

# Dam Maintenance Program

## Exhibit A Maintenance Plan

December 2022

*Prepared for:*

**City of San Diego**  
**Public Utilities Department**  
9192 Topaz Way, MS 901A  
San Diego, CA 92123

*Prepared by:*

**HELIX Environmental Planning, Inc.**  
7578 El Cajon Boulevard  
La Mesa, CA 91942

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## ACRONYMS AND ABBREVIATIONS

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BMP	Best Management Practice
CEQA	California Environmental Quality Act
CDFW	California Department of Fish and Wildlife
City	City of San Diego
CWA	Clean Water Act
DSD	Development Services Department (City of San Diego)
DSOD	Division of Safety of Dams (State of California)
MMRP	Mitigation and Monitoring Reporting Program
MND	Mitigated Negative Declaration
Plan Program	Maintenance Plan (for the Dam Maintenance Program) Dam Maintenance Program
PUD	Public Utilities Department (City of San Diego)
RWQCB	Regional Water Quality Control Board
SCR	Substantial Conformance Review
SDP	Site Development Permit
SR	State Route
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service

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# 1.0 INTRODUCTION

The City of San Diego (City) Public Utilities Department (PUD) owns and manages 13 dams, spillways, and other associated infrastructure, including the approximately 13-mile Dulzura Conduit, located throughout San Diego County as part of the region’s drinking water infrastructure (Figure 1, *Regional Location*). Each dam has a unique system of outlet works and spillway components to control the reservoir water levels and safely release water during severe storm events or impending dam failure. Associated dam infrastructure includes, but is not limited to, groins, toes, saddle dams, spillways and auxiliary spillways, training and parapet walls, outlet works, storm drain headwalls associated with the outlet works, and appurtenant structures. The City PUD is responsible for conducting maintenance and repair of these facilities.

The dams and associated infrastructure are subject to the regulatory jurisdiction of the Division of Safety of Dams (DSOD), which is part of the California Department of Water Resources, under Division 3 of the California Water Code. The DSOD oversees dam safety in California with the goal of avoiding dam failure, which could lead to potential loss of life and destruction of property. As part of the dam safety program, the DSOD completes detailed semi-annual inspections and provides an annual inspection report of the City’s dams to identify maintenance activities such as vegetation removal, grading, dredging, and repairs to infrastructure and may request certain maintenance work to be performed to improve dam safety.

The City PUD has developed the Dam Maintenance Program (Program) to provide a comprehensive approach to oversight and long-term routine maintenance of 13 of the City’s dams, Dulzura Conduit, and associated infrastructure. This Maintenance Plan (Plan) identifies specific activities, methods, and procedures that will guide ongoing maintenance and repair of these facilities under the Program, and covers the maintenance activities that are routinely included in the DSOD annual inspection reports.

## 1.1 PROGRAM BACKGROUND

Maintenance and repair of the City’s dams, Dulzura Conduit, and associated infrastructure has historically occurred on an as-needed basis. However, maintenance of certain facilities has been limited or deferred based on their location within environmentally sensitive lands, as defined in the City’s Municipal Code Environmentally Sensitive Land Regulations (Chapter 14, Article 3, Division 1), and aquatic resources subject to the regulatory jurisdiction of state and federal agencies. Deferred maintenance can interfere with dam and reservoir operations, affect the facility’s ability to perform as originally designed, hinder access to key infrastructure, and prevent DSOD from completing annual inspections. Furthermore, the lack of routine maintenance and repairs could result in the deterioration of critical City infrastructure, increases the risk of dam failure, and poses a risk to downstream properties and life.

The DSOD has recently mandated that the City complete specific maintenance activities at several of the dams. If a violation were to occur, the DSOD could potentially penalize an agency through monetary fines or other measures, such as restricting water levels at City’s reservoirs, impacting the City’s ability to provide reliable drinking water to the region. Recognizing the need for swift and ongoing maintenance, the City PUD has developed this Program to cover the long-term maintenance of these facilities and comply with routine recommendations issued by the DSOD. As such, this Program has been designed to proactively address maintenance needs prior to DSOD inspections and on an as-needed

basis. It also provides the City oversight to address items in DSOD’s inspection reports to avoid potential violations.

## 1.2 PROGRAM OBJECTIVES

The following are the primary objectives of the Dam Maintenance Program:

- Provide for timely and consistent routine maintenance and repair of the City’s dams and associated infrastructure to prevent deterioration and maintain the integrity and functionality of critical infrastructure;
- To complete ongoing routine maintenance of the City’s dams and associated infrastructure to allow for semi-annual DSOD inspections;
- To complete ongoing routine maintenance and repairs to the City’s dam and associated infrastructure to meet dam safety standards and protect life and property adjacent to, downstream, and upstream of the dams from flooding and environmental degradation in the event of dam failure;
- Avoid, minimize, and/or mitigate significant adverse environmental effects resulting from routine maintenance and repair of the City’s dams and associated infrastructure;
- Ensure implementation of Best Management Practices (BMPs) and maintenance protocols during maintenance activities to avoid and/or minimize potential impacts to sensitive environmental resources;
- Provide project-level analysis of the Dam Maintenance Program that will facilitate authorizations from local, state, and federal regulatory agencies; and
- Identify a review-and-approval process to include additional maintenance activities that may be required that follow the protocols and requirements of the Dam Maintenance Program.

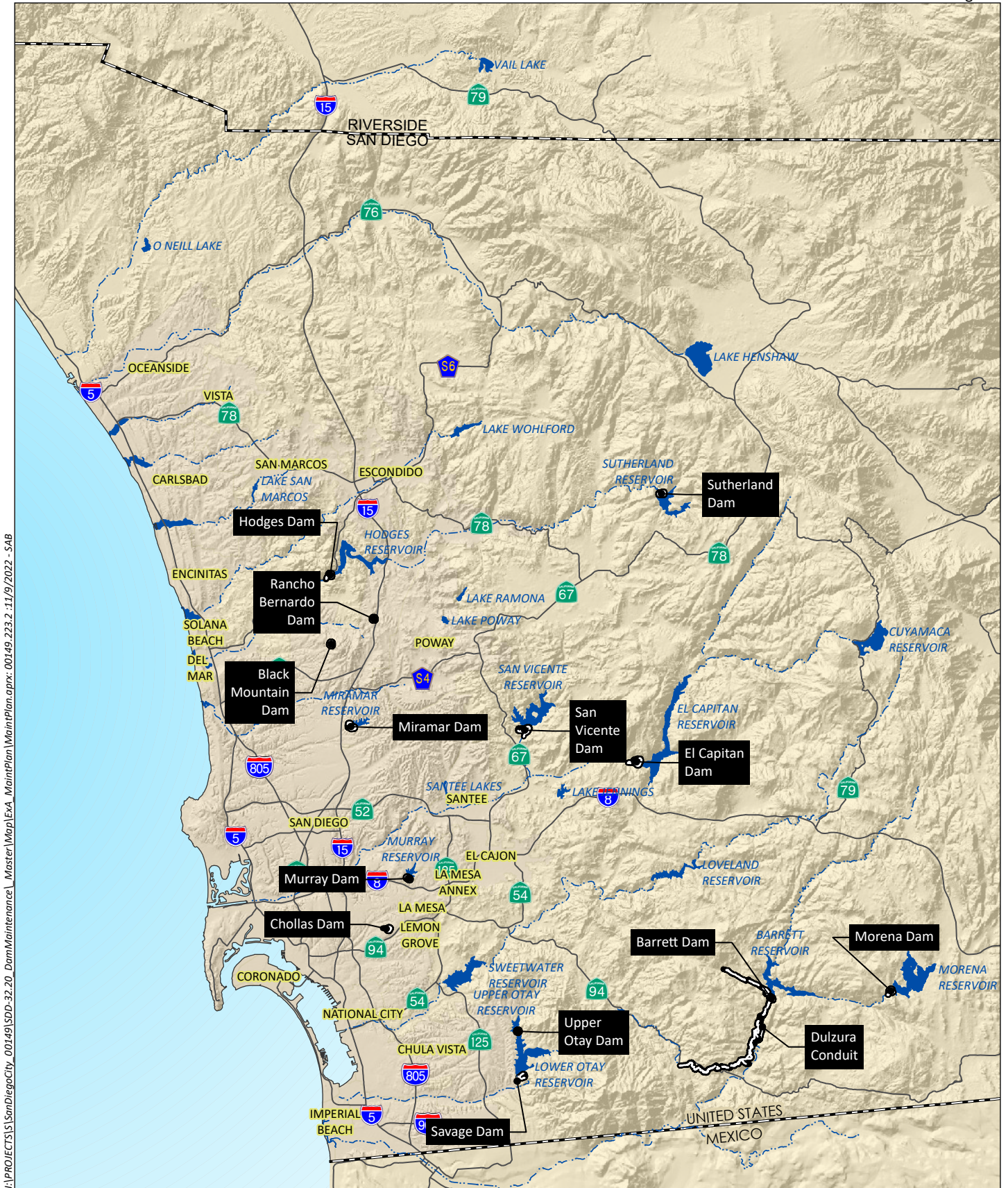
## 1.3 PROGRAM LOCATION AND FACILITIES

This Program includes routine maintenance of 13 City dams and associated infrastructure, including the approximately 13-mile Dulzura Conduit, located throughout San Diego County, California (Figure 1). A detailed description of each location, including a summary of existing facilities, is provided below.

### 1.3.1 Barrett Dam

Barrett Dam is located in the eastern portion of the County, in the unincorporated community of Dulzura. Barrett Dam is located at the outlet of Barrett Reservoir along Barrett Lake Road, north of Campo Road (State Route [SR] 94), south of Skye Valley Road, east of Lyons Valley Road, and west of Horizon View Drive. The access road is located southeast of Lyons Valley Road, south and west of Barrett Lake, and north of SR 94. The Barrett Dam maintenance area encompasses the dam and associated infrastructure (i.e., outlet tower, tower outlet tunnel boat ramp, discharge paths, etc.), including access roads to the north and south of the dam (Figures 2a-1 to 2a-3, *Existing Facilities and Maintenance Footprint/Limits of Work – Barrett Dam*).

