SFPUC Alameda Creek Watershed San Antonio Creek (Grazing Unit 17) Alameda County, California

Hetch Hetchy
Regional Water System
Services of the San Francisco Public Utilities Commission

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February 3, 2026

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Acronyms

AUMs	animal unit months
AUY	animal unit year
BGEPA	Bald and Golden Eagle Protection Act
BHR	Bioregional Habitat Restoration
BMPs	Best Management Practices
Cal-IPC	California Invasive Plant Council
CEQA	California Environmental Quality Act
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CRPR	California Rare Plant Rank
EBRPD	East Bay Regional Park District
EDRR	Early Detection and Rapid Response
Grazing Unit 17	San Antonio Creek
GU	Grazing Unit
GU-17	San Antonio Creek
GUMP	grazing unit management plan
ID	Identification
IPM	Integrated Pest Management
MBTA	Migratory Bird Treaty Act
NNIP	non-native invasive plant
NRCS	Natural Resources Conservation Service
RDM	residual dry matter
RMP	Rangeland Management Plan
SFPUC	San Francisco Public Utilities Commission
USFWS	United States Fish and Wildlife Service
WMP	Watershed Management Plan

1. Introduction

1.1 Purpose of Grazing Unit Management Plan

This grazing unit management plan (GUMP) outlines the existing conditions and rangeland management goals for the San Antonio Creek (Grazing Unit 17 [GU-17]) lease. This document establishes management expectations between the San Francisco Public Utilities Commission (SFPUC) and the tenant for the grazing unit and guides program operations and capital improvements to achieve the SFPUC's Rangeland Management Plan (RMP) goals. This GUMP is consistent with and informed by the watershed-wide RMP, the Alameda Watershed Management Plan (WMP), and the Water Enterprise Environmental Stewardship Policy in which the SFPUC commits to proactively managing the watersheds in a manner that maintains the integrity of natural resources, restores habitats for native species, and enhances ecosystem function.

1.2 Rangeland Management Program

The SFPUC developed the Alameda Creek Watershed RMP to document the rangeland management program for livestock grazing applied across the SFPUC-owned and -managed grazing units of the Alameda Creek Watershed. The RMP establishes a rangeland management program that is consistent with plans and policies that apply to management of SFPUC watershed lands, as well as with current best practices in rangeland management.

The goals of the SFPUC rangeland management program are to:

- Protect and improve water quality;
- Preserve and enhance the health of ecological systems;
- Reduce the threat of wildland fire by decreasing fuel densities;
- Adaptively manage the RMP lands based on new information and conditions;
- Provide a basis for consistent management of the RMP lands; and
- Support an economically and ecologically sustainable grazing operation.

1.3 Rangeland Management Plan Objectives

To achieve these goals, the RMP outlines broad management objectives to protect water quality and natural resources. These objectives include the following:

- Maintain sufficient vegetative residual dry matter (RDM) to protect soil and water quality.
- Minimize negative impacts to sensitive aquatic habitats such as riparian and spring systems.
- Implement rangeland management practices that preserve and protect special-status species and their habitats.
- Maintain or improve native species biodiversity.
- Monitor and control non-native invasive plant (NNIP) and wildlife populations.
- Reduce the risk of introduction or spread of plant diseases, particularly from human activities.

- Reduce sediment sources to riparian habitats associated with road systems and insufficient vegetative cover.
- Reduce risk of introducing livestock- and wildlife-related pathogens into waterways of the RMP lands.

The RMP also includes the following objectives to promote effective administration of the grazing units:

- Use the results of monitoring and routine inspections to adaptively manage the RMP lands.
- Effectively communicate and implement rangeland management goals and expectations with the RMP grazing tenant(s).
- Consult with SFPUC rangeland staff and RMP grazing tenant(s) during the development of any policies that would change the management of RMP lands.
- Implement cost-sharing rangeland improvement projects between the SFPUC and its grazing tenant(s) in the RMP lands.
- Use grazing to manage wildland fuel loads.

2. Lease Overview

2.1 San Antonio Creek Lease, Grazing Unit 17

The San Antonio Creek lease covers Grazing Unit 17 (GU-17), which consists of approximately 5,806 acres (231 of which are currently excluded from grazing) in the northern portion of the SFPUC Alameda Creek Watershed (Figure 1). The grazing unit is named for San Antonio Creek, an intermittent stream running through the grazing unit that drains through a flat valley bottom into San Antonio Reservoir. The grazing unit borders the eastern portion of the 825-acre San Antonio Reservoir and includes the 627-acre San Antonio Creek Bioregional Habitat Restoration (BHR) site and the 190-acre Grimes BHR site, which are under a conservation easement in perpetuity. Primary access to the grazing unit is via Ranch Road. GU-17 is bordered by East Bay Regional Park District (EBRPD), Zone 7 Water Agency, and private lands. The primary land uses in the surrounding areas are cattle grazing, open space/recreation, and open space/private land. Elevations range from 463 to 2,196 feet above sea level. A future, large-scale gravel mining operation is planned for private lands on Apperson Ridge, an area that borders GU-17 to the southwest.

2.2 Environmental Conditions

Topography in the San Antonio Creek grazing unit ranges from open, moderately sloped annual grasslands in the northern and central portions of the grazing unit to more rugged, hilly, wooded terrain in the southern and eastern portions of the grazing unit. Major water features in the grazing unit include three intermittent streams (San Antonio Creek, Indian Creek, and La Costa Creek) that drain to San Antonio Reservoir. Numerous ephemeral drainages are present throughout the grazing unit; many of these drainages are associated with seasonal wetlands, such as the Courthouse Pond drainage. Ponds, including several large, perennial ponds, are found throughout the grazing unit and in various fields. Perennial ponds are mostly located in the western and central portions of the grazing unit. The few springs found in the grazing unit are mostly in the middle to upper portions of the watershed located in the middle to southern portion of the grazing unit. Most springs produce low to moderate flow.

2.3 Easements

The San Antonio Creek grazing unit contains road access easements on Ranch Road as well as an unnamed stretch of road that provides access from Ranch Road at the San Antonio Creek Bridge to private property north of the grazing unit. Roads through the grazing unit provide access, in part, to the private lands located to the east, north, and south of the grazing unit. The Fletcher Ranch LLC has a permanent access easement on Ranch Road, which passes through the grazing unit. Other entities use Ranch Road to access adjacent lands; however, they do not have deeded access. A short section of the South Bay Aqueduct operated by the Department of Water Resources runs through the northwest corner of the grazing unit. Periodically water may be discharged out a turnout/blowoff valve located adjacent to Ranch Road near a stream flowing to San Antonio Reservoir. Maintenance and operation of the aqueduct should not affect grazing operations.

