ponds CM		
Planning	March 2019	June 2026
Design	August 2025	June 2031
Construction	June 2031	June 2033
Phase 2 Coyote Percolation Dam CM		
Design	July 2026	June 2027
Construction	June 2027	June 2031

*Indicates Milestones

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- Figure 2. Ogier Ponds CM Location Map
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- Figure 8. Conceptual Cross-Section of the Staff Recommended Alternative as Outlined in the Planning Study Report
- Figure 9. Anderson Dam Seismic Retrofit Project Affected Parcels
- Figure 10. Ogier Ponds CM Affected Parcels
- Figure 11. Phase 2 Coyote Percolation Dam Affected Parcels

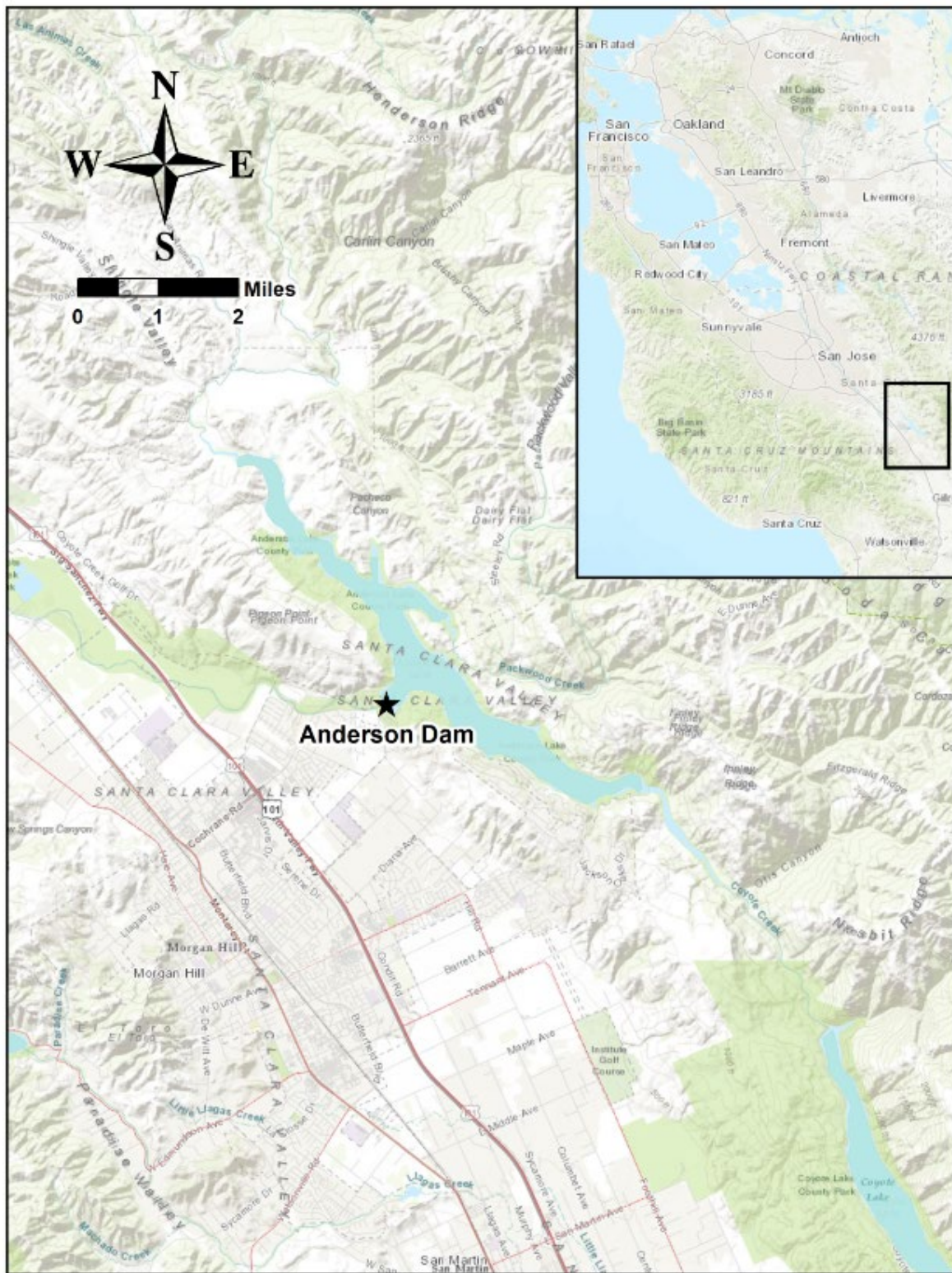


Figure 1. ADSRP Location Map

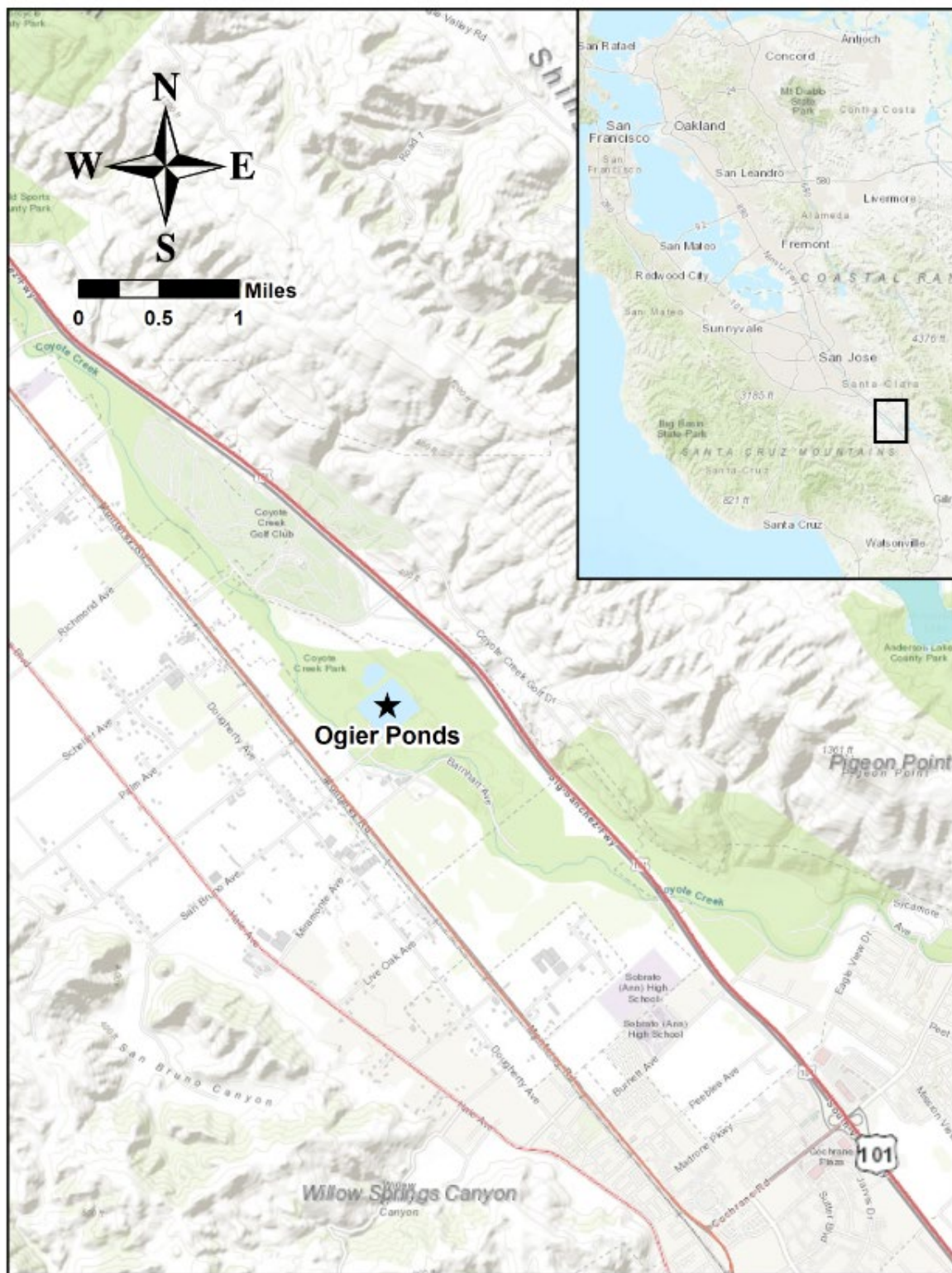


Figure 2. Ogier Ponds CM Location Map

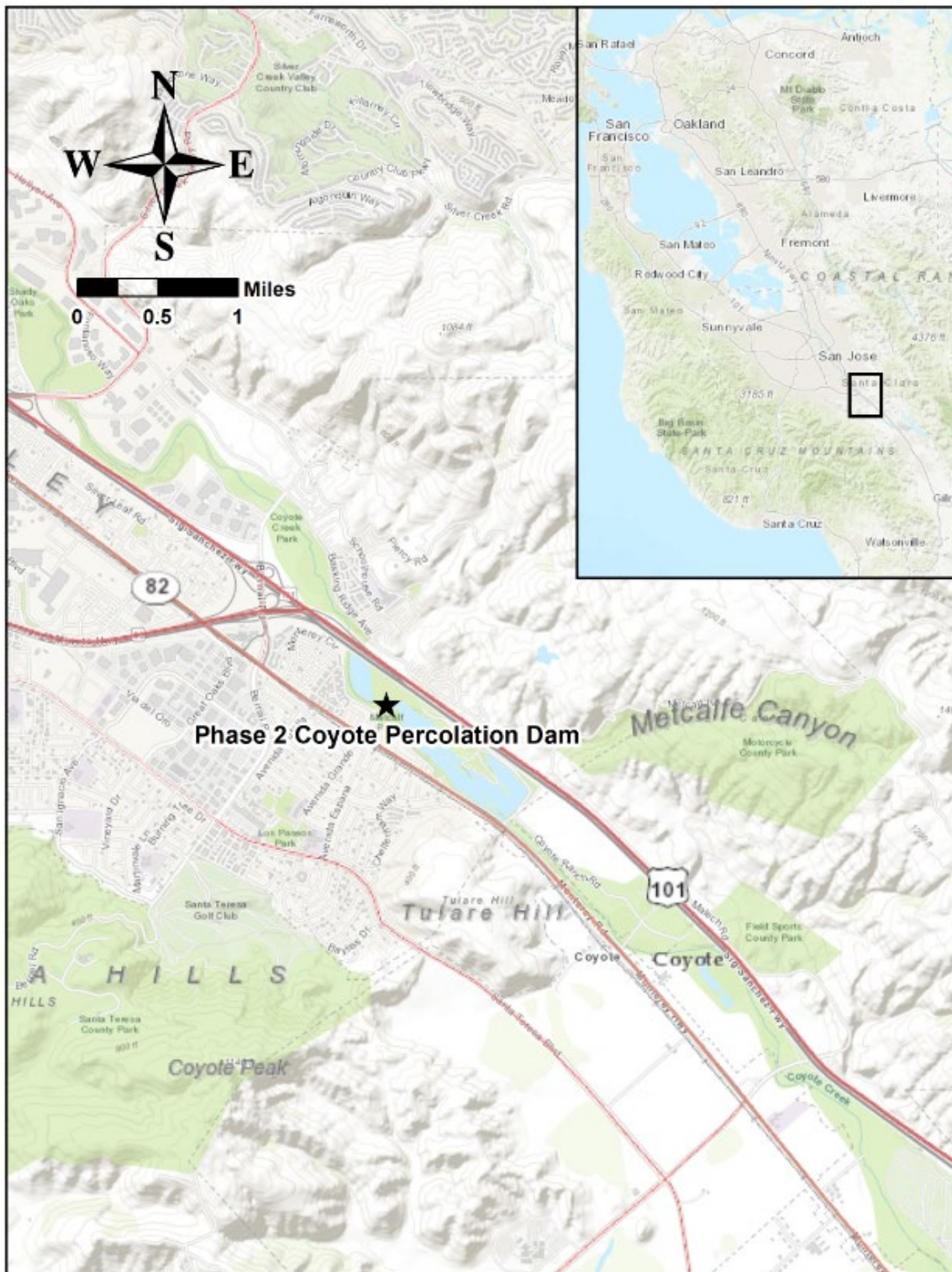


Figure 3. Phase 2 Coyote Percolation Dam CM Location Map



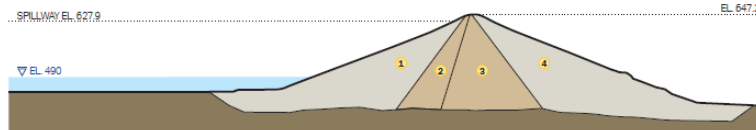
Figure 4. Features Map

Construction Season - Year 1 - Existing Dam

Summer Control of Water:
 - Stage 1 diversion completed (ADTP); water level lowered to 490'
 - Water level partial draw down to 465' and then 450'