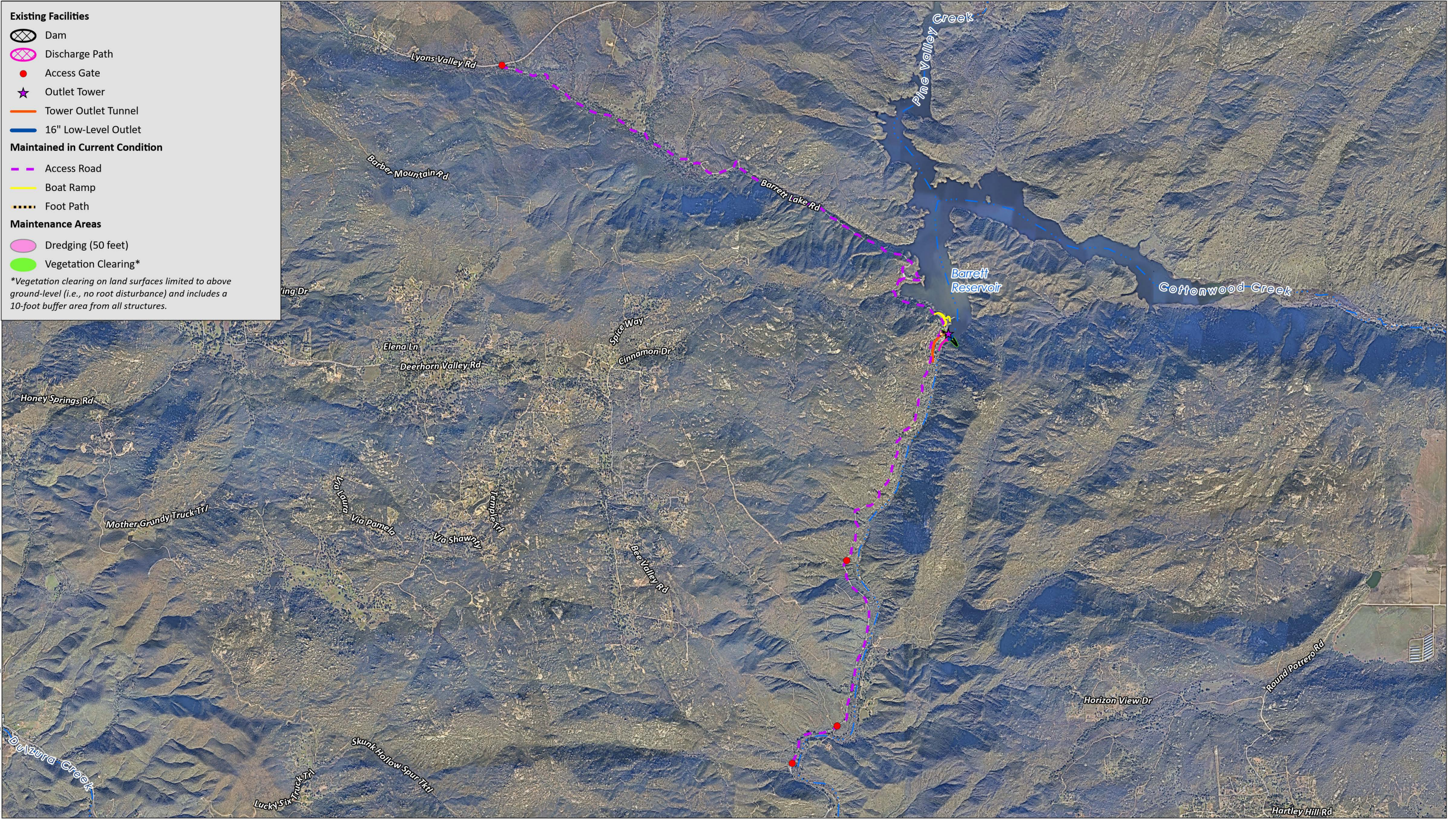




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Source: Base Map Layers (SanGIS, 2016)

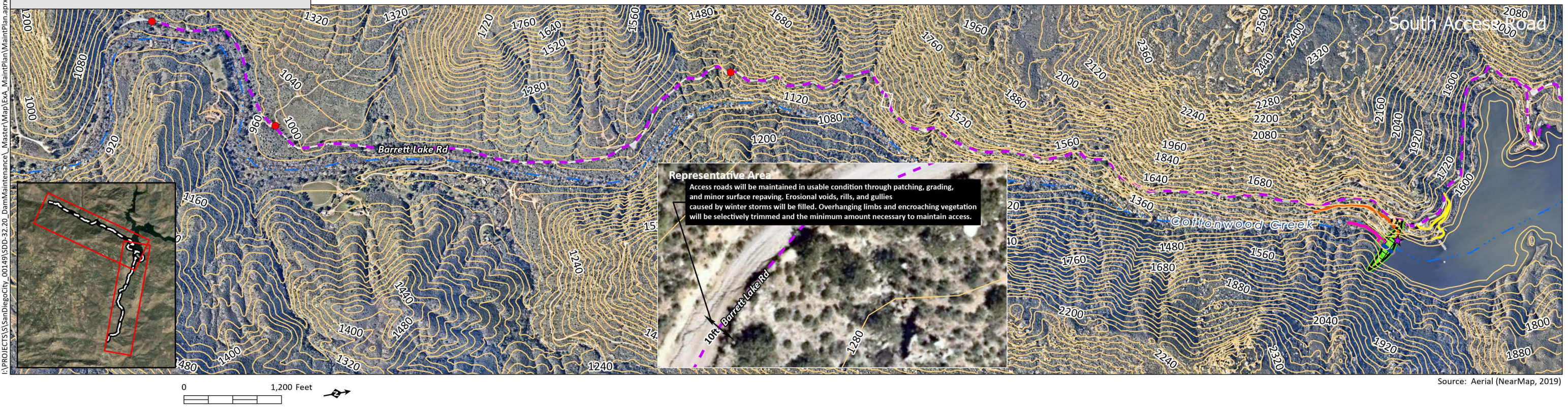
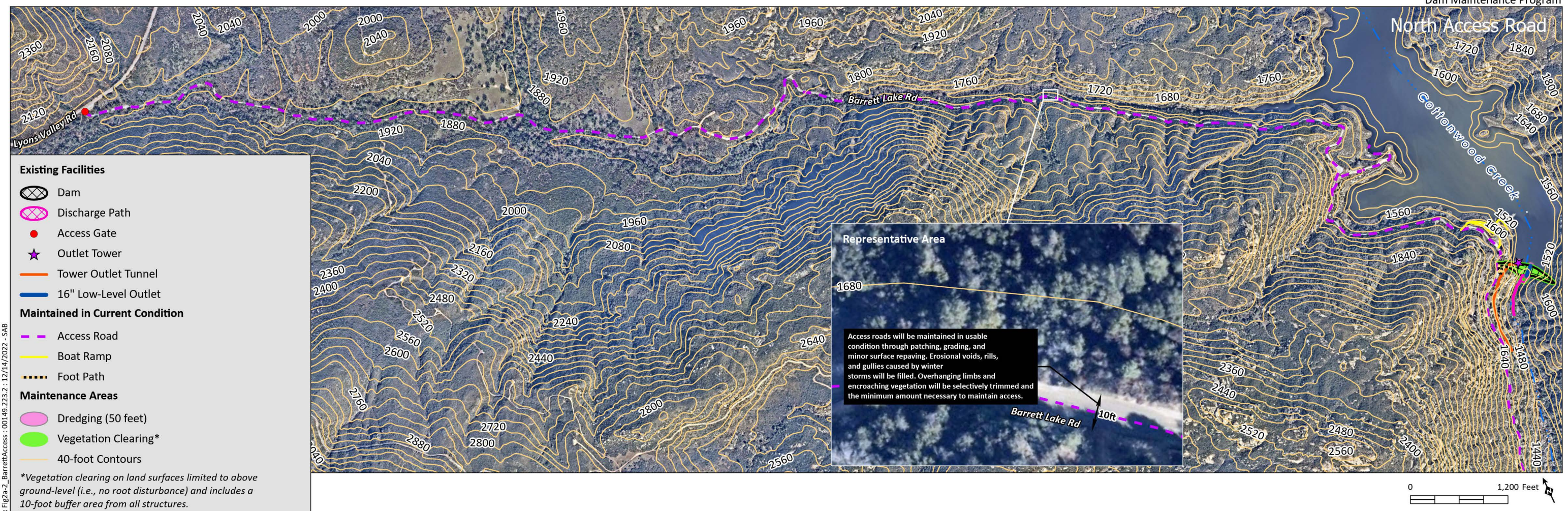




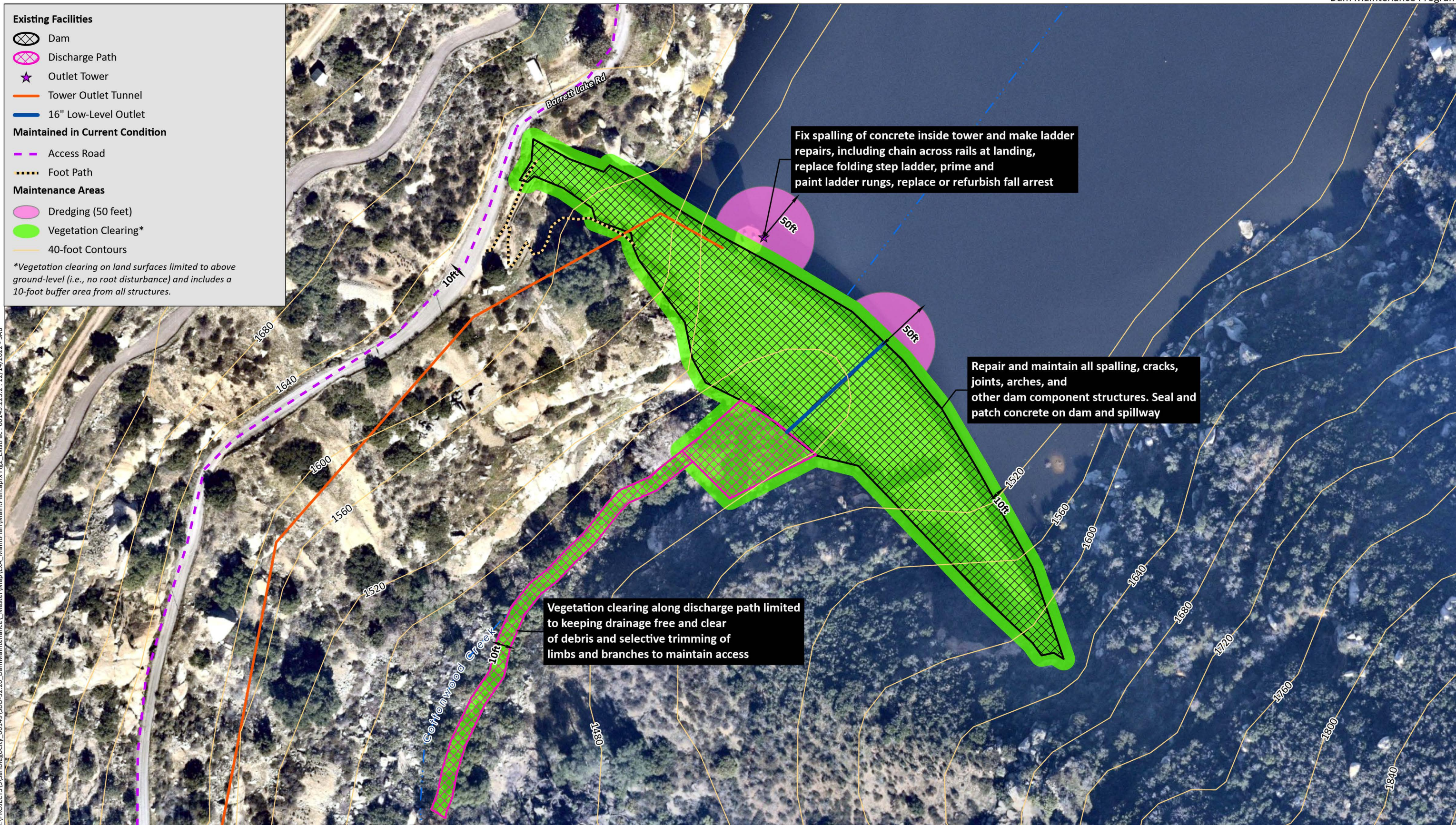
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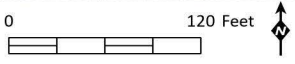