The San Antonio Creek BHR site and associated easement total approximately 627 acres, which include a 1.8-mile reach of San Antonio Creek and approximately 0.6 mile of Indian Creek. The BHR site is comprised of a 230.6-acre grazing exclusion area and 395 acres of mostly grassland, seasonal wetland, and pond enhancement. Grazing in the enhancement area is generally consistent with surrounding fields. The cattle exclusion area around most of the San Antonio Creek valley and lower portion of Indian Creek contains numerous native plantings. There is cross fencing within the exclusion area. This cross fencing could be used to manage cattle in the exclusion area if grazing is permitted by the SFPUC into this area in the future; however, the condition of the cross fencing will need to be assessed prior to introducing cattle into the exclusion area.

The Grimes BHR site is a 190-acre easement situated on the southern border of the lease on the ridgeline between San Antonio Creek and Williams Gulch. No current (2025) grazing restrictions occur within the site. The BHR sites are managed to meet goals and objectives as dictated by environmental permits and a long-term management plan. As such, the SFPUC or its representatives may need to work with the tenant to adjust grazing practices to meet legal requirements for the BHR sites.

2.4 Managed Riparian Areas

The grazing unit includes Managed Riparian Areas shown in Figure 2. Originally adopted in the 1997 Grazing Resources Management Plan and the 2001 Alameda WMP, Managed Riparian Areas are buffers around streams that are restricted from grazing to protect water quality for both habitat and source water protection. The SFPUC's Watershed Resources Manager may approve seasonal prescribed grazing in Managed Riparian Areas to protect the watershed and natural resources, for example to reduce wildfire risk, control NNIPs, and support special-status species.

2.5 Grazing Operation

Since 1994, the San Antonio Creek grazing unit has been managed as a combination operation including seasonal stockers (yearlings) and year-round cow/calf pairs. Stockers are shipped into the grazing unit around November and shipped out of the grazing unit in early June. During the growing season, cattle are spread throughout the grazing unit, and during the dry season cattle are moved to the western and central portion of the grazing unit where water is more readily available.[1] Processing fields are located in the vicinity of San Antonio Creek, near the BHR site

[1] Nielson, Jeff, and Robert, grazing tenants, San Antonio Lease, in-person communication with former URS Rangeland Ecologist Dina Robertson, 2013.

and off of Ranch Road. As of 2016, the Alley Field is not currently grazed as a part of the San Antonio Creek lease.

2.6 Stocking Rates

Recorded stocking rates for the grazing unit from 1998 to 2015 averaged approximately 4,510 animal unit months (AUMs), or 1.3 acres per AUM (15.5 acres per animal unit year [AUY]).

Productivity varies across the unit, with higher forage productivity in the north, west, far east, and central portions of the grazing unit (e.g., Olds Field, 1200 Field, Indian Field, and Courthouse Field), and lower productivity in the southern and eastern portion of grazing unit (Williams Gulch, Grimes, and upper Indian Creek).

Estimated grazing capacity and stocking rates for the lease were determined using Natural Resources Conservation Service (NRCS) soil productivity rates adjusted by vegetative cover and a fall RDM target of 1,000 pounds per acre. The baseline grazing capacity for the San Antonio Creek grazing unit is 4,257 AUMs and will be adjusted annually by the SFPUC based on forage productivity, infrastructure updates, RDM levels, and vegetation condition.

3. Biological Conditions

3.1 Habitat Conditions

The San Antonio Creek grazing unit includes a wide range of plant communities. Sycamore alluvial woodlands border the intermittent streams (San Antonio Creek, Indian Creek, and La Costa Creek), predominately in the broader valley bottoms. Vegetation in uplands surrounding the alluvial valleys includes annual grassland and oak savanna. Upper portions of the grazing unit have steep slopes with dense vegetation and rocky outcrops with shrub and oak woodland habitats (Williams Gulch and upper San Antonio and Indian creeks). Most ponds within the grazing unit are in suitable condition with healthy emergent vegetation to support amphibians. The grazing unit has areas of serpentine bedrock and Franciscan mélange, which have the potential to include serpentine outcrops. These areas have the potential to support rare plants and plant communities and may have naturally occurring asbestos.

The San Antonio Creek and Grimes BHR sites lie within the grazing unit and are managed to enhance habitat for listed species. Grazing is restricted within the riparian corridors of San Antonio and Indian creeks, unless prescribed by the SFPUC. There are known populations of protected plant and animal species onsite. While there are signs of healthy sycamore and oak recruitment, some mature trees onsite are also in decline. Soils in the grazing unit are considered erosive and large slumps and erosional areas contribute sediment to the reservoir tributaries.

The pathogen that causes sudden oak death has been introduced into San Antonio Creek, so access to those areas requires decontamination before and after entry. Trees within the exclusion areas are tubed and caged to prevent vole and deer herbivory. The tenant will support SFPUC staff to protect sensitive habitats onsite, including sycamore riparian forest, oak woodland, seasonal wetland, sage scrub, native grassland, and pond.

3.2 Special-Status Species

The species known to occur in the grazing unit that are subject to regulation by the State of California and the federal government are listed in Table 1. The grazing unit contains United

States Fish and Wildlife Service (USFWS) designated critical habitat for California red-legged frog (*Rana draytonii*) and proposed critical habitat for foothill yellow-legged frog (*Rana boylii*), although the latter species has not been documented in the grazing unit. Many occurrences of California tiger salamander (*Ambystoma californiense*) are recorded in the San Antonio Creek grazing unit in association with stock ponds and waterways, particularly in the western half of the lease. California red-legged frogs also occur in association with ponds and springs in similar areas of the grazing unit. Western pond turtles (*Emys marmorata*) have been observed in numerous ponds, especially in the BHR site along San Antonio Creek. Western burrowing owls (*Athene cunicularia*) (wintering) have been observed in the grazing unit, just north of the reservoir off Ranch Road. Six breeding pairs of golden eagles (*Aquila chrysaetos*) have territories that overlap with this grazing unit, and there is a pair of bald eagles (*Haliaeetus leucocephalus*) nesting along Indian Creek. Alameda whipsnake (*Masticophis lateralis euryxanthis*) habitat is extensive in GU-17, with recorded occurrences in Williams Gulch and Grimes. Populations of California larkspur (*Delphinium californicum* ssp. *interius*) have been found in Williams Gulch in the eastern portions of the grazing unit.

In addition to the species in Table 1, this grazing unit has occurrences of 18 plant species identified by the East Bay Chapter of the California Native Plant Society (CNPS) as locally Rare, Unusual, and Significant[2] (Table 2). These species are significant because in Alameda County they are in decline; reach their range limit; and/or occur in habitats that are limited, isolated, or threatened. The table also includes the California Department of Fish and Wildlife's Watch List species, which need more information to clarify status. Plants and animals in Table 2 are within the purview of the Stewardship Policy[3] and may be monitored and managed by SFPUC staff.

3.3 Native Vegetation Objectives

The Alameda WMP outlines general native vegetation goals that include the following:

- Protect, conserve, and enhance wetlands and riparian communities.
- Protect and restore unique, local, and/or indigenous plant species to maintain biodiversity and specialized habitat values.
- Manage grasslands and rangelands to balance, wherever possible, wildlife habitat values, the restoration of native perennial species, and the reduction of fuel loads and noxious weeds.
- Manage shrub communities to reduce fuel loads, prevent soil erosion and sedimentation, improve wildlife habitat access and use, and control invasive plants.
- Manage woodlands and forests to maintain healthy, vigorous, and diverse stands with a multiplicity of age and size classes.