Construction:
 - Site preparation (haul roads, stockpile areas, dredging, Stage 2 Diversion construction)

Winter Control of Water:
 - Existing Outlet Works and Stage 1 Diversion
 - Water raised to 490'



Construction Season - Year 2 - Stage 1A Interim Dam

Summer Control of Water:
 - Bypass pumping

Construction:
 - Cofferdam construction
 - Stage 2 Diversion construction
 - Stage 1A interim dam excavation

Winter Control of Water:
 - Stage 2 Diversion

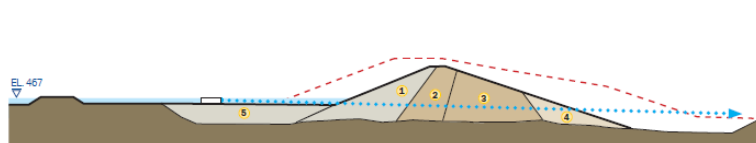


Construction Season - Year 3 - Stage 1B Interim Dam

Summer Control of Water:
 - Stage 2 Diversion

Construction:
 - Stage 1B interim dam excavation

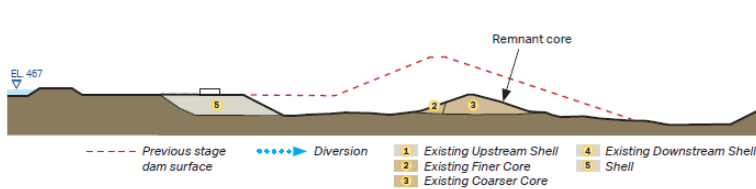
Winter Control of Water:
 - Stage 2 Diversion