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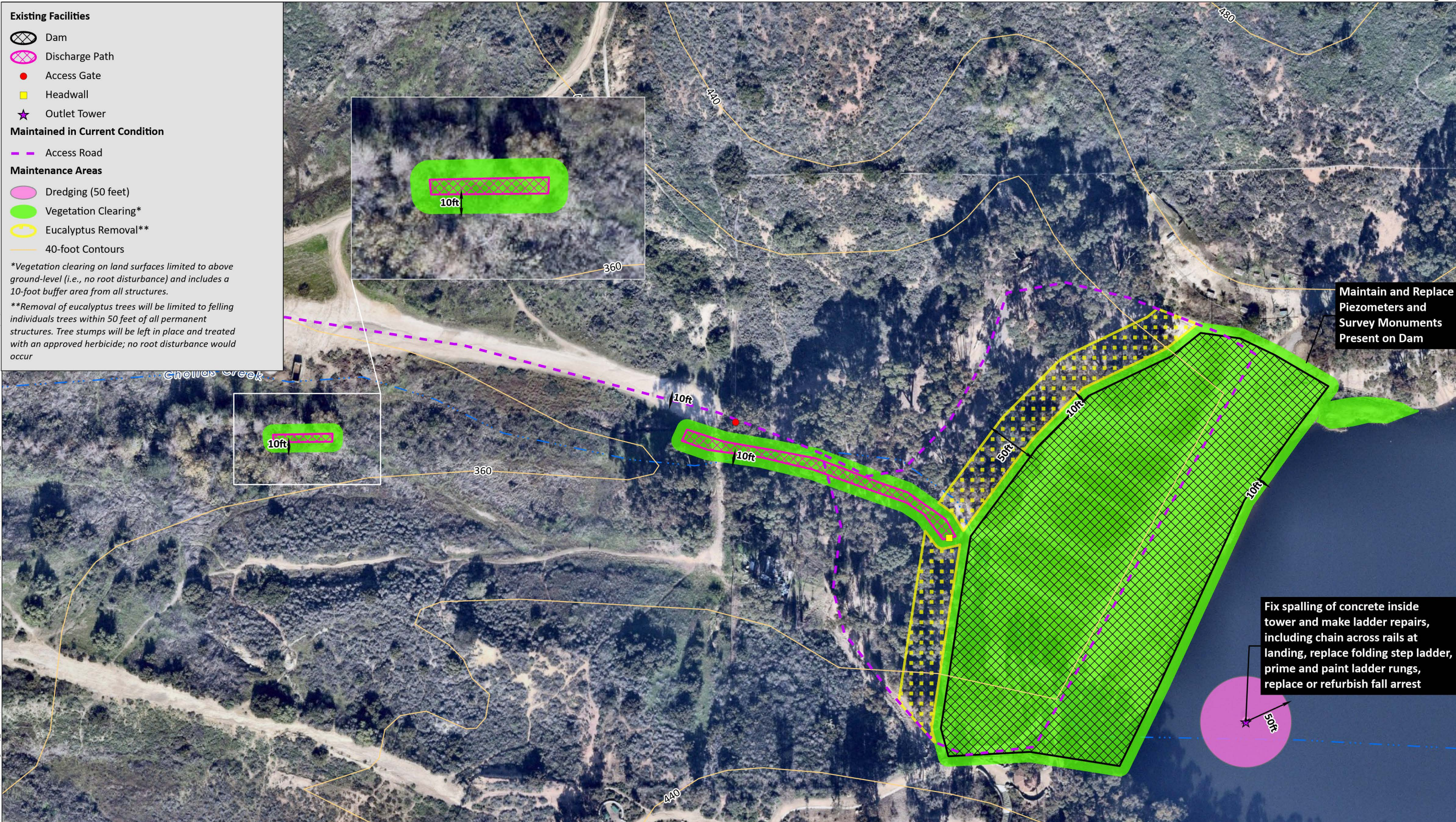


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Source: Aerial (NearMap, 2019)



El Capitan Spillway Vegetation Removal Project

**Existing Facilities**

- Dam
- Spillway
- Lower Spillway
- Spillway Channel
- Discharge Path
- Materials Staging & Tool Shed
- Access Gate
- Blow-Off Valve
- Outlet Tower
- Weir

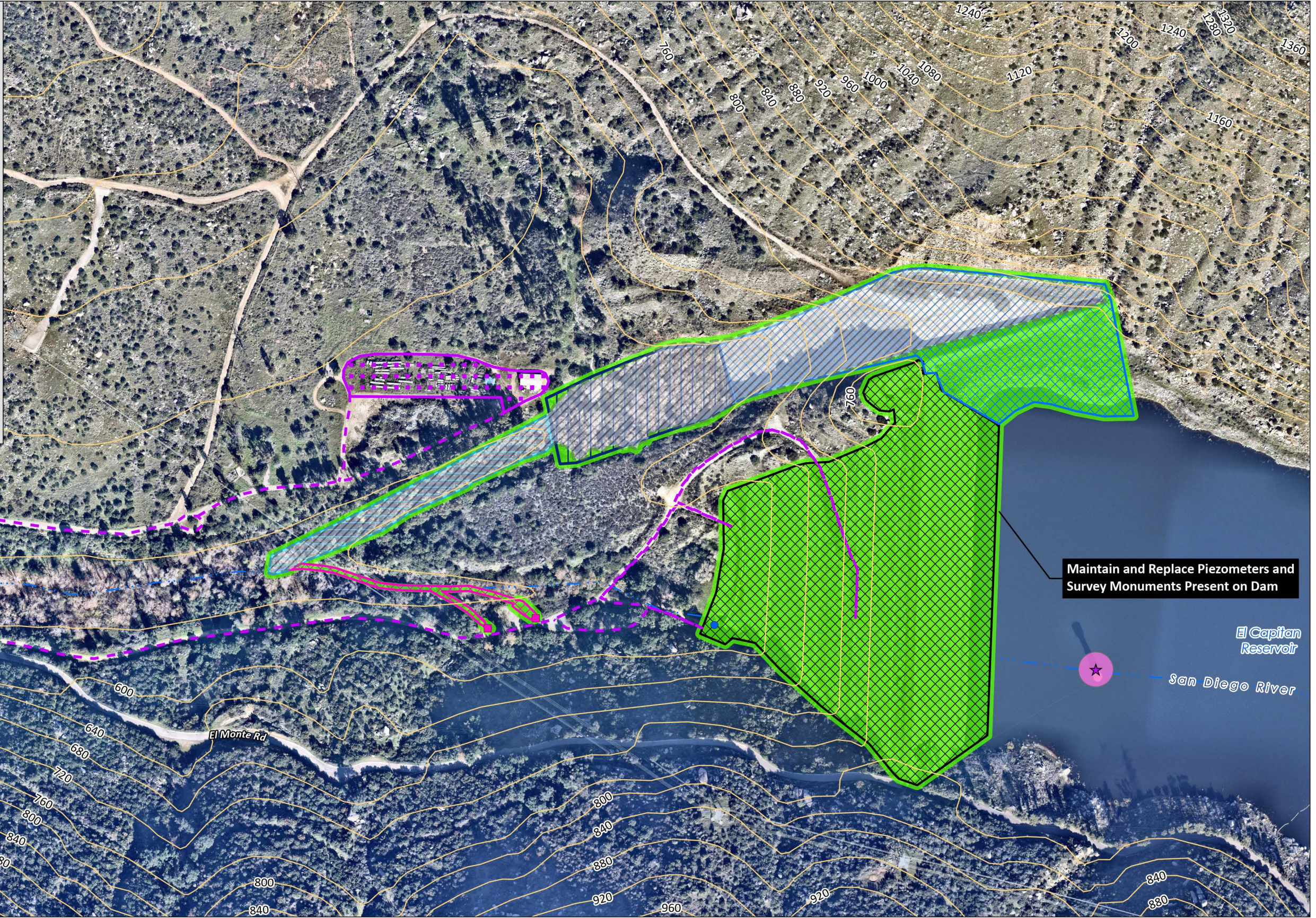
**Maintained in Current Condition**

- Access Road

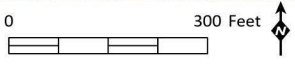
**Maintenance Areas**

- Dredging (50 feet)
- Vegetation Clearing\*
- 40-foot Contours

\*Vegetation clearing on land surfaces limited to above ground-level (i.e., no root disturbance) and includes a 10-foot buffer area from all structures.