[2] Database of Rare, Unusual and Significant Plants of Alameda and Contra Costa Counties: https://ebcnps.org/ebrare-plant-database/.
[3] San Francisco Public Utilities Commission, Water Enterprise Environmental Stewardship Policy, June 27, 2006.

Table 1 Special-Status Species Observed in San Antonio Creek (GU-17)

Common Name	Scientific Name	Listing Status[1]
Wildlife/Fisheries		
Alameda whipsnake	*Masticophis lateralis euryxanthis*	FT, ST
Bald eagle	*Haliaeetus leucocephalus*	BGEPA, MBTA, FDR, SE, SP
California red-legged frog	*Rana draytonii*	FT, CH, SSC
California tiger salamander	*Ambystoma californiense*	FT, ST
Coast horned lizard	*Phrynosoma coronatum rontale*	SSC
Ferruginous hawk	*Buteo regalis*	MBTA, SSC
Golden eagle	*Aquila chrysaetos*	BGEPA, MBTA, SP
Loggerhead shrike	*Lanius ludovicianus*	MBTA, SSC
Short-eared owl	*Asio flammeus*	MBTA, SSC
Western burrowing owl	*Athene cunicularia*	MBTA, SC, SSC
Western pond turtle	*Actinemys marmorata*	FPT, SSC
White-tailed kite	*Elanus leucurus*	MBTA, SP
Plants		
Diablo helianthella	*Helianthella castanea*	CRPR 1B.2, CNPS A2
Hospital Canyon larkspur	*Delphinium californicum* ssp. *interius*	CRPR 1B.2, CNPS A2
Narrowleaf milkweed	*Asclepias fascicularis*	Host plant for the FPT Monarch butterfly

[1] Sources:
California Natural Diversity Database (CNDDB), "State and Federally Listed Endangered, Threatened, and Rare Plants of California" and "Special Animals List," California Department of Fish and Wildlife. Sacramento, CA, July 2025;
Lake, Dianne, Rare, Unusual and Significant Plants of Alameda and Contra Costa Counties (web application), Berkeley, California, 2025; East Bay Chapter of the California Native Plant Society (CNPS) (a nonprofit organization),: https://ruspdb.ebcnps.org/cgi-bin/ebrare/ebrare.cgi, accessed July 2025.

Federal Status:
- CH = Critical Habitat
- FT = Federally listed as threatened
- FPT = Federally proposed for listing as threatened
  - Western pond turtle is proposed to be listed as threatened as of October 2023; pending finalization (88 FR 68370)
  - Monarchs are proposed to be listed as threatened as of December 2024; pending finalization (89 FR 100662)
- FDR = Federally Delisted (Recovered)
- BGEPA = Bald and Golden Eagle Protection Act
- MBTA = Migratory Bird Treaty Act

California (State) Status:
- SE = State listed as endangered
- ST = State listed as threatened
- SC = State candidate for listing as endangered
- SP = Fully protected. A fully protected species may not be taken or possessed at any time, except as specified in the Fish and Game Code.
- SSC = California Species of Special Concern

California Rare Plant Rank (CRPR) and Threat Ranks:
- 1B = Plants that are rare, threatened or endangered in California, most of which are endemic.
- 0.2 = Moderately threatened in California (20-80% occurrences threatened / moderate degree and immediacy of threat)

CNPS Local Listing:
- A2 = Species currently known from three to five regions in Alameda and Contra Costa Counties, or, if more, meeting other criteria such as small populations, stressed/declining populations, small geographic range, limited/threatened habitat.

Table 2 Locally Rare and Watch List Species Observed in San Antonio Creek (GU-17)

Common Name	Scientific Name	Listing Status[1]
Wildlife		
Sharp-shinned hawk	*Accipiter striatus*	MBTA, WL
Prairie falcon	*Falco mexicanus*	MBTA, WL
Horned lark	*Eremophila alpestris*	MBTA, WL
American peregrine falcon	*Falco peregrinus anatum*	MBTA, FDR
Plants		
Bigelow thistle	*Cirsium occidentale* var. *californicum*	CNPS A2
California horkelia	*Horkelia californica*	CNPS A1
Jepson's woolly sunflower	*Eriophyllum jepsonii*	CRPR 4.3, CNPS A2
Santa Clara thorn-mint	*Acanthomintha lanceolata*	CRPR 4.2, CNPS A2
Stinging phacelia	*Lessingia nemaclada*	CNPS A2
Stinkbells	*Fritillaria agrestis*	CRPR 4.2, CNPS A2

[1] Sources:
California Natural Diversity Database (CNDDB), "Special Animals List," California Department of Fish and Wildlife. Sacramento, CA, July 2025;
Lake, Dianne, Rare, Unusual and Significant Plants of Alameda and Contra Costa Counties (web application), Berkeley, California, 2025; East Bay Chapter of the California Native Plant Society (CNPS) (a nonprofit organization), https://ruspdb.ebcnps.org/cgi-bin/ebrare/ebrare.cgi, accessed July 2025.

Federal Status:

FDR = Federally Delisted (Recovered)
MBTA = Migratory Bird Treaty Act

California (State) Status:

WL = Watch List

California Rare Plant Ranks (CRPR) and Threat Ranks:

4 = Plants of limited distribution, a watch list.
0.2 = Moderately threatened in California (20-80% occurrences threatened / moderate degree and immediacy of threat)
0.3 = Not very threatened in California (less than 20% of occurrences threatened / low degree and immediacy of threat or no current threats known)

CNPS Locally Rare Status Codes protected under the California Environmental Quality Act (CEQA):

A1 = Species currently known from two or less regions in Alameda and Contra Costa counties.
A2 = Species currently known from three to five regions in Alameda and Contra Costa counties, or, if more, meeting other criteria such as small populations, stressed/declining populations, small geographic range, limited/threatened habitat.

Specific native vegetation strategies that apply to this grazing unit are listed in Table 3.

Table 3 Objectives and Strategies for Managing Native Vegetation

Objectives from the RMP	Grazing Unit Strategy
OBJECTIVE 1: Maintain sufficient RDM to protect soil and water quality.	• Evaluate erosional features or areas where soil is exposed with limited vegetation, such as Indian Creek and upstream reaches of San Antonio Creek. If necessary, install temporary and/or permanent cattle exclusion fencing or other measures to prevent erosion and promote plant growth. • Allow sufficient time for vegetation to recover prior to resuming grazing. • Temporarily and strategically exclude grazing from compacted areas of drainages and erosional slumps following restoration efforts (e.g., planting and caging).
OBJECTIVE 2: Minimize negative impacts to sensitive aquatic habitats such as riparian and spring systems.	• Do not allow cattle into exclusion areas without permission and guidance from the SFPUC. • Additional pond exclusions may be implemented in the future to facilitate vegetation growth around pond edges. • Ensure water troughs and mineral supplements are working properly are adequately stocked and utilized by the cattle, adjusting locations if necessary. Install cattle watering systems in a manner that avoids degrading sensitive upland habitat areas or contributing to erosion. (e.g., non-functioning troughs should be repaired or relocated to non-sensitive upland habitats if currently located in drainages or valleys).
OBJECTIVE 3: Implement rangeland management practices that preserve and protect special-status species and their habitats	• Adapt rangeland management practices, as necessary, to support special-status species; incorporate the latest research and local expertise (ranchers, scientists, land managers).
OBJECTIVE 4: Maintain or improve native species biodiversity	• All dead wood should be left onsite and may be distributed under large trees to prevent loafing and protect root zones.
OBJECTIVE 6: Reduce the risk of introduction or spread of plant diseases, particularly from human activities.	• Do not enter exclusion areas without permission and guidance from the SFPUC.