Construction Season - Year 4 - Stage 2A Interim Dam

Summer Control of Water:
 - Stage 2 Diversion

Construction:
 - Stage 2A interim dam excavation

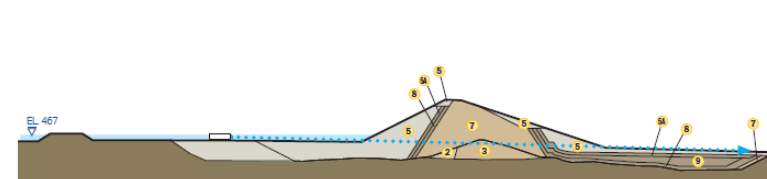


Construction Season - Year 4 - Stage 2B Interim Dam

Summer Control of Water:
 - Stage 2 Diversion

Construction:
 - Stage 2B embankment fill

Winter Control of Water:
 - Stage 2 Diversion

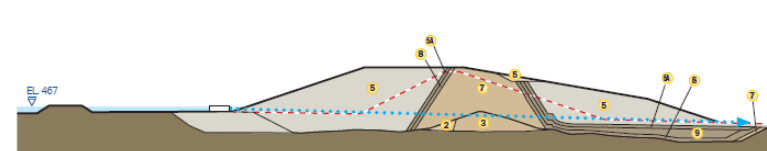


Construction Season - Year 5 - Stage 3A Interim Dam

Summer Control of Water:
 - Stage 2 Diversion

Construction:
 - Stage 3A embankment fill

Winter Control of Water:
 - Stage 2 Diversion



Construction Season - Year 6 - Stage 3B Interim Dam

Summer Control of Water:
 - Bypass pumping

Construction:
 - Stage 3B embankment fill
 - Complete low-level Outlet Works

Winter Control of Water:
 - Completed Outlet Works



Construction Season - Year 7 and Beyond - Replacement Dam

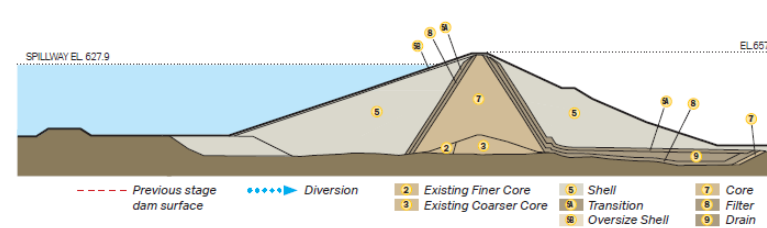


Figure 5. Interim Dams

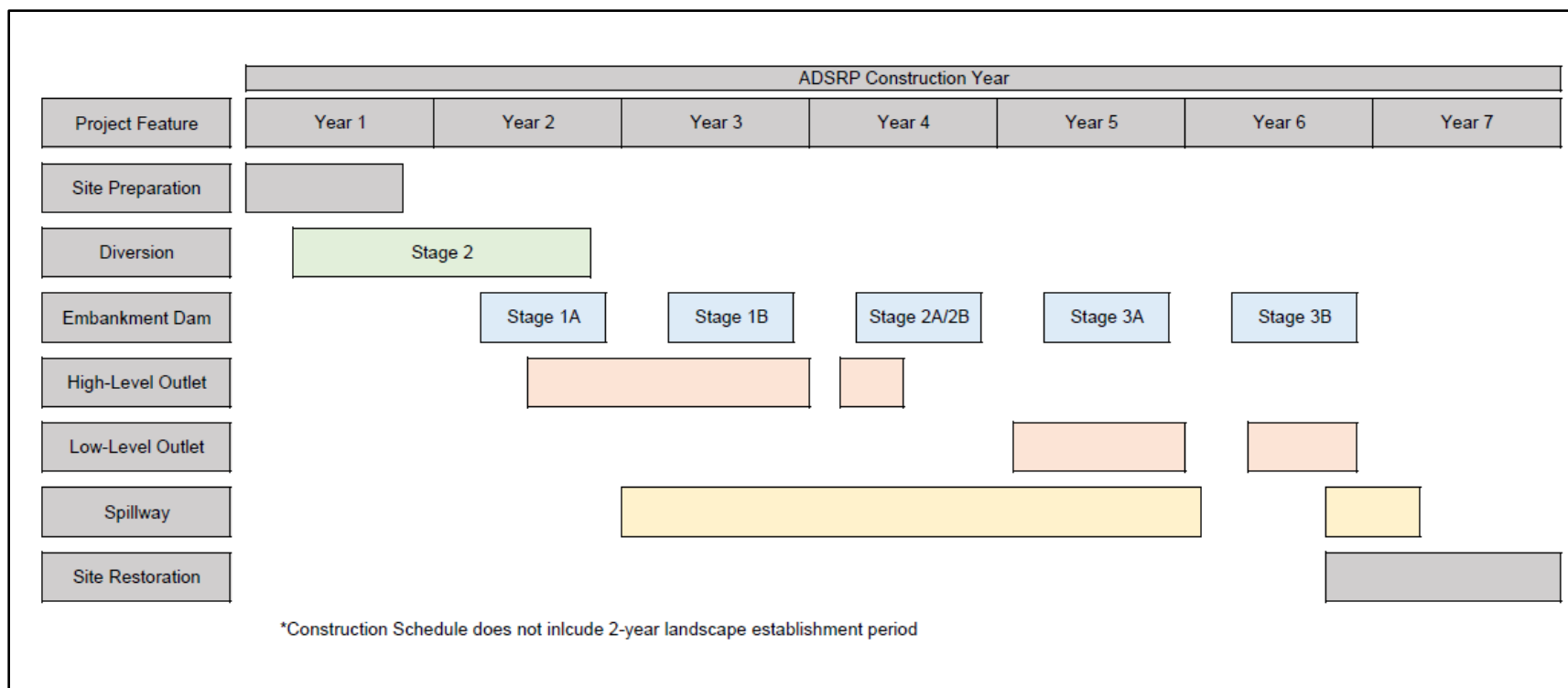


Figure 6. Construction Schedule¹

¹ Construction Schedule does not include the 2-year landscape establishment period

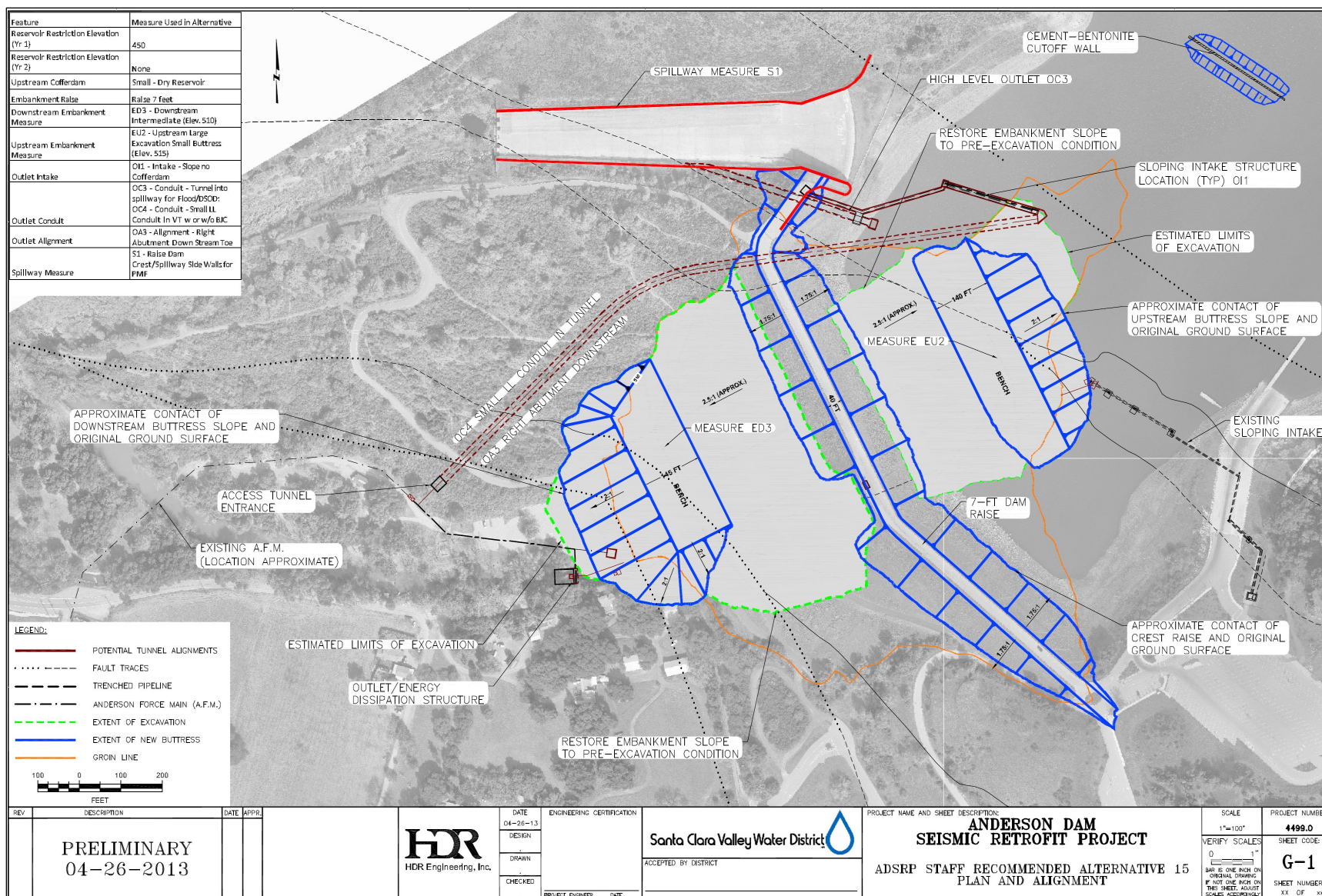


Figure 7. Conceptual Plan of the Staff Recommended Alternative as Outlined in the Planning Study Report