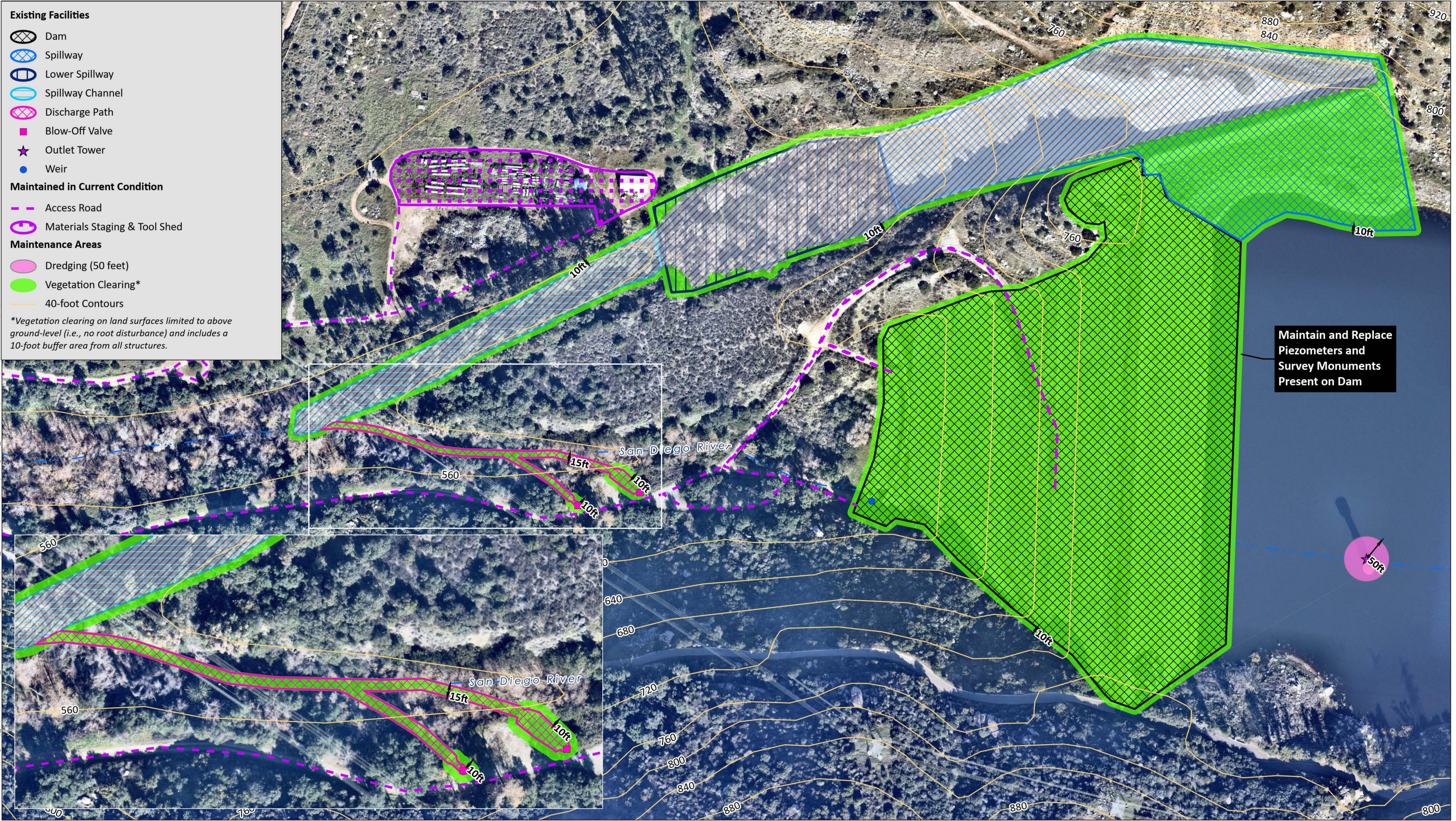


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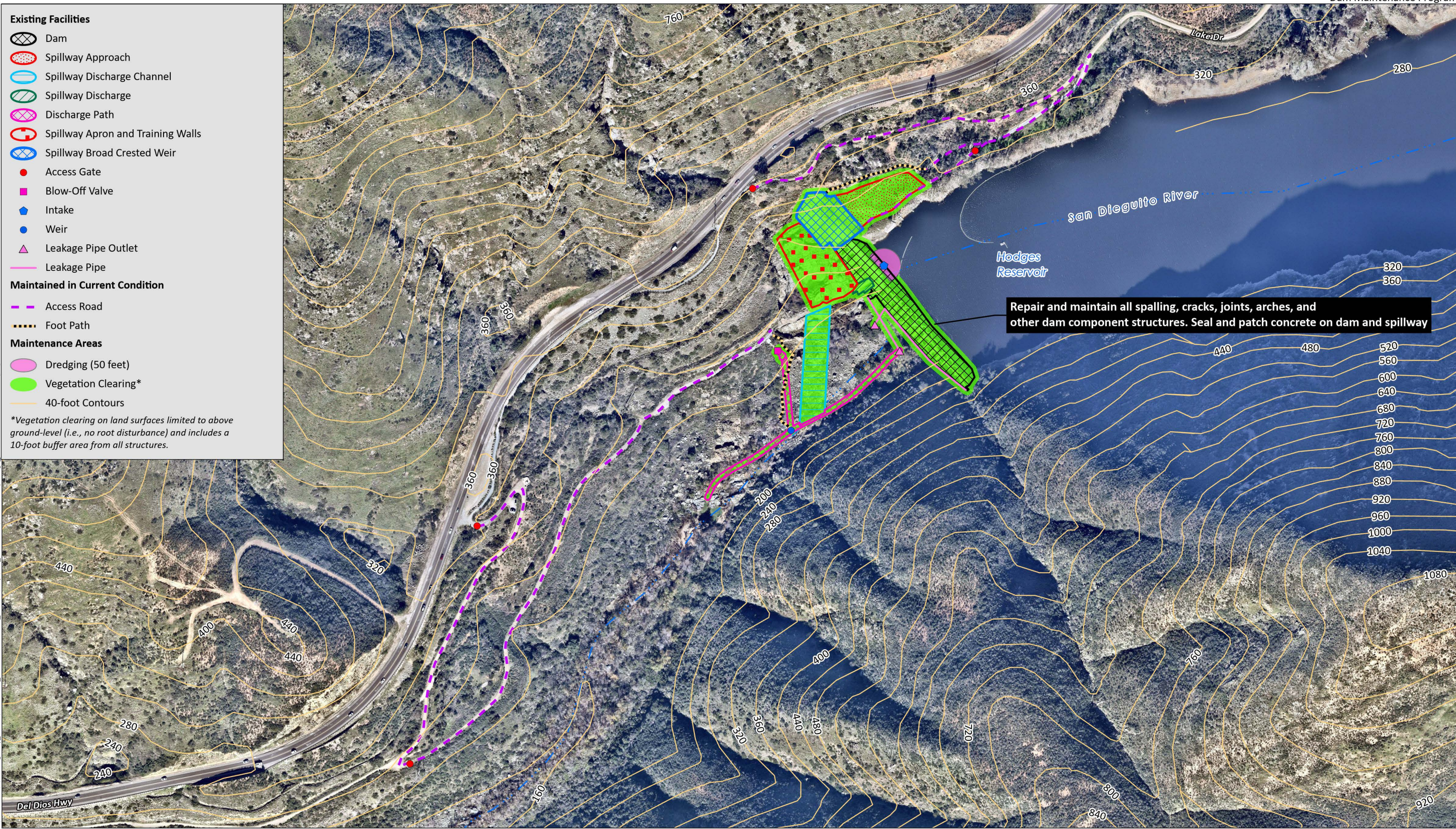
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Source: Aerial (NearMap, 2019)



**Existing Facilities**

- Dam
- Spillway Approach
- Spillway Discharge Channel
- Spillway Discharge
- Discharge Path
- Spillway Apron and Training Walls
- Spillway Broad Crested Weir
- Access Gate
- Blow-Off Valve
- Intake
- Weir
- Leakage Pipe Outlet
- Leakage Pipe

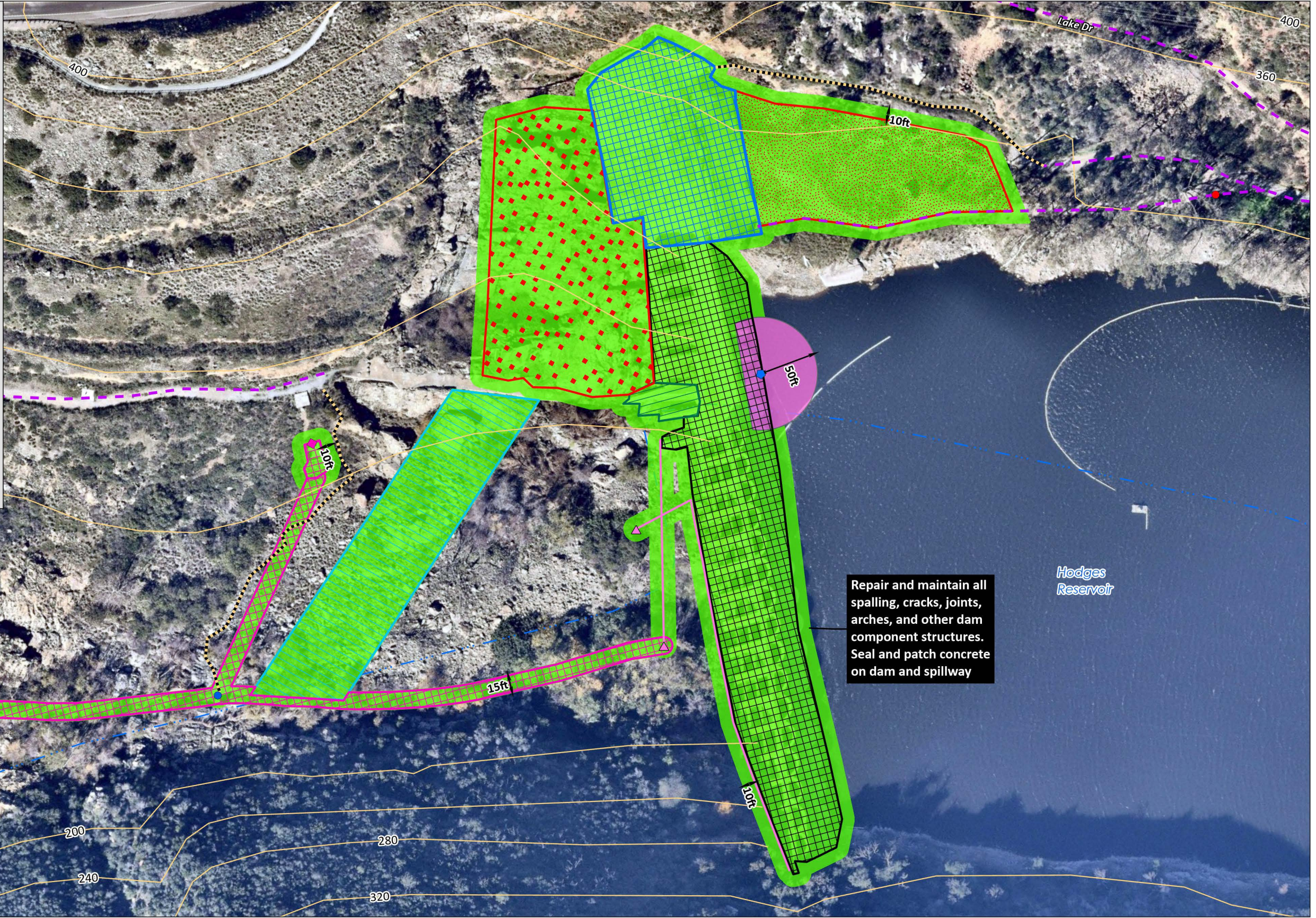
**Maintained in Current Condition**

- Access Road
- Foot Path

**Maintenance Areas**

- Dredging (50 feet)
- Vegetation Clearing\*
- 40-foot Contours

\*Vegetation clearing on land surfaces limited to above ground-level (i.e., no root disturbance) and includes a 10-foot buffer area from all structures.