RMP Rangeland Management Plan
SFPUC San Francisco Public Utilities Commission

3.4 Non-Native Invasive Plants

SFPUC's Integrated Pest Management (IPM) program focuses on:

- Protecting rangeland productivity by reducing NNIPs that negatively impact forage quality; and
- Protecting high value habitat and ecosystem services by reducing the introduction or spread of NNIPs and plant pathogens.

A reconnaissance-level survey of NNIP species was conducted in 2009 and 2020 in the watershed.[4] This survey was spatially limited to select areas (along roads and other places more easily reached by foot) and not all species were identifiable at the time of the surveys. In 2025, SFPUC staff conducted a survey to update occurrences and priorities for management. Table 4 lists non-native invasive plants identified in the lease during the 2009 and 2020 survey, the 2025 staff survey, and discussions with the current tenant and SFPUC grazing manager. Species detections noted during periodic site visits may or may not have coincided with the optimal timing to identify certain NNIP species. The table also includes the California Invasive Plant Council (Cal-IPC) rating and the invasion curve level.[5] The SFPUC prioritizes management actions (i.e., prevention, eradication, or containment) based on invasion curve levels 1 through 4, which depict the area infested over time.

Several species of NNIPs (Table 4) occur in GU-17. Most NNIPs in GU-17 occur in areas that are or were disturbed in the past, such as pond embankments, corrals, holding and processing fields, roads and trails edges, the former BHR staging area, and the reservoir edge. Weed management efforts in the grazing unit include spot treatment of artichoke thistle (*Cynara cardunculus* subsp. *flavescens*) in Williams Gulch, eradication of pampas grass (*Cortaderia sp.*) from the shores of San Antonio Reservoir, mowing of barb goatgrass (*Aegilops triuncialis*) along Ranch Road, and spot treatments of oleander (*Nerium oleander*), tamarisk (*Tamarix parviflora*), giant reed (*Arundo donax*), Himalayan blackberry (*Rubus armeniacus*), and yellow starthistle (*Centaurea solstitialis*) along Upper la Costa Creek, and extensive stinkwort (*Dittrichia graveolens*) treatments within and around the San Antonio Creek BHR conservation easement. These control efforts have been implemented by SFPUC staff, the Alameda County Department of Agriculture, and the lessee of GU-17.

There are two BHR sites under a long-term management plan that involves a higher level of monitoring and maintenance than other leases.

[4] Nomad Ecology, Non-indigenous Plant Species Inventory and Mapping Alameda Watershed, Alameda and Santa Clara Counties, California, Prepared for the SFPUC, 2009; and Nomad Ecology, 2020 Alameda Watershed Invasive Plant Report, Prepared for the SFPUC, December 2020.

[5] Department of Primary Industries, *Invasive plants and animals: policy framework*, Victoria Department of Primary Industries, Melbourne, Australia, 2010.

Table 4 Non-Native Invasive Plants Managed in San Antonio Creek (GU-17)

Common Name	Scientific Name	GU-17 Invasion Curve Level[1]	Cal-IPC Rating[2]
Bermuda buttercup	*Oxalis pes-caprae*	1	High
Cape ivy	*Delairea odorata*	1	Moderate
Caper spurge	*Euphorbia lathyris*	1	Watch
English ivy	*Hedera helix*	1	High
French broom	*Genista monspessulana*	1	High
Fuller's teasel	*Dipsacus sativus*	1	Moderate
Jubata/ Pampass grass	*Cortaderia* sp.	1	Limited
Tree tobacco	*Nicotiana glauca*	1	High
Artichoke thistle	*Cynara cardunculus* subsp. *flavescens*	2	Moderate
Barb goatgrass	*Aegilops triuncialis*	2	Moderate
Fennel	*Foeniculum vulgare*	2	High
Giant reed	*Arundo donax*	2	High
Himalayan blackberry	*Rubus armeniacus*	2	High
Oleander	*Nerium oleander*	2	none
Purple starthistle	*Centaurea calcitrapa*	2	Moderate
Rosy sandcrocus	*Romulea rosea*	2	High
Rush skeletonweed[3]	*Chondrilla juncea*	2	Moderate
Tamarisk, Salt Cedar	*Tamarix parviflora*	2	Moderate
Vinca	*Vinca major*	2	High
Whitetop	*Lepidium latifolium/ Lepidium draba*	2	Moderate / High
Harding grass	*Phalaris aquatica*	3	High
Stinkwort	*Dittrichia graveolens*	3	Moderate
Tocalote	*Centaurea melitensis*	3	High
Yellow starthistle	*Centaurea solstitialis*	3	High
Medusahead	*Elymus caput-medusae*	4	Moderate
Poison hemlock	*Conium maculatum*	4	Moderate

IPM = Integrated Pest Management
SFPUC = San Francisco Public Utilities Commission

[1] NNIP Management Approach by Level on Invasion Curve:
1. Prevention: SFPUC IPM will conduct Early Detection and Rapid Response (EDRR) surveys.
2. Eradication: SFPUC IPM will treat to eradicate.
3. Containment: SFPUC IPM will treat to protect high value resources or to eradicate isolated populations.
4. Widespread: SFPUC IPM will focus on long-term management and asset-based protection.

[2] California Invasive Plant Council (Cal-IPC) ratings (Cal-IPC 2024) rate NNIPs based on dispersal rate and environmental impact (https://www.cal-ipc.org/plants/inventory/).

[3] Species managed within the BHR conservation easement.

To help reduce NNIPs, expectations of tenants include the following:

- Attend an annual SFPUC training regarding NNIP Best Management Practices (BMPs).
- Report to the SFPUC any new observations of the following species:
    - Artichoke thistle, barb goatgrass, fennel, giant reed, Himalayan blackberry, oleander, purple starthistle, rosy sandcrocus (*Romulea rosea*), rush skeletonweed (*Chondrilla juncea*), tamarisk, vinca (*Vinca major*), and whitetop (*Lepidium latifolium/ Lepidium draba*).
- When cattle are transported onto the grazing unit, notify the SFPUC and as feasible implement appropriate BMPs such as:
    - Provide weed-free forage or pelletized feed (approved by the SFPUC) to cattle for at least three days before transport onto the grazing unit.
    - Utilize a transitional pasture within the grazing unit.
    - Decontaminate vehicles and equipment entering the grazing unit according to the SFPUC's decontamination policy

3.1 Nuisance Wildlife

California ground squirrels (*Otospermophilus beecheyi*) are numerous throughout the grazing unit; colonies are very large and extensive relative to other leases.