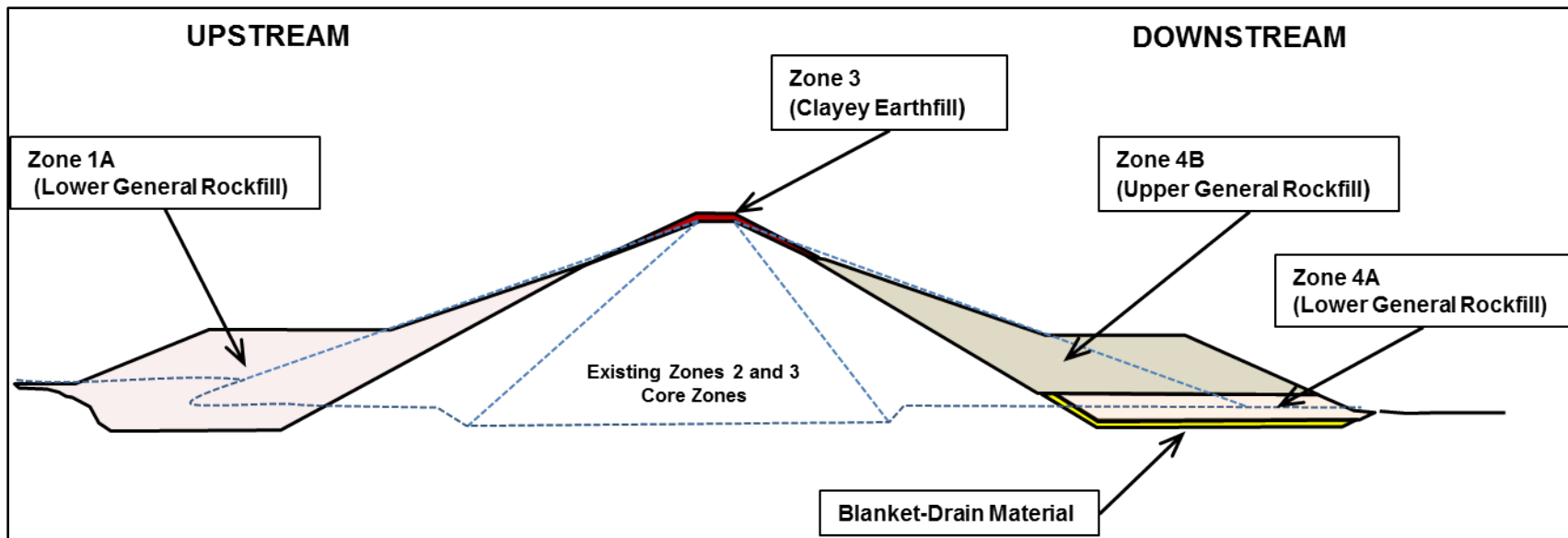


Figure 8. Conceptual Cross-Section of the Staff Recommended Alternative as Outlined in the Planning Study Report