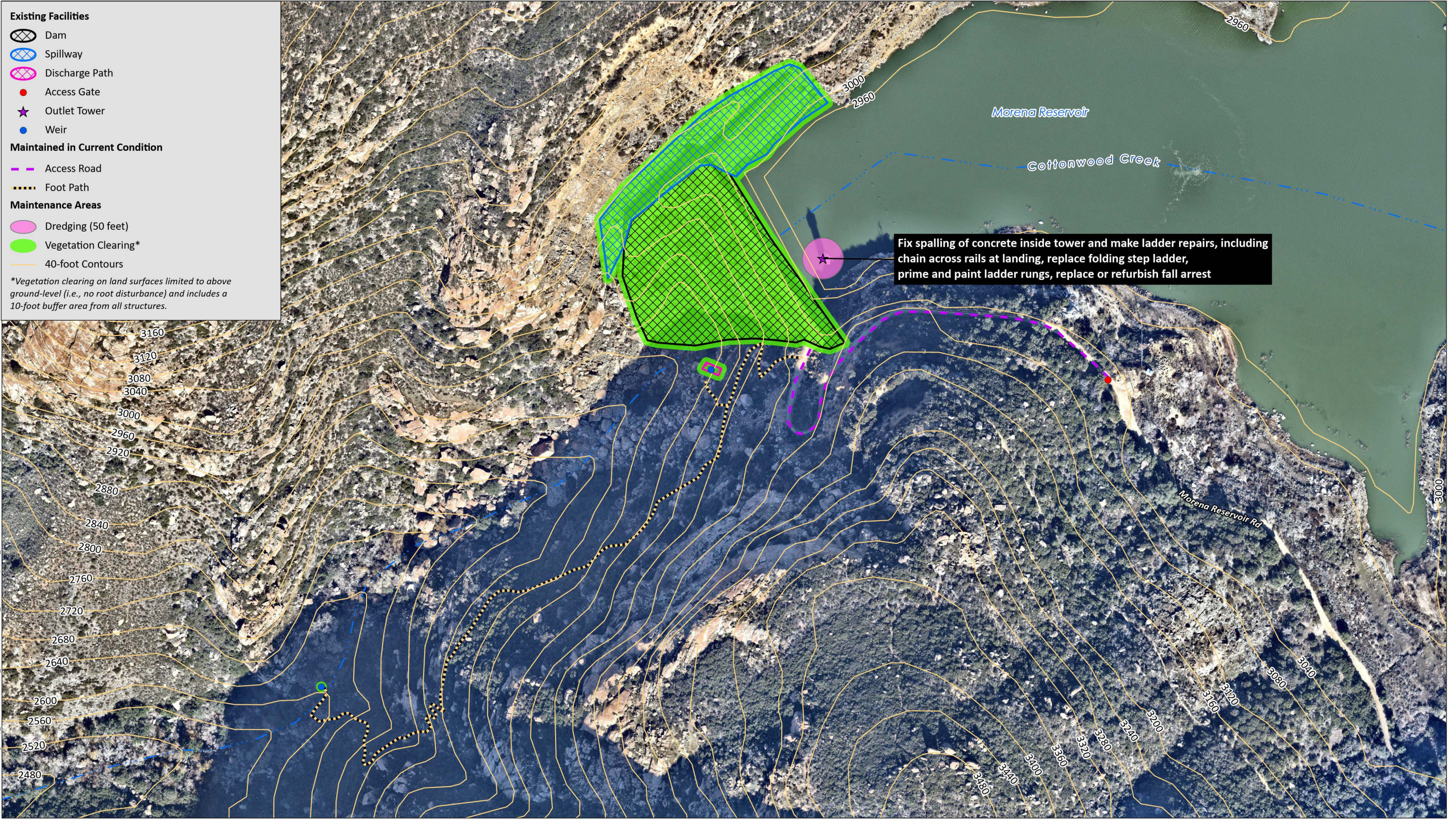
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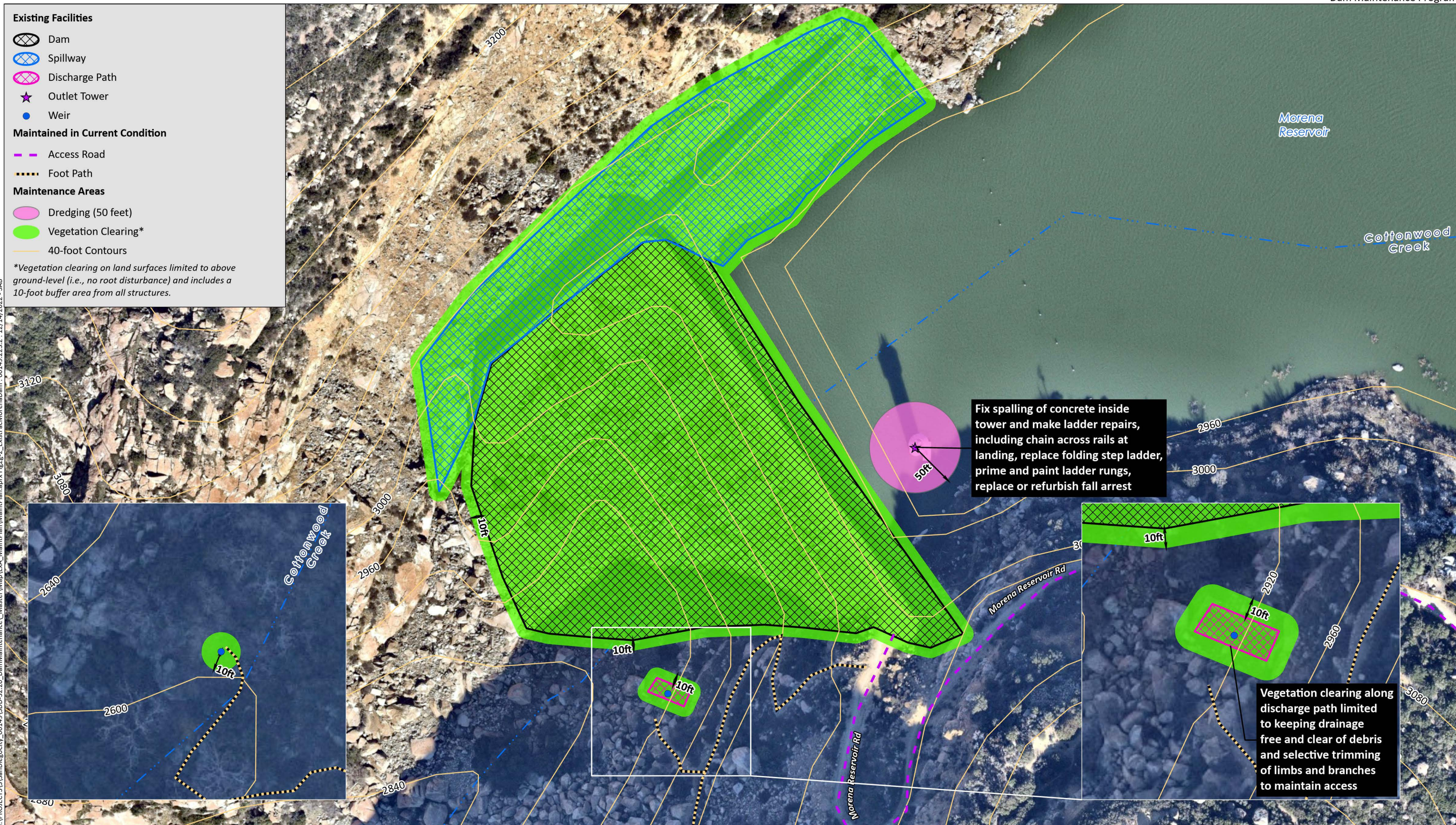


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Source: Aerial (NearMap, 2019)





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Source: Aerial (NearMap, 2019)

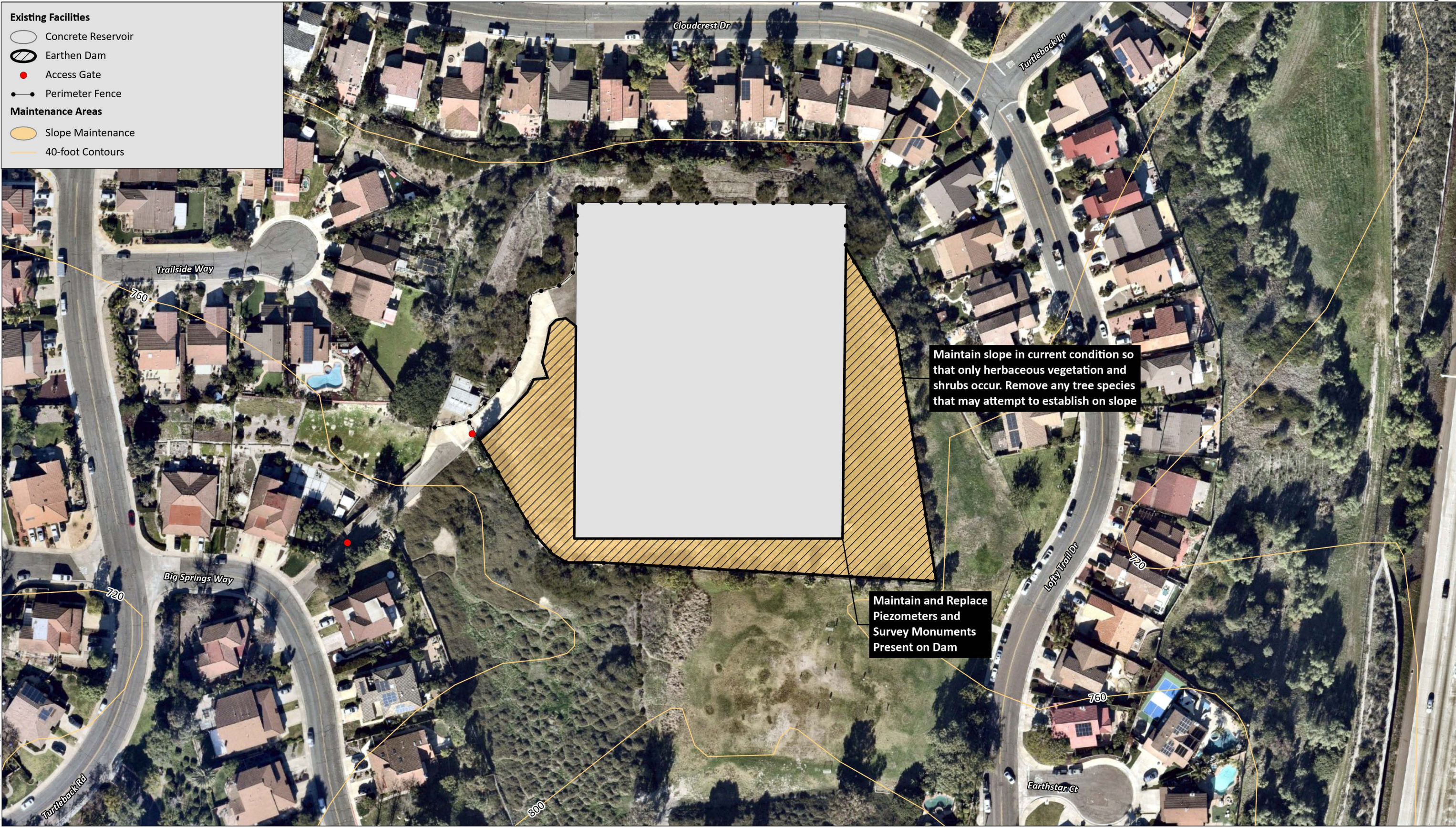




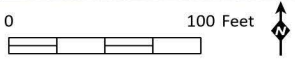


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Source: Aerial (NearMap, 2019)