4. Rangeland Infrastructure

A detailed grazing infrastructure survey of the watershed was conducted from 2013 to 2015, with additional mapping in 2023 at the San Antonio Creek BHR site The number, condition, and location of various types of infrastructure such as barns, corrals, springs, and troughs were assessed and are summarized in this section. The grazing infrastructure data were reviewed and updated in 2025 and are shown on Figure 2. This section of the GUMP also outlines recommendations for rangeland improvements.

4.1 Roads

Roads – GU-17 has 36.0 miles of vehicle-accessible unpaved road. Three primary roads are used for access to GU-17: Ranch Road and two unnamed improved dirt roads. Ranch Road is an improved graveled road that begins at Vallecitos Lane near Highway 84 and terminates just beyond the bridge crossing at San Antonio Creek. From the end of Ranch Road, Indian Creek Road heads east toward Williams Gulch and west to the Government Field. Several additional dirt roads provide access to the lower portion of Indian Creek (up to the Hetch Hetchy Aqueduct), La Costa Creek, the Olds Field, and other parts of the grazing unit. Primary roads in GU-17, including Ranch Road, are generally passable in wet weather; however, most of the secondary roads are not. While erosional issues are common on the roads, most are drivable in dry conditions with four-wheel drive providing access to most of the grazable acreage in the grazing unit.

Recommendations – GU-17 is well served by a network of roads. Primary roads are regularly maintained. However, many roads in GU-17 have erosion caused by the configuration of the road or other factors (gullies, cutslope and fill slope erosion, culvert failure, etc.).

4.2 Fences

Fences – GU-17 contains over 30 miles of perimeter and cross fencing. Perimeter fencing surrounds the majority of the grazing unit, and in some locations also provides a barrier between San Antonio Reservoir and the grazing unit. Perimeter fencing around the Olds Field is incomplete. Fencing in Williams Gulch around the northeast boundary with the Zone 7 property, and on the southern border of San Antonio Creek out to Grimes, is lacking and/or in disrepair. Interior cross fencing is present throughout the grazing unit as well as within the BHR site.

Recommendations – GU-17 requires both new fencing and repairs to existing fences. A full assessment of fence locations and condition is needed for this grazing unit. The fencing protecting San Antonio Reservoir from the Government Field and Indian Field needs replacement. The SFPUC is currently working with the adjacent landowner to replace the southwest corner of boundary fencing. Fencing in the southeast along Patterson Ranch needs replacement. The exclusion fencing around Indian Creek Managed Riparian Area is in need of significant repairs and/or replacement. Fencing used to exclude cattle from the reservoir and Indian and San Antonio creeks should be regularly checked and repaired as necessary to maintain the cattle exclusion area. Fence lines should be routinely checked prior to shipping in cattle or following significant rain/windstorms. Gates and fence braces should be routinely checked, maintained, adjusted, and greased as needed by the grazing tenant or the SFPUC as much of the fence is in poor condition and requires frequent repairs. In some areas of GU-17, fencing may not be necessary due to natural boundaries created by terrain and vegetation.

4.3 Corrals and Barns

Corrals and Barns – GU-17 contains one centralized functioning corral, as of 2025. The grazing unit also contains a wire trap corral located at the far eastern end of Williams Gulch; however, this facility has not been maintained for many years.[6] The remains of a third non-functioning corral are present along Williams Gulch downstream of Goat Rock near the spur road to the Grimes BHR site. A small corral consisting of makeshift fence panels and no permanent water source within the enclosure is located in the far northwestern portion of the grazing unit adjacent to Ranch Road. The “wiretrap” corral located in the eastern portion of the lease is in disrepair and not in use.

Recommendations – The corral located adjacent to San Antonio Creek just east of the BHR site may be moved to a new location due to difficulties with accessing the corral through the low water crossing with cattle trucks following large storms.[7] The proposed new location is within the Holding Field on the south side of San Antonio Creek to avoid the need to cross through San Antonio Creek. Construction of a second corral is proposed in the 1200 Field on the northern side of the San Antonio Creek BHR site. This corral would circumvent the difficulty of moving cattle north to south across the San Antonio Creek Bridge or around the BHR site. Water for the proposed corral location would be supplied by water tanks filled from a pump located in the reservoir currently used for irrigation of mitigation plantings within the BHR site.

4.4 Water Sources

Water Sources – GU-17 supports few natural springs compared to other watershed grazing units. As a result, there are not as many troughs in the grazing unit as there are in other grazing

[6] Nielson, Jeff and Robert, grazing tenants, SFPUC San Antonio Lease, in-person communication with URS Rangeland Ecologist Dina Robertson, 2013.
[7] Koopmann, T., in-person communication with former URS Rangeland Ecologist Dina Robertson, 2016.

units. The water sources for troughs in the grazing unit include springs, groundwater collection systems, well(s), and tanks filled from a water truck. A new well was drilled in 2025. The locations of springs, troughs, tanks, wells, and other water infrastructure are shown in Figure 2.

There are 52 ponds in GU-17 (Table 5). Ponds are the primary water source throughout GU-17. Many of the ponds are in disrepair, and some have been failing or have not held water for some time. Other ponds were not properly constructed or have an insufficient clay soil lining and are not reliable water sources since they only hold water for short periods of time following rainfall. For most ponds in the grazing unit, erosional headcuts are present below spillways and erosion and sedimentation is common in and around the ponds. Several of the ponds are fed by seeps, while others collect surface runoff and/or stream flow. Williams Gulch does not have large perennial ponds like other portions in GU-17, and only has a few perennial developed and undeveloped springs. Portions of several intermittent drainages and numerous ephemeral drainages provide water to cattle in this area during wet periods. Most of the springs in the grazing unit are located in the southern and eastern half of the grazing unit where the bedrock geology is more conducive to supplying water. The geology in the rolling hills in the middle to northern half of the grazing unit consisting of deep alluvial deposits is not conducive to supporting springs. Where springs are not to be found, underground water collection systems provide water to troughs in a couple of locations by collecting subsurface water via perforated pipes installed in the ground where a reliably high water table can be found.