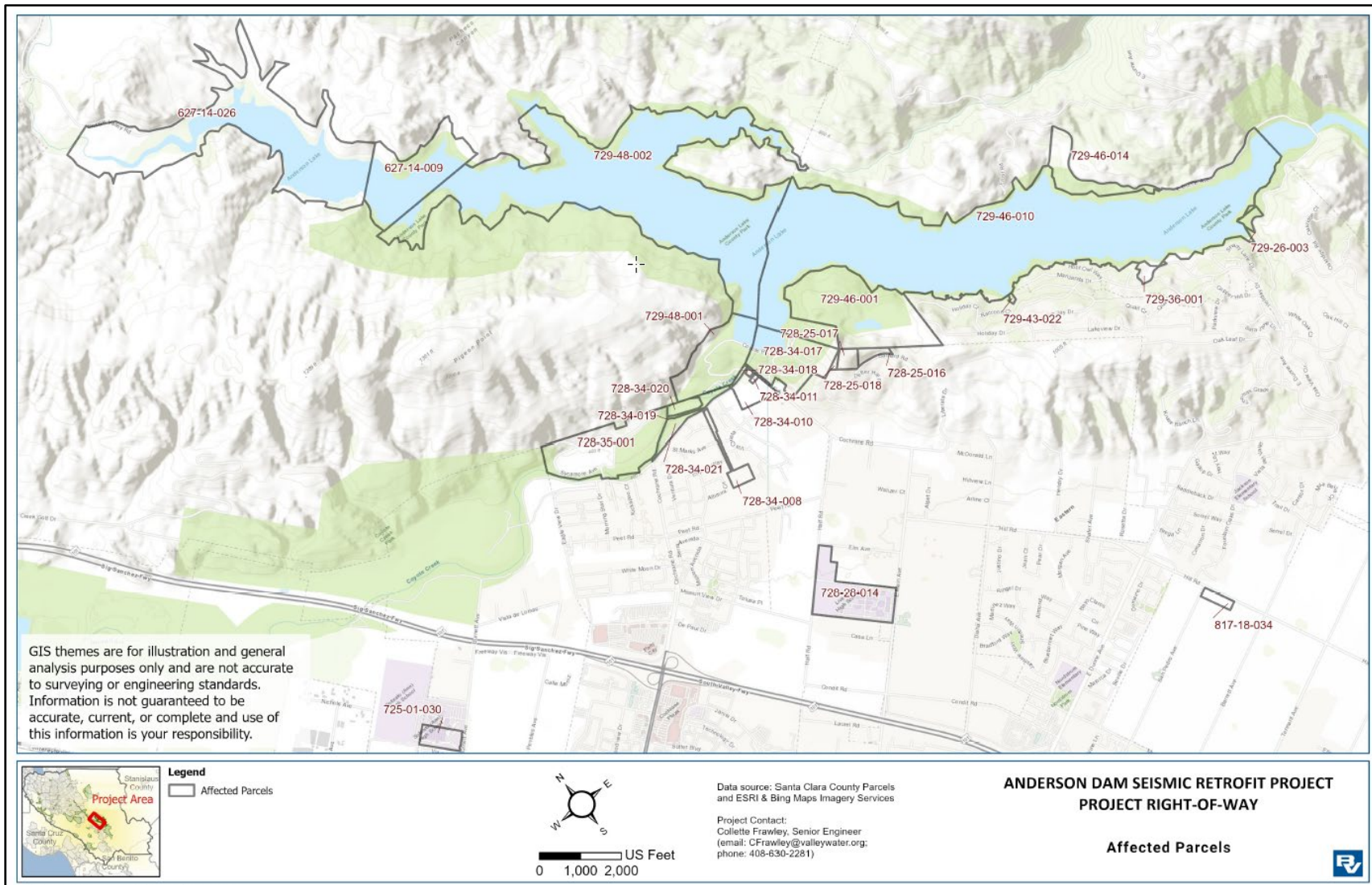


Figure 9. Anderson Dam Seismic Retrofit Project Affected Parcels

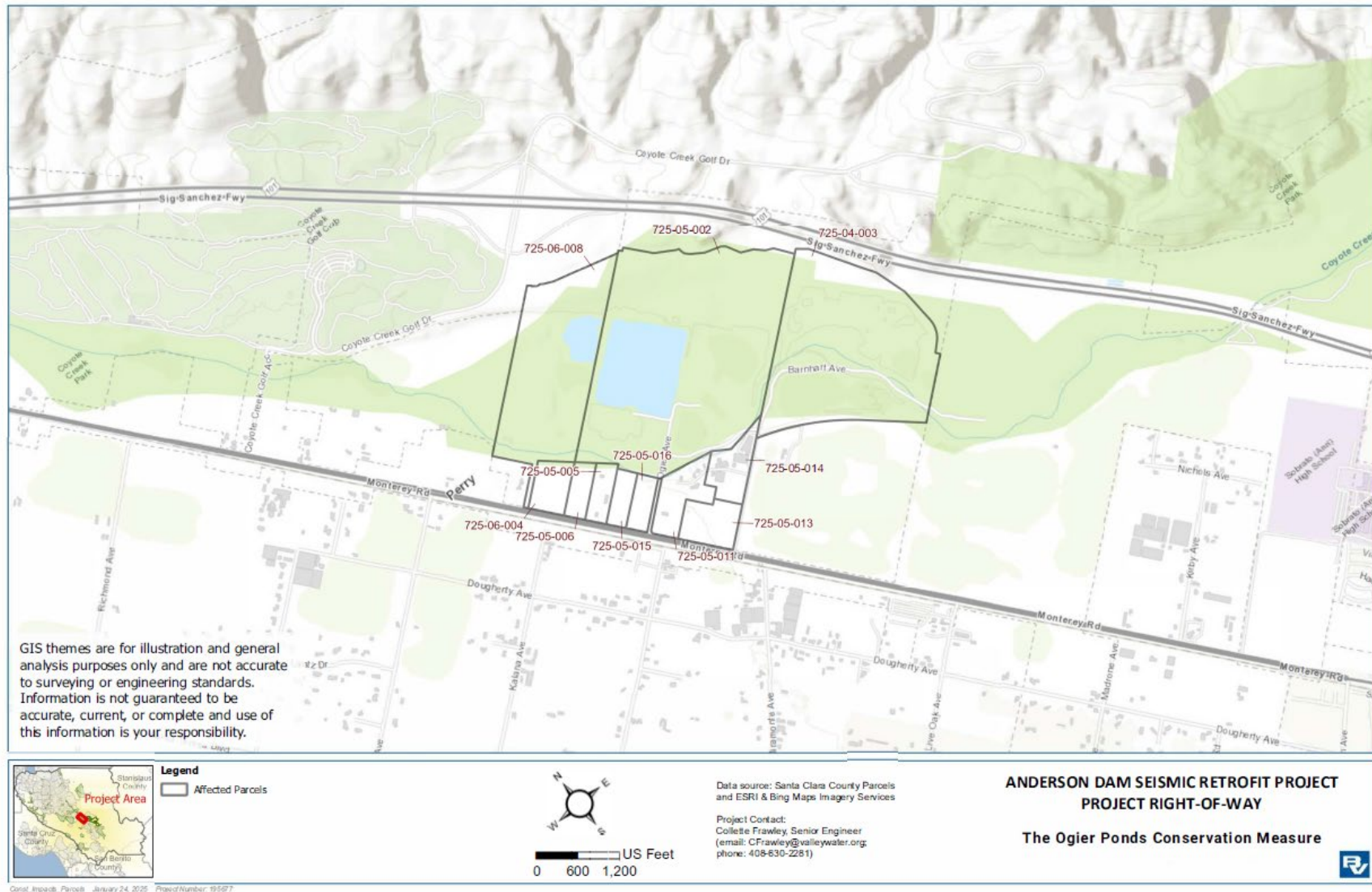


Figure 10. Ogier Ponds CM Affected Parcels

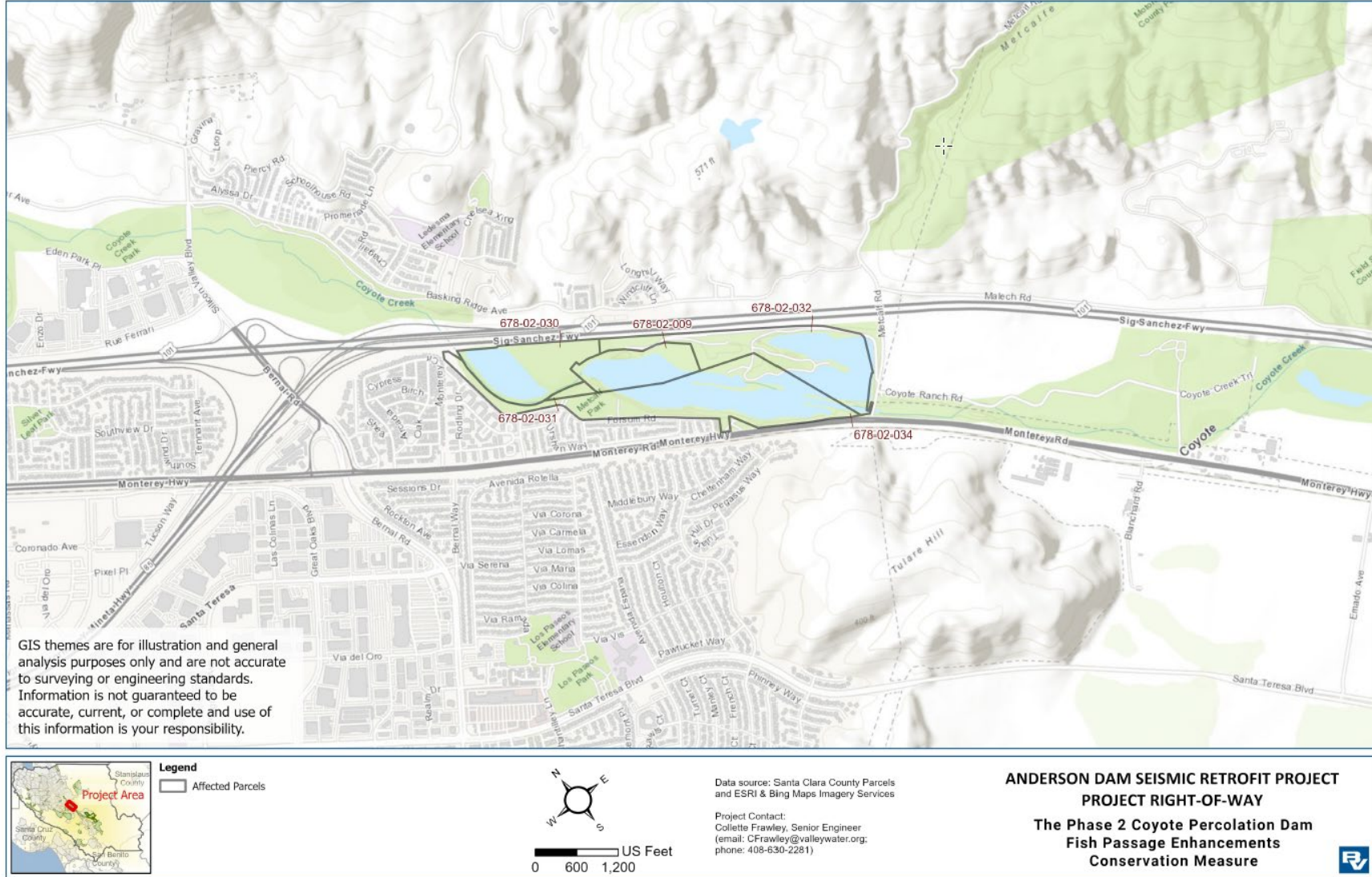


Figure 11. Phase 2 Coyote Percolation Dam Affected Parcels

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Table 1. Project Features

Table 2. Key Modifications During Design

Table 3. Reservoir Restrictions

Table 4. ADSRP Affected Parcels

Table 5. Ogier Ponds Affected Parcels

Table 6. Phase 2 Coyote Percolation Dam Affected Parcels

Table 1. Project Features

	Existing	Post-ADSRP
Embankment Dam		
Crest Elevation	647.2 feet	656.0 feet plus 4 feet of camber
Crest Length	1,400 feet	1,680 feet
Crest Width	25 to 43 feet	40 feet
Slope	2.5H:1V	Upstream: 3H:1V Downstream: 1.9H:1V to 2.2H:1V
Maximum Height	240 feet	249 feet
Outlet Works		
Low-Level Outlet Location	Left Abutment	Right Abutment
Low-Level Outlet Capacity	500 cfs	1,485 cfs ²
Low-Level Outlet Intake Elevation	490, 528, and 563 feet	488, 528, and 563 feet
High-Level Outlet Location	-	Right Abutment
High-Level Outlet Capacity	-	5,300 cfs
High-Level Outlet Intake Elevation	-	528 feet
Spillway		
Spillway Location	Right Abutment	Right Abutment
Spillway Crest Elevation	627.9 feet	627.9 feet
Spillway Capacity	65,500 cfs	95,800 cfs
Spillway Length	845 feet	1,645 feet

² Includes releases from both the primary outlet pipe and the bypass outlet pipe

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Table 2. Key Modifications During Design

Timeline	Impetus for Modification	Modification to the Staff Recommended Alternative
c. 2016	<p>New potential failure modes initiated by fault displacement below the embankment dam were postulated during design, which were not considered during planning. Further, it was concluded that the existing downstream transition zone cannot be relied upon to function as a filter between the central core and downstream shell.</p> <p>Separately, the existing upstream shell was concluded to be susceptible to liquefaction.</p>	Five new alternatives were considered for the new embankment dam. In lieu of constructing upstream and downstream buttresses as shown in Figure 6, most of the existing embankment dam will be removed and replaced with a well-compacted, zoned embankment dam. A small portion of the existing dam core (core remnant) will remain. The new embankment dam will include a well-compacted central core flanked by a chimney filter and transition zone on the upstream side, and flanked by a chimney filter, chimney drain, and transition zone on the downstream side; and supported by well-compacted granular shell on the upstream and downstream sides. A blanket filter, blanket drain, and transition zone will underlie the downstream shell; the blanket drain will convey seepage water to a seepage measurement weir at the downstream toe of the dam.
c. 2017	Following a major spillway incident at Oroville Dam in February 2017, FERC and DSOD required a comprehensive condition assessment of the existing spillway. Based on findings from the condition assessment and new potential failure modes postulated for the existing spillway, alternatives to replace the existing spillway were considered.	Seven new alternatives were considered for the new spillway. The extent the existing spillway will be replaced was further expanded to address comments from the independent Board of Consultants. In lieu of raising the existing spillway walls, most of the existing spillway will be removed and replaced.
c. 2017	A value engineering proposal was adopted to revise the configuration the high-level outlet to incorporate the diversion outlet structure.	In lieu making releases from the new high-level outlet into the new spillway, releases from the new high-level outlet will be made from the diversion outlet structure into Coyote Creek.
c. 2020	<p>On February 20, 2020, FERC directed Valley Water to:</p> <ul style="list-style-type: none"> ▪ Immediately maintain Anderson Reservoir below elevation 565 feet ▪ Begin to further lower Anderson Reservoir to dead pool (elevation 490 feet) no later than October 1, 2020, and maintain Anderson Reservoir at dead pool (elevation 490 feet) thereafter ▪ Design and construct a new low-level outlet as soon as possible (Anderson Dam Tunnel Project) 	In lieu of constructing all project features under one construction contract, the Anderson Dam Tunnel Project will construct a new low-level outlet, which will be used as a water diversion during ADSRP construction.

Timeline	Impetus for Modification	Modification to the Staff Recommended Alternative
c. 2022	On December 17, 2021, the independent Board of Consultants noted that measures to winterize the interims dams could include measures to armor the interim dams to safely convey overtopping flows without breaching the interim dams.	In lieu of minimal winterization measures, a temporary spillway will be constructed on each interim dam to safely pass additional flows and reduce the risk to the downstream population to the extent practicable.
c. 2022	Results from hydraulic analyses of the existing unlined channel found erosion would occur during all but relatively minor spill events. This included erosion of the left channel bank, which may increase the likelihood for overtopping and breaching of the left channel bank. Negative impacts to the embankment dam were considered unlikely. However, overtopping and breaching of the left channel bank may negatively impact the high-level outlet structure. New alternatives were considered to safely pass a 500-year design flood. However, on February 8, 2022, DSOD stated that the proposed 500-year design flood was inadequate, and that design objective for improvements to the existing unlined channel should be the probable maximum flood.	Five new alternatives were considered to improve the existing unlined channel. In lieu of no improvements to the existing unlined channel, the new spillway will span the length of the existing spillway and the existing unlined channel.

Table 3. Reservoir Restrictions

Timeline	Restriction in Elevation	Storage with Restriction (% of Capacity)	Notes
December 2008	614.5 NGVD 29	76,749 (86.0%)	Valley Water proposed
January 2009	604.5 NGVD 29	65,961 (73.9%)	DSOD ordered
October 2010	588 NGVD 29	50,476 (56.5%)	Valley Water proposed and DSOD approved
April 2011	599.5 NGVD 29	60,979 (68.3%)	Valley Water proposed
June 2011	599.5 NGVD 29	60,979 (68.3%)	DSOD approved
February 2020	565 NAVD 88	31,694 (35.5%)	FERC directed
October 2020	490 NAVD 88	3,159 (3.5%)	FERC directed

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Table 4. ADSRP Affected Parcels

APN	Ownership	Project Use	Real Estate Need
728-34-011	Valley Water	Staging Area (Coyle Property)	None, owned by Valley Water
728-34-010	Private	Cochrane Road resurfacing and temporary tieback wall anchors	Temporary Construction Easement, Temporary Tieback Anchor Easement
728-25-016	Private	Access for air monitoring station	Permission to Enter
728-25-017	Private	Basalt Hill Borrow Area slope reinforcement	Property Acquisition (less than 0.18 ac)
728-25-018	Private	Basalt Hill Borrow Area slope reinforcement	Property Acquisition (less than 0.18 ac)
728-34-020	Santa Clara County	Staging Area 1E	Temporary Lease Agreement
729-46-001	Santa Clara County	Basalt Hill Borrow Area, slope reinforcement, and air monitoring stations	Temporary Lease Agreement, Property Acquisition (0.91 acres), Permanent Access Easement
728-34-021	Santa Clara County	Staging Area 1W	Temporary Lease Agreement
729-36-001	Santa Clara County	Staging Area 6	Property Acquisition (entire parcel)
817-18-034	Valley Water	Staging Area 5	None, owned by Valley Water
728-34-019	Valley Water	Bridge, LLOW discharge channel	None, owned by Valley Water
728-34-018	Valley Water	Tieback wall, dam construction	None, owned by Valley Water
728-34-017	Valley Water	Dam construction	None, owned by Valley Water
729-48-001	Valley Water	Dam construction, spillway, outlet works	None, owned by Valley Water
729-48-002	Valley Water	Haul Roads, stockpiles, Packwood Gravel Borrow Pit	None, owned by Valley Water
729-46-010	Valley Water	Haul Roads, stockpiles, Basalt Hill Borrow Area, Reservoir Disposal Area	None, owned by Valley Water
627-14-009	Valley Water	Haul Road, stockpile	None, owned by Valley Water
627-14-026	Valley Water	Haul Road, stockpile	None, owned by Valley Water
729-43-022	Private	Access for air monitoring station	Permission to Enter
729-26-003	Private	Access for air monitoring station	Permission to Enter
729-46-014	Santa Clara County	Air monitoring station	Permission to Enter/Temporary Lease Agreement
728-28-014	Public	Air monitoring station	Permission to Enter
725-01-030	Public	Air monitoring station	Permission to Enter
728-35-001	Santa Clara County	Air monitoring stations	Permission to Enter/Temporary Lease Agreement
728-34-008	Valley Water	Air monitoring station, Telemetry Line	None, owned by Valley Water

Table 5. Ogier Ponds Affected Parcels

APN	Ownership	Project Use	Real Estate Need
725-05-005	Private	Maintenance road at top of bank	Property Acquisition (less than 0.6 ac)
725-05-006	Private	Maintenance road at top of bank	Property Acquisition (less than 0.3 ac)
725-05-011	Private	Maintenance road at top of bank	Property Acquisition (less than 1.5 ac)
725-05-013	Private	Stockpile/staging area	Temporary Lease Agreement (less than 12.0 ac)
725-05-014	Private	Maintenance road at top of bank	Property Acquisition (less than 1.5 ac)
725-05-015	Private	Maintenance road at top of bank	Property Acquisition (less than 0.5 ac)
725-05-016	Private	Maintenance road at top of bank	Property Acquisition (less than 0.5 ac)
725-06-004	Private	Maintenance road at top of bank	Property Acquisition (less than 0.6 ac)
725-04-003	Santa Clara County	Access for construction	Temporary Lease Agreement (less than 0.2 ac)
725-04-003	Santa Clara County	Channel construction	Property Rights TBD (less than 32.7 ac)
725-05-002	Santa Clara County	Wetland construction, Stockpile/staging area	Property Rights TBD (less than 15.3 ac)
725-05-002	Santa Clara County	Channel construction	Property Rights TBD (less than 26.0 ac)
725-06-008	Santa Clara County	Channel construction	Property Rights TBD (less than 6.5 ac)
725-06-008	Santa Clara County	Wetland construction	Property Rights TBD (less than 1.2 ac)

Table 6. Phase 2 Coyote Percolation Dam Affected Parcels

APN	Ownership	Project Use	Real Estate Need
678-02-034	Santa Clara County	Access to construction site	Permission to Enter
678-02-032	Santa Clara County	Haul Roads, stockpiles, staging area	Permission to Enter/Temporary Lease Agreement
678-02-031	Santa Clara County	Access to construction site	Permission to Enter
678-02-030	Valley Water	fish lane/pond berm work	None, owned by Valley Water
678-02-009	Valley Water	Radial gate/ponding area work	None, owned by Valley Water