**Existing Facilities**

- Concrete Pad
- Dam
- Saddle Dam
- Spillway
- Discharge Path
- Emergency Discharge Path
- Toe of Dam
- Wier Leakage Outlet
- Vehicle Turn-Around Area
- Emergency Discharge Control Facility
- Access Gate
- Intake
- Outlet Tower
- 3' Brow Ditch

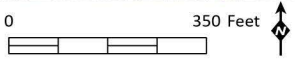
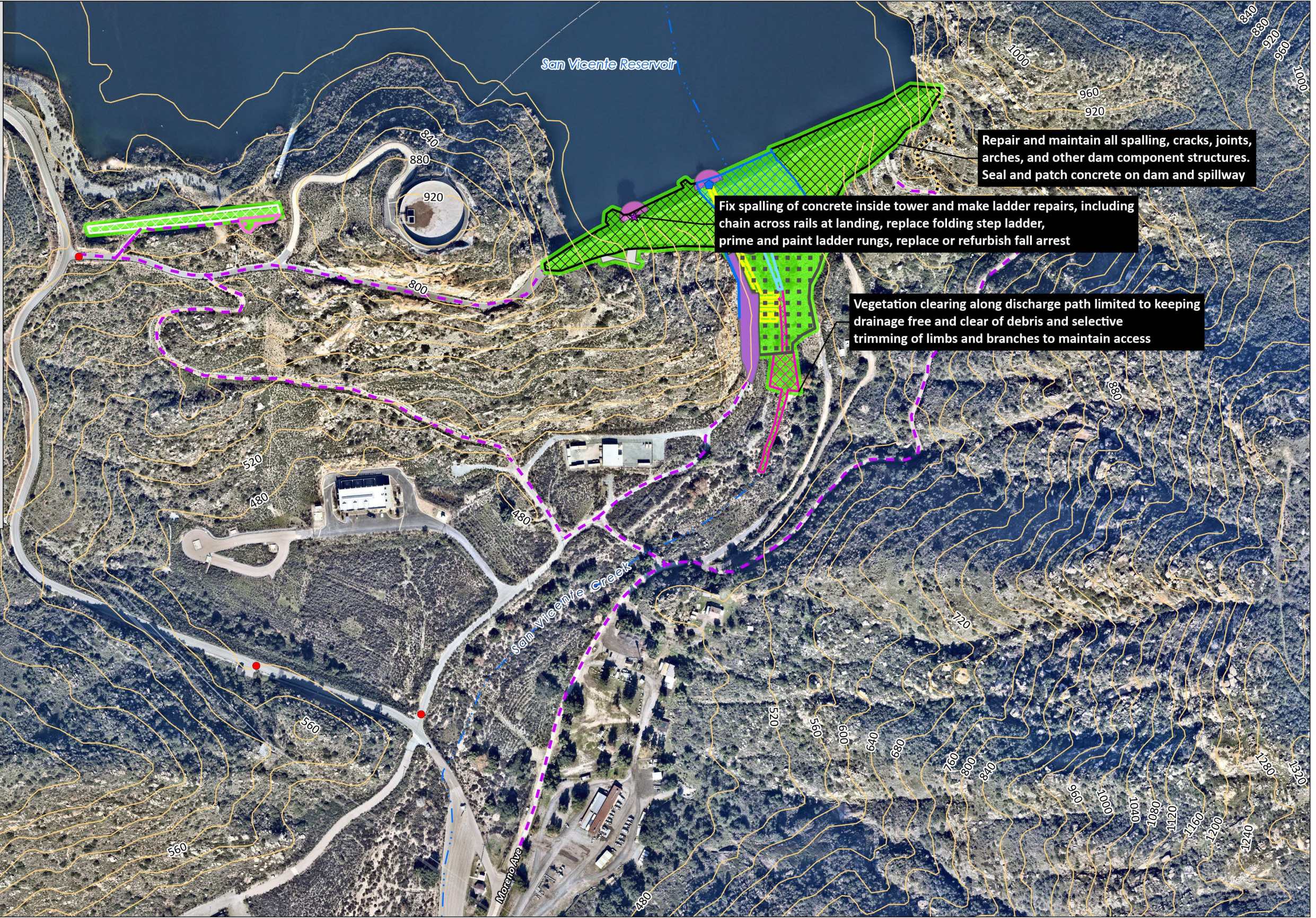
**Maintained in Current Condition**

- Access Road
- Foot Path

**Maintenance Areas**

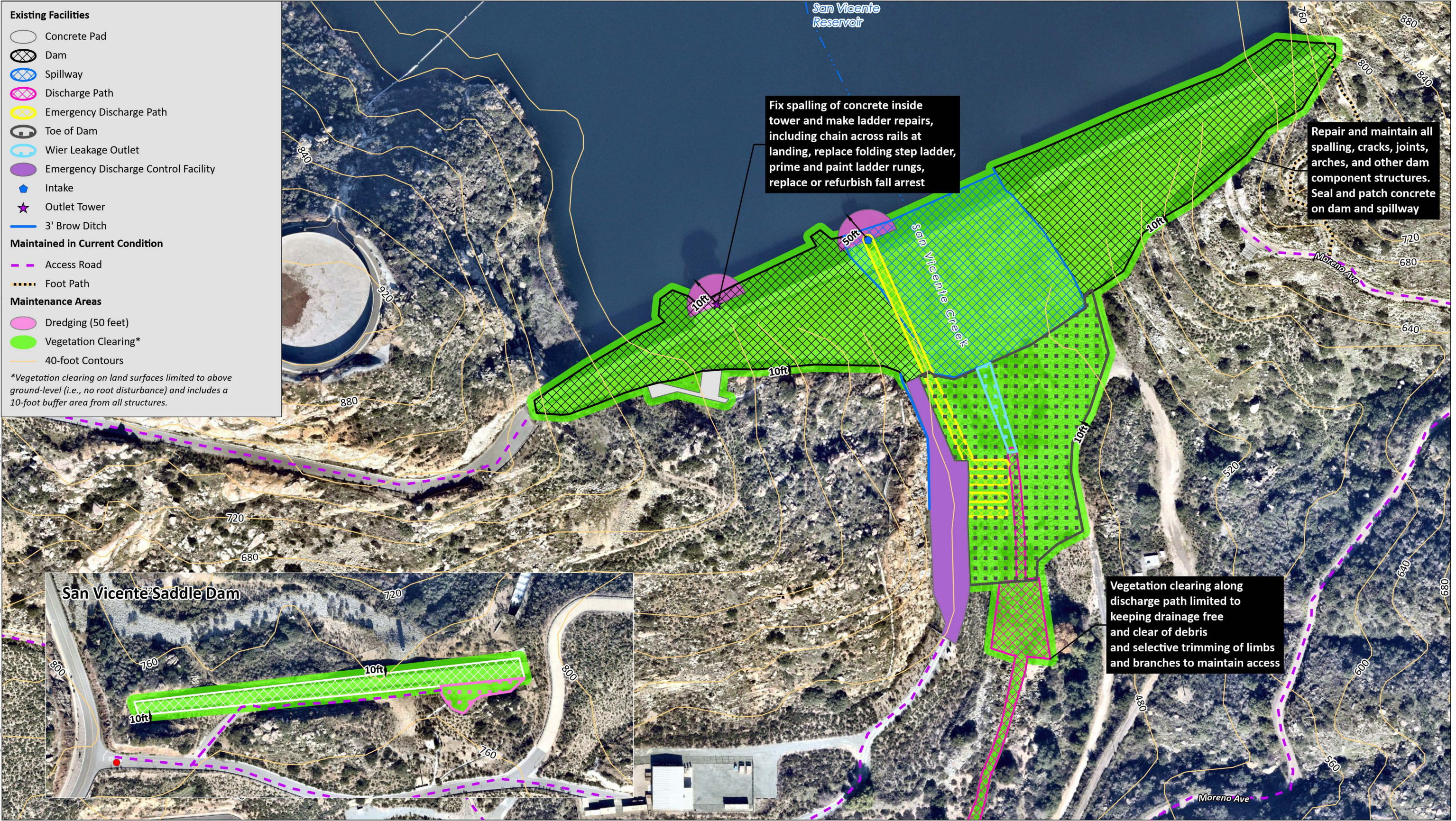
- Dredging (50 feet)
- Vegetation Clearing\*
- 40-foot Contours

\*Vegetation clearing on land surfaces limited to above ground-level (i.e., no root disturbance) and includes a 10-foot buffer area from all structures.



Source: Aerial (NearMap, 2019)





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- Existing Facilities**
- Dam
  - Spillway
  - Auxiliary Spillway
  - Discharge Path
  - Toe of Dam
  - Access Gate
  - Blow-Off Valve
  - Outlet Tower
  - Weir

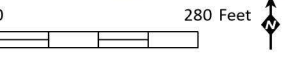
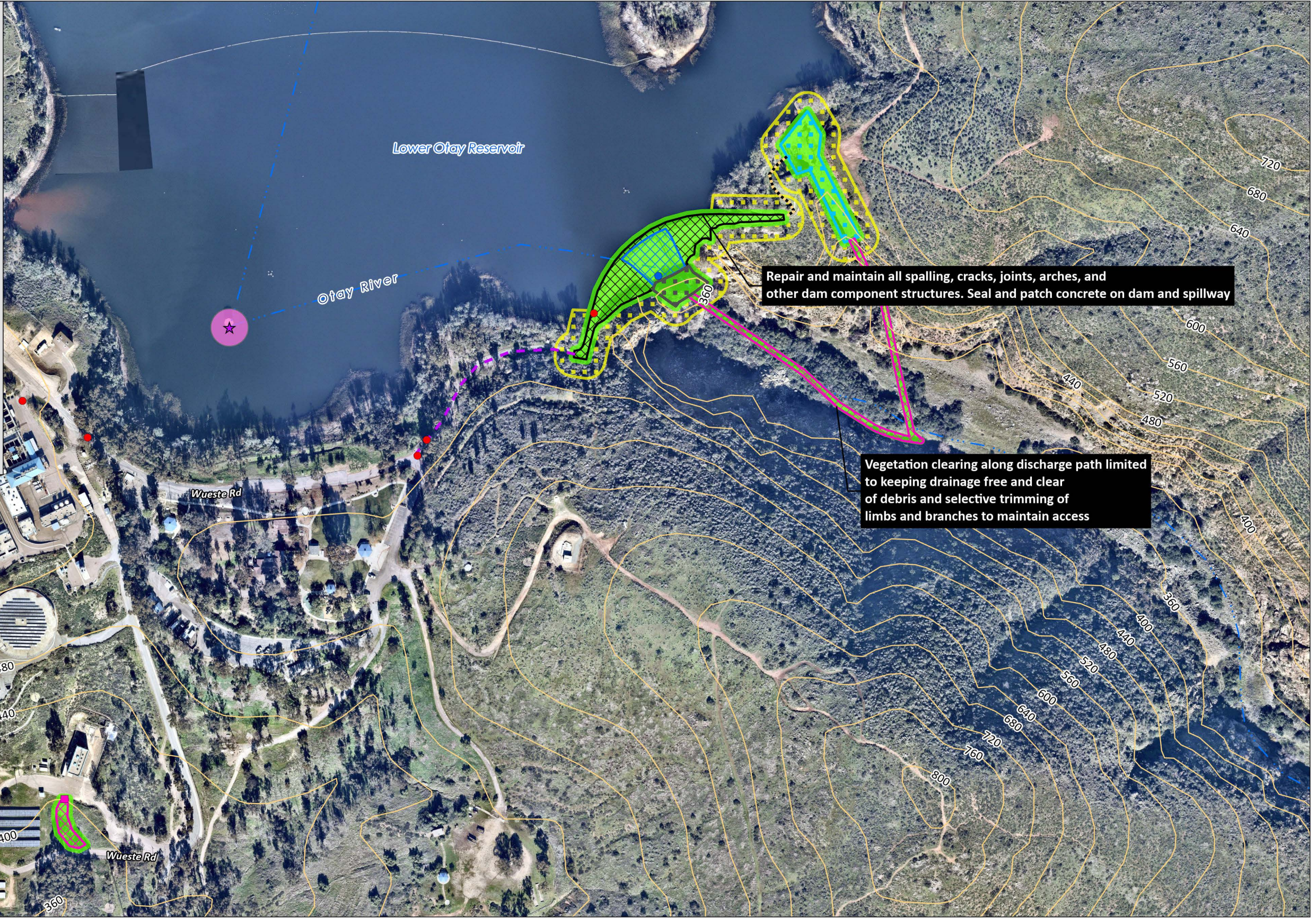
**Maintained in Current Condition**

- Access Road
- Foot Path

**Maintenance Areas**

- Dredging (50 feet)
- Vegetation Clearing\*
- Eucalyptus Removal\*\*
- 40-foot Contours

\*Vegetation clearing on land surfaces limited to above ground-level (i.e., no root disturbance) and includes a 10-foot buffer area from all structures.  
 \*\*Removal of eucalyptus trees includes a 50 foot buffer area from all structures.



Source: Aerial (NearMap, 2019)



**Existing Facilities**

- Dam
- Spillway
- Auxiliary Spillway
- Discharge Path
- Toe of Dam
- Access Gate
- Weir

**Maintained in Current Condition**

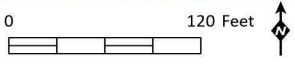
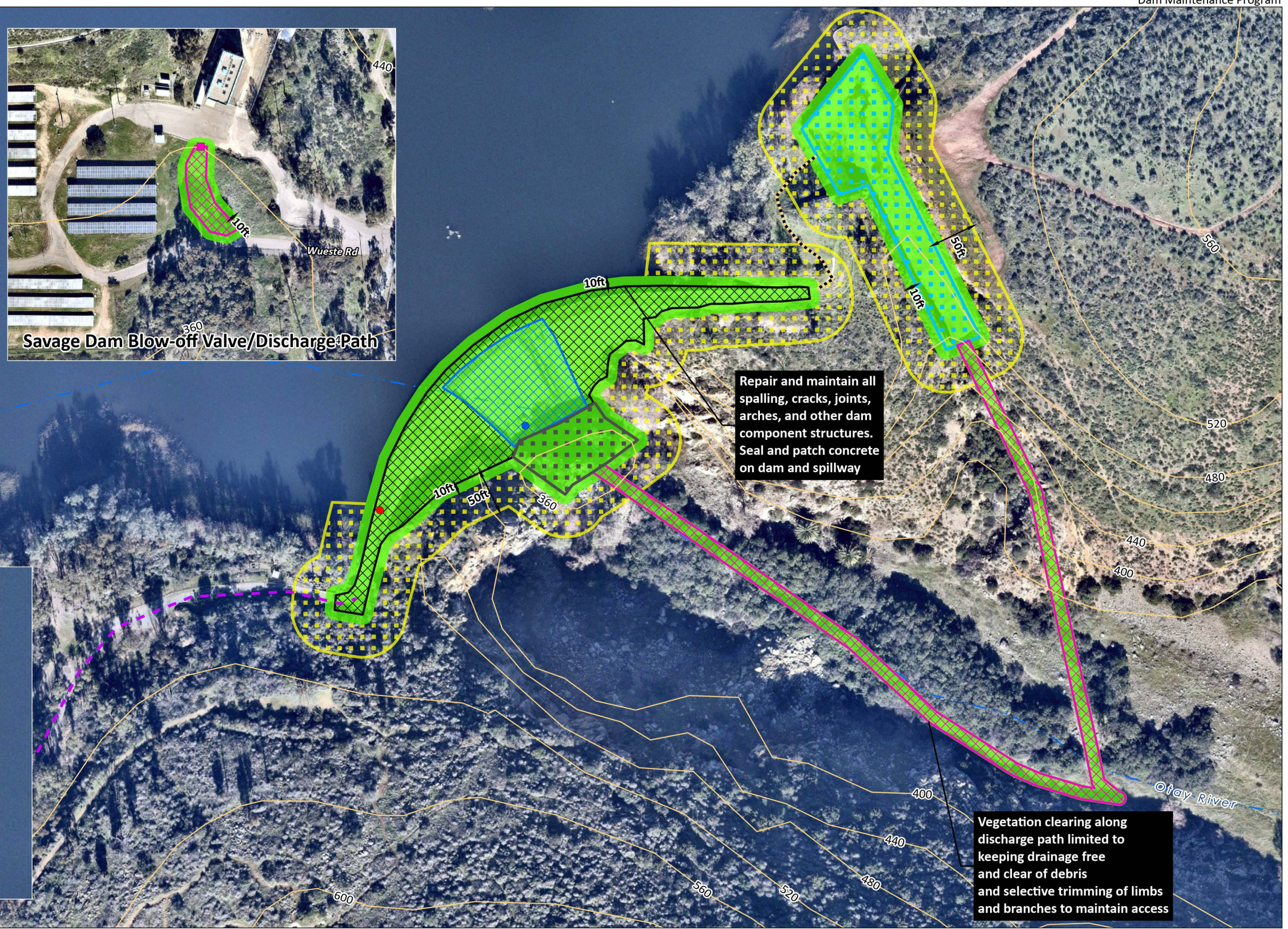
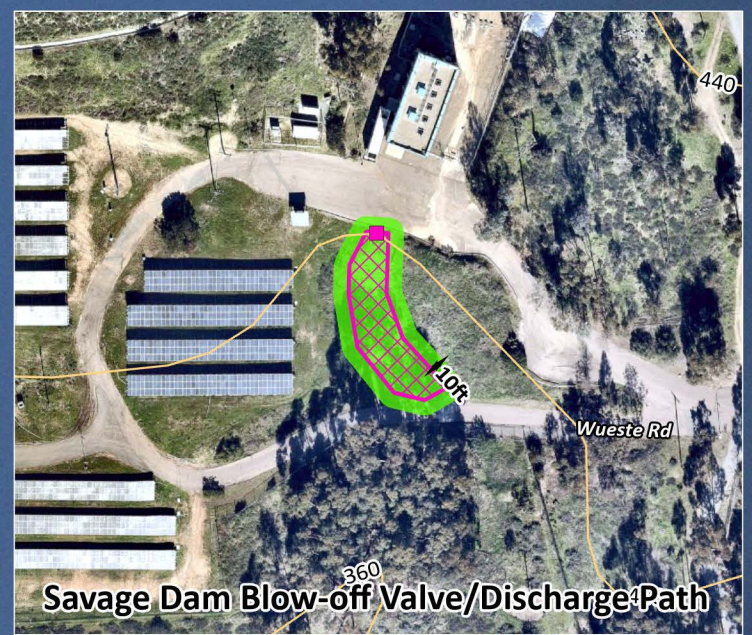
- Access Road
- Foot Path

**Maintenance Areas**

- Vegetation Clearing\*
- Eucalyptus Removal\*\*
- 40-foot Contours

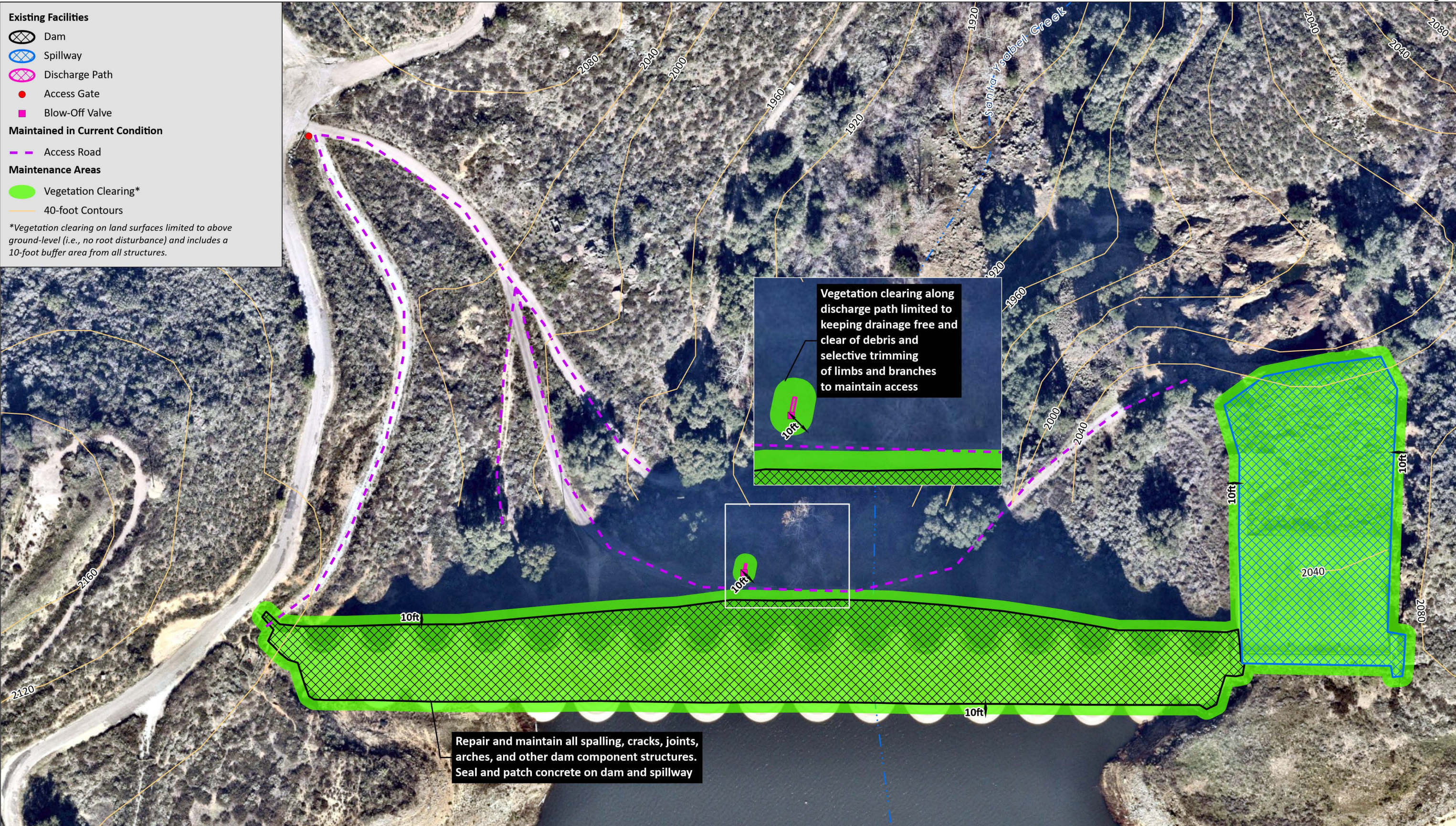
\*Vegetation clearing on land surfaces limited to above ground-level (i.e., no root disturbance) and includes a 10-foot buffer area from all structures.

\*\*Removal of eucalyptus trees will be limited to felling individuals trees within 50 feet of all permanent structures. Tree stumps will be left in place and treated with an approved herbicide; no root disturbance would occur

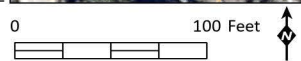


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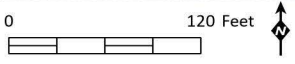


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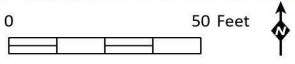


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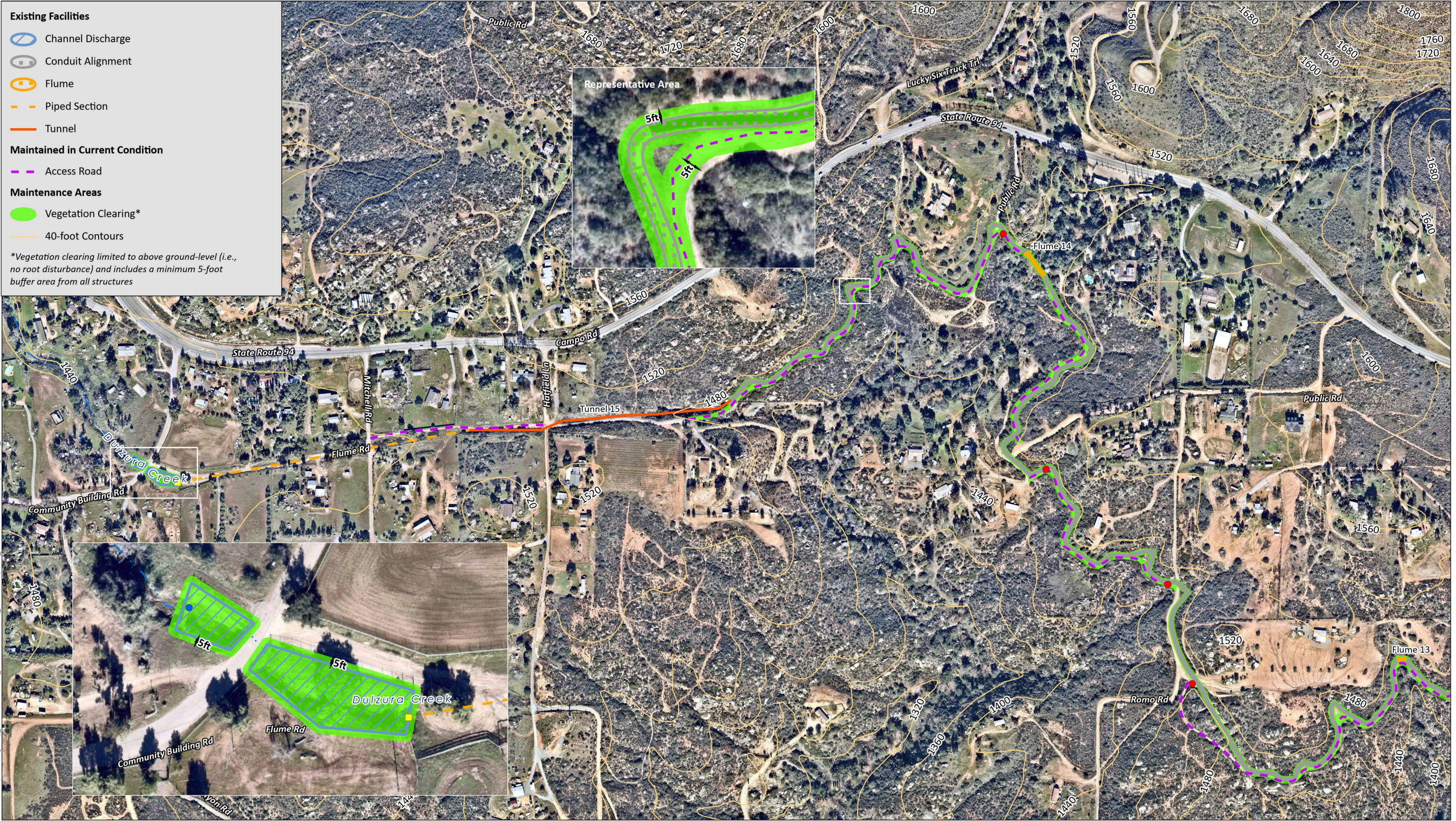


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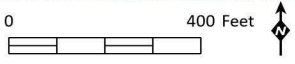
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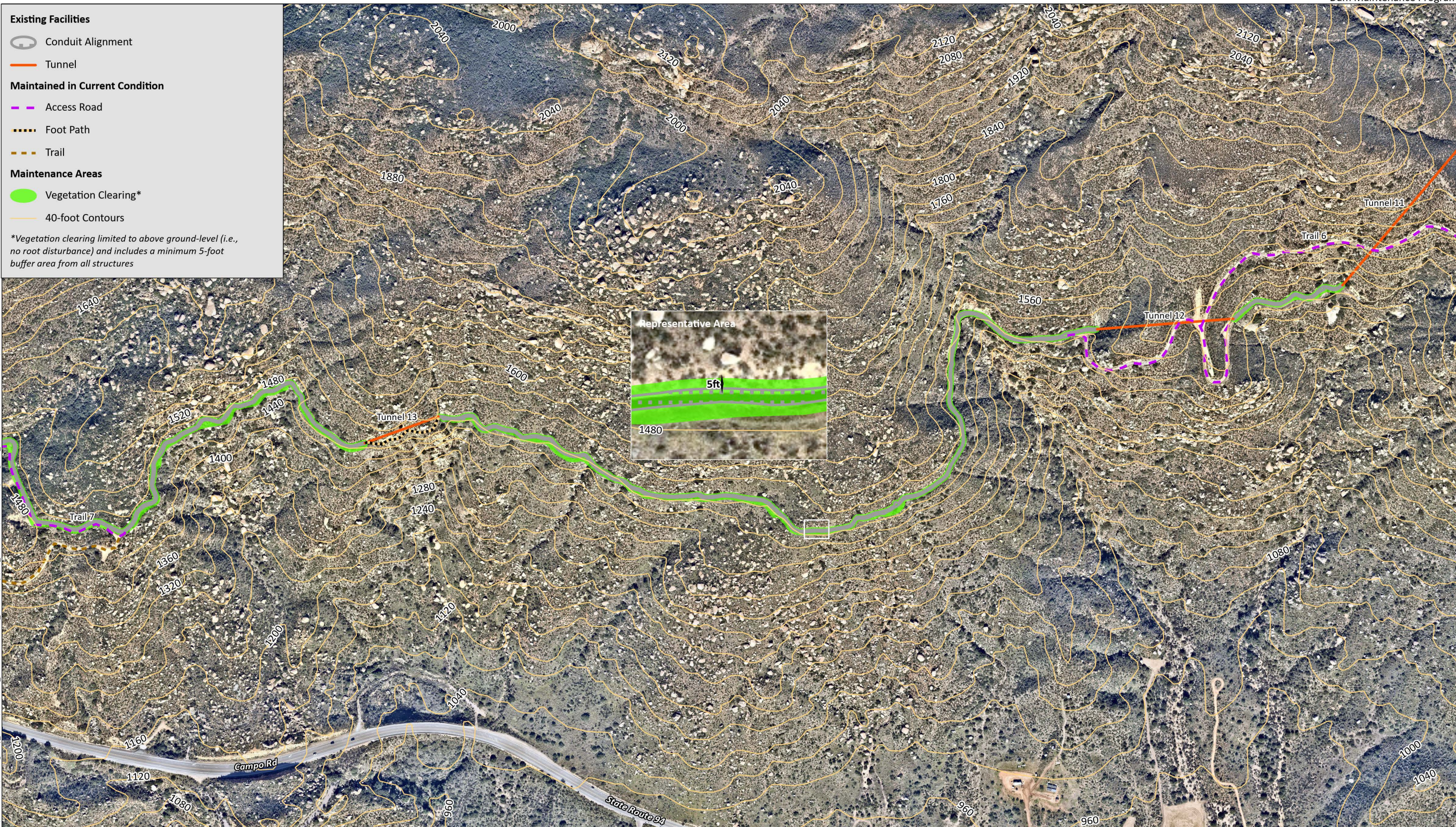


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