Table 5 2012-2015 Pond Assessment Results for San Antonio Creek (GU-17)

Pond ID	Pond Condition	Water Source
PA005	Moderate condition. Bank erosion is evident, and spillway is deeply eroded. Many California ground squirrel burrows are present in embankment.	Surface runoff, stream flow
PA008	Moderate condition. Embankment is in good condition with some seepage emerging on the downstream toe. Spillway is in good condition but is causing bank erosion, undermining trees farther downstream at a confluence with the creek. No active erosion or sedimentation that would affect the pond integrity is occurring at this time.	Stream flow, surface runoff
PA017	Poor condition. Severe embankment erosion. Possible soil piping through the embankment via rotted roots from a fallen oak tree or from California ground squirrel burrows (many present throughout the embankment).	Shallow concentrated flow, surface runoff
PA018	Good condition. Drainage to pond has several headcuts. Spillway has small rill/gully erosion (but not very active) with headcuts ~0.5 to 2.5 feet deep, 2 to 5 feet wide, 60 feet long, 50 feet from spillway crest. Embankment is in good condition (some California ground squirrel burrows).	Shallow concentrated flow, surface runoff, seep (~300 feet upstream)
PA019	Good condition. Spillway is in good condition with pipe and armored outfall present. Small pool is present at the pipe outfall. Some California ground squirrel burrows are present in the embankment but do not appear to be affecting the integrity.	Roadway drainage, surface runoff
PA025	Good condition. Pond dries out later in the season.	Surface runoff

Table 5 2012-2015 Pond Assessment Results for San Antonio Creek (GU-17)

Pond ID	Pond Condition	Water Source
PA028	Good condition. Spillway has gully erosion on lower extent with a 2.5-foot-deep headcut (100 feet downstream of the crest of the spillway) and four additional nick points downstream. There are signs of erosion from steep adjacent slopes. There is a small slump on western edge of pond. California ground squirrel burrows are present in the embankment.	Stream flow, surface runoff
PA030	Poor condition. Embankment/spillway is completely eroded (6 to 10 feet deep). Pond is very overgrown with mulefat (*Baccharis salicifolia*) and weeds. High natural resource potential.	Stream flow, surface runoff
PA031	Good condition. There is a shallow vernal pool associated with an old landslide.	Sheet flow
PA037	Moderate condition. Some gopher activity is evident on embankment. Spillway has a 2-foot active headcut approximately 100 feet downstream of the pond.	Stream flow, surface runoff
PA042	Moderate condition. Pond has lots of sediment in the bottom from high cattle usage. No spillway is present. Pond integrity may eventually be threatened by cattle damage of the embankment when soils are wet.	Surface runoff
PA052	Moderate condition. Erosion is present on the lower 85 feet of the spillway with several nickpoints up to 1.2 feet deep. Not too much silt is in the pond bottom. A water infiltration system feeds a trough upstream of the pond.	Seep, shallow concentrated flow, surface runoff
PA053	Good condition. Pond appears to have been regraded in the recent past. Rill erosion is present on the steep north and northeast pond bank. Pond outlet has minor erosion. Embankment has some California ground squirrel burrows.	Surface runoff, shallow concentrated flow
PA054	Good condition. Lower end of the spillway has gully erosion where the spillway grading ended and flow drops into the natural drainage. A soil slump occurred between the spillway and embankment. Some vertical banks are present on north side. Embankment is in good structural condition overall.	Surface runoff
PA055	Poor condition. Embankment has failed/eroded. Pond is dry but holds some water. Pond could easily be rehabilitated by re-grading the embankment. Gully erosion is occurring upstream of the pond.	Shallow concentrated flow, surface runoff
PA056	Good condition. Gully erosion is present on the spillway (1 to 1.5 feet deep by 25 feet long) within ~20 feet of the pond. The embankment has a soil slump (~2 feet by 6 feet by 5 feet).	Seep, surface runoff, shallow concentrated flow

Table 5 2012-2015 Pond Assessment Results for San Antonio Creek (GU-17)

Pond ID	Pond Condition	Water Source
PA059	Good condition. The pond inlet has some minor gully erosion (2 feet wide by 2 feet deep by 20 feet long). The spillway has some old gully erosion that is healed over with vegetation.	Stream flow, surface runoff, small seep pond adjacent to main pond
PA061	Moderate condition. The pond embankment spills at an elevation approximately 2 feet below the spillway elevation. Pond overflow has eroded the base of the embankment.	Seep
PA062	Good condition. Pond has recently been reconditioned, but the new un-vegetated/unarmored spillway is eroding downstream of the 18-inch culvert. Rill erosion on un-vegetated cut slopes is delivering sediment to the pond. Embankment is in good condition.	Stream flow, surface runoff
PA063	Moderate condition. Two nickpoints where gully erosion is occurring on the spillway (1.2 feet deep near the crest and 5 to 8 feet deep near the base of the spillway) will eventually compromise pond. Numerous California ground squirrel burrows are present in the embankment.	Surface runoff, shallow concentrated flow
PA064	Poor condition. The pond embankment may soon be compromised by a large 6.5-foot-deep gully (approximately 4 feet from the crest of the spillway) caused by erosion of the spillway. Cattle loafing is moderate under trees adjacent to the pond.	Seep, stream flow
PA065	Poor condition. The embankment contains a 7-foot-wide-by-5-foot-deep gully.	Surface runoff
PA066	Excellent condition. Numerous California ground squirrel burrows are present in embankment. New culverts recently installed for pond outlet.	Stream flow, surface runoff
PA067	Good condition. Inlet gully/drainage contains some old channel erosion but is not actively eroding. Spillway is in good condition; it contains one small nickpoint, 1 foot by 2 feet by 3 feet long, that is not threatening the pond at this time.	Stream flow, surface runoff, small seep in the drainage
PA068	Moderate condition. Sediment loading is occurring from adjacent road. Headcut on spillway is about 30 feet from pipe outlet, about 3 feet deep. Two sequential headcuts are present, each about 3 feet high. Needs to be armored and rebuilt, but not very high risk.	Stream flow, surface runoff
PA069	Good condition. Pond was observed from a distance. Located in a former landslide slump. Does not appear to hold much water.	Seep, surface runoff
PA070	Excellent condition. Shallow. Spillway is *highly* eroded and very deeply downcut, up to 20 feet to bottom.	Stream flow, surface runoff

Table 5 2012-2015 Pond Assessment Results for San Antonio Creek (GU-17)

Pond ID	Pond Condition	Water Source
PA071	Excellent condition. A small slump above and adjacent to the pond and a few nickpoints upstream of the pond are depositing some sediment.	Seep, shallow concentrated flow, surface runoff
PA072	Good condition. The spillway is fully vegetated and appears to rarely overflow. No signs of erosion are present, beyond cattle impacts.	Surface runoff
PA073	Good condition. There is evidence of old erosion (slumps) on the south side of the pond. Nickpoint gully erosion is present on the spillway (1.6 feet deep by 5 feet wide by 25 to 30 feet long) but is growing in with grasses.	Shallow concentrated flow, surface runoff
PA074	Excellent condition. Many California ground squirrel burrows are present in the embankment. New culverts have been installed at the pond outlet.	Seep
PA075	Moderate condition. Spillway has a few small nickpoints eroded 1 to 2 feet deep at the downstream end. The ground is heavily disturbed and weedy.	Shallow concentrated flow, surface runoff
PA076	Good condition. The spillway is non-functional due to a low point on the embankment that infrequently spills. Erosional headcuts have developed where water has spilled over the embankment (2 to 3 feet deep by 2.5 feet wide by 2.5 to 5 feet long).	Shallow concentrated flow, surface runoff
PA085	Excellent condition. Banks are intact and well vegetated. Pond does not appear to overflow very often; however, significant gully erosion occurs from the spillway down to the stream channel.	Stream flow, shallow concentrated flow, surface runoff
PA130	Good condition. Pond is newly re-constructed, although erosion of new spillway is occurring. A lot of rill erosion from adjacent slope grading that has not fully re-vegetated is depositing sediment in the pond.	Stream flow, surface runoff
PA131	Moderate condition. Pond is full of sediment. Pond was constructed as a sediment pond for Courthouse Pond.	Stream flow, surface runoff
PA168	Excellent condition. Embankment has no California ground squirrel burrows or erosion, and spillway is hardly used.	Seep
PA173	Moderate condition. Numerous California ground squirrel burrows are present in the pond embankment. The northwest end of the embankment has gully erosion.	Surface runoff
PA174	Moderate condition. The pond has a lot of gully erosion below the spillway down to the stream channel with three separate headcuts 1.5 to 16 feet deep and over 30 feet long. The pond outlet elevation is controlled by a 6-foot-diameter manhole pipe and 18-inch concrete pipe.	Shallow concentrated flow, surface runoff

Table 5 2012-2015 Pond Assessment Results for San Antonio Creek (GU-17)

Pond ID	Pond Condition	Water Source
PA175	Excellent condition.	Seep, shallow concentrated flow, surface runoff
PA176	Poor condition. The embankment is completely eroded down (approximately 8 feet) to the bottom of the former pond.	Shallow concentrated flow, seep in the swale upstream, surface runoff
PA185	Good condition. This is a small shallow excavated pond, but it has no erosion (relatively flat bench).	Seep
PA186	Good condition. Lots of sediment is coming into pond from two points on Ranch Road (especially the northwest side). Pond discharges through a 24-inch metal culvert into San Antonio Reservoir.	Stream flow, shallow concentrated flow, surface runoff
PA227	Good condition.	Shallow concentrated flow, sheet flow
PA228	Good condition. This is a shallow vernal pool associated with an old landslide.	Sheet flow
PA230	Good condition. This is a vernal pool associated with an old landslide.	Sheet flow
PA231	Poor condition. The pond embankment has failed, and the pond does not hold water.	Sheet flow, seep (spring)
PA232	Poor condition. The pond is filled with sediment and embankment failed. The pond no longer holds water.	Stream flow, sheet flow
PA233	Poor condition. Pond structure is intact but appears not to hold water due to pervious soil conditions.	Shallow concentrated flow from nearby road, sheet flow
PA234	Poor condition. Shallow pond does not hold water very long due to pervious soils.	Shallow concentrated flow, sheet flow
PA235	Poor condition. Shallow pond does not hold water very long due to pervious soils.	Sheet flow
PA236	Poor condition. Embankment has failed due to cattle trampling. Pond does not hold water.	Stream flow

ID = identification

Recommendations – Anticipated repairs are planned for six ponds within the grazing unit: PA076, PA066, PA064, PA130, PA068, and PA063. PA017 has been assessed and improvements are recommended for the spillway.

Potential approaches to improve cattle water availability across the lease include:

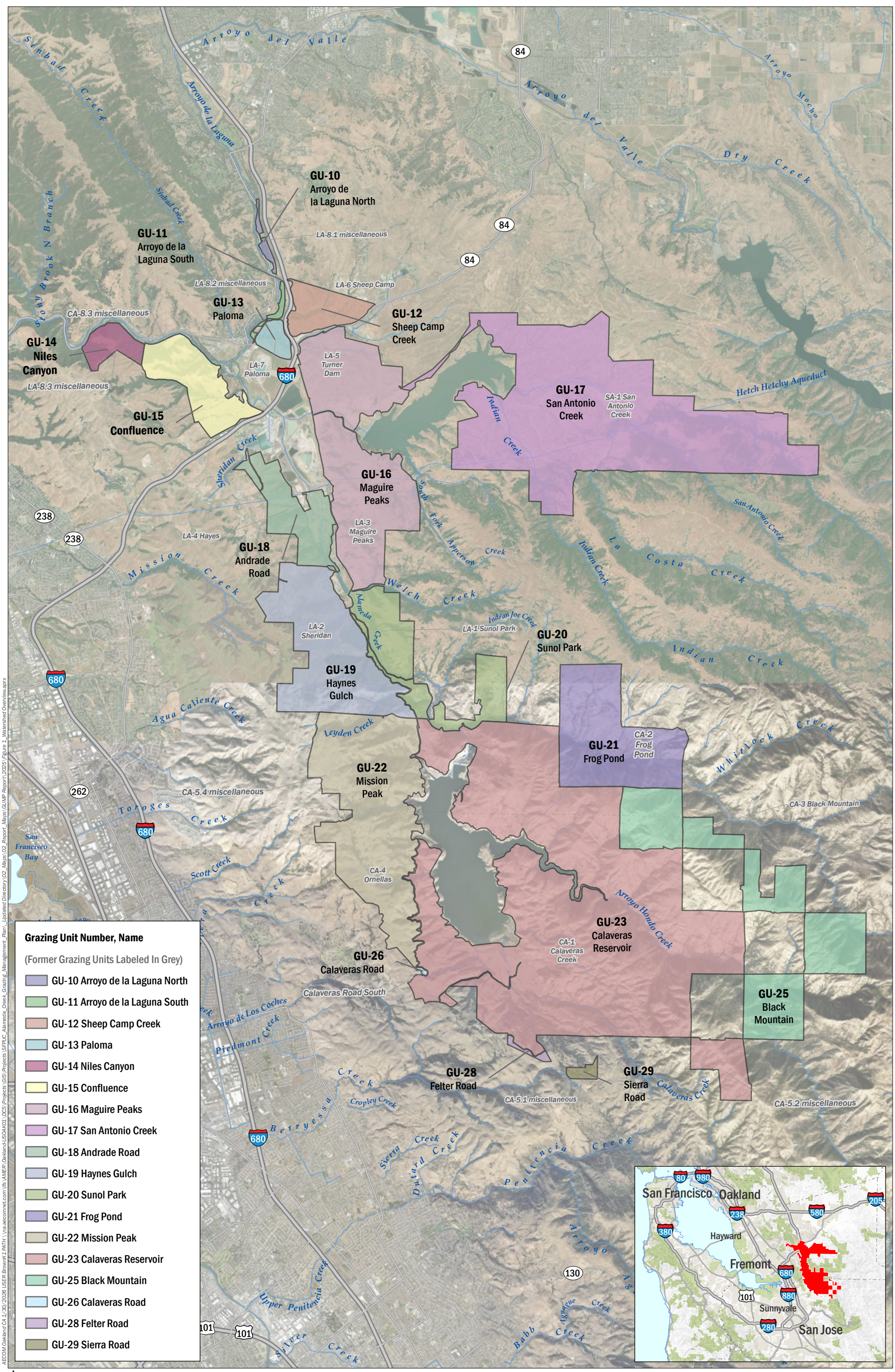
- Reconstruction of existing failed or failing ponds to restore or enhance the storage capacity;

- Repair of existing failed or failing spring water infrastructure or installation of new spring boxes and troughs where undeveloped water sources are available and are relatively reliable; and
- Installation of groundwater collection systems, tank(s), and troughs in appropriate drainages, landslides, or hillslopes with high soil moisture.

5. Grazing Unit Management

This GUMP outlines the existing conditions and management goals for the lease to guide the long-term rangeland management of the grazing unit. Annual monitoring, inspections, and tenant meetings will be used to adapt the management based on seasonal variation and rangeland health. The SFPUC will conduct annual inspections of each grazing unit to evaluate infrastructure condition, rangeland health, and biological considerations relative to the goals of the RMP. In addition, the SFPUC will conduct rangeland monitoring, including periodic composition monitoring and RDM monitoring in specified plots. The annual inspection and monitoring data will be summarized to share with the tenant and inform the Annual Operating Plan.

Each year, the SFPUC Rangeland Management Team will meet with the tenant to review the rangeland condition, document issues, and discuss goals for the grazing unit. The Rangeland Management Team includes the Rangeland Manager, the Watershed Resources Manager, the Senior Integrated Pest Management Specialist, the Senior Biologist, and the Watershed Forester. Based on this discussion, the SFPUC will develop an Annual Operating Plan that outlines specific management objectives for the following year. The Annual Operating Plan will document current monitoring and rangeland assessment data, outline stocking rates based on forage production and rangeland condition, and summarize annual management objectives for grazing infrastructure improvements, Managed Riparian Areas, NNIP management, and environmental stewardship. The SFPUC will prioritize investments in infrastructure and operations based the RMP goals and conditions in the grazing units across the watershed.



AECOM Oakland CA 1/30/2026 USER BrownK1.PATH \\na.aecomnet.com\fs\AMER\Oakland-USOAK01\DCS\Projects\GIS\Projects\SFPUC_Alameda_Creek_Grazing_Management_Plan_Updated Directory\02_Maps\02_Report_Maps\GUMP Report\2025\Figure 1_Watershed Overview.aprx

San Francisco Water Power Sewer

AECOM

Figure 1: SFPUC Alameda Creek Watershed Grazing Unit Overview

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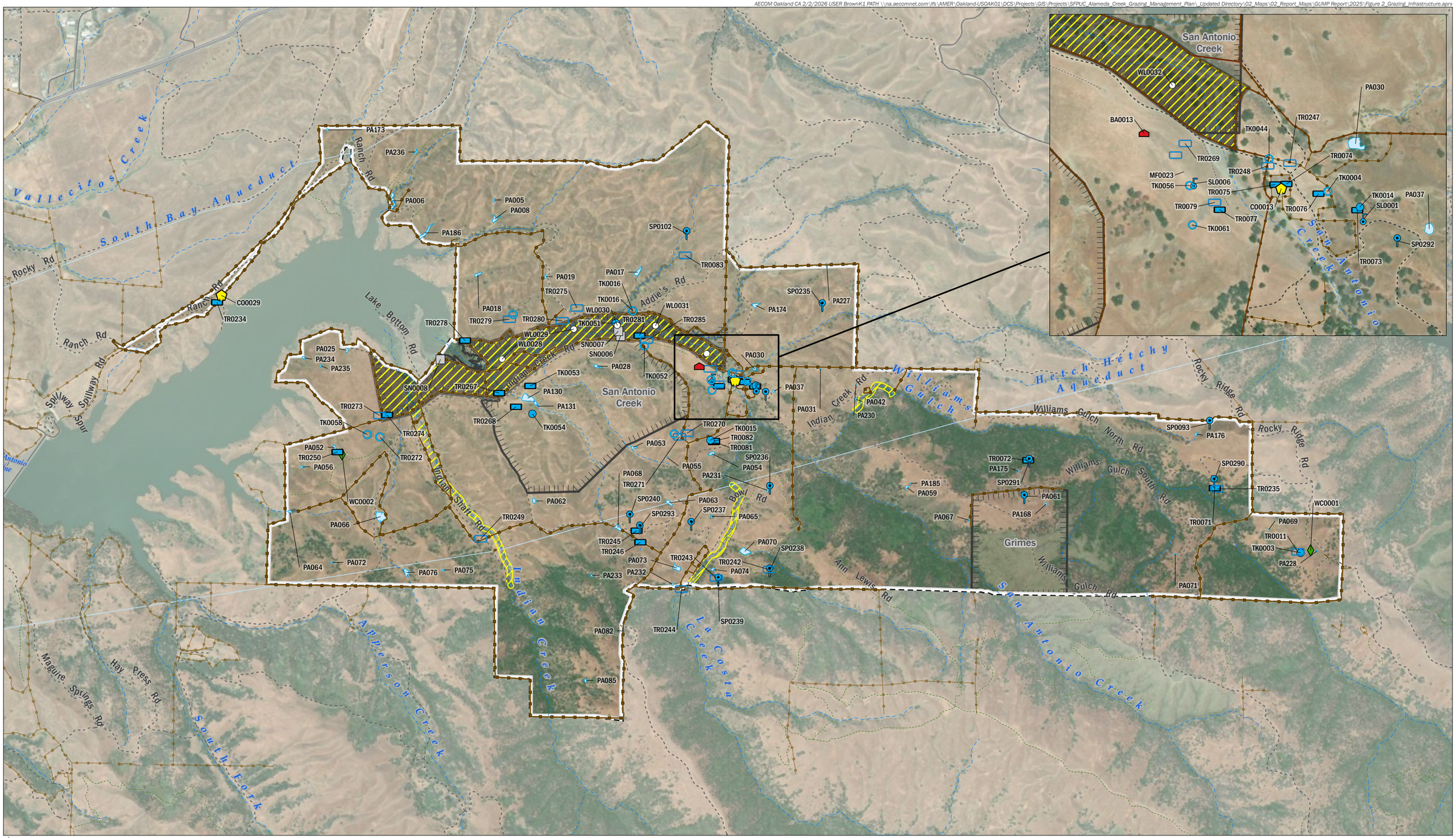

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Feet

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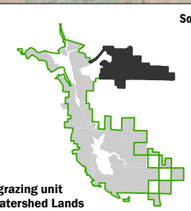
- SFPUC Grazing Unit Boundary
- BHR Conservation Easement
- BHR Exclusion Area
- Managed Riparian Area
- Fence
- Unpaved road
- Trail
- Aqueduct
- Intermittent stream
- Pond

Grazing Infrastructure

- Barn
- Corral
- Solar Panel
- Solar Pump
- Spring
- Tank (non-functioning or unknown)
- Tank (functioning)
- Trough (non-functioning or unknown)
- Trough (functioning)
- Water Treatment Equipment
- Well



Location of grazing unit within SFPUC Watershed Lands

Sources: AECOM, 2025; ESRI Imagery, 2025; SFPUC, 2025; Rangeland Conservation Science, 2025.

Hetch Hetchy Regional Water System
Services of the San Francisco Public Utilities Commission

Figure 2: GRAZING UNIT 17 SAN ANTONIO CREEK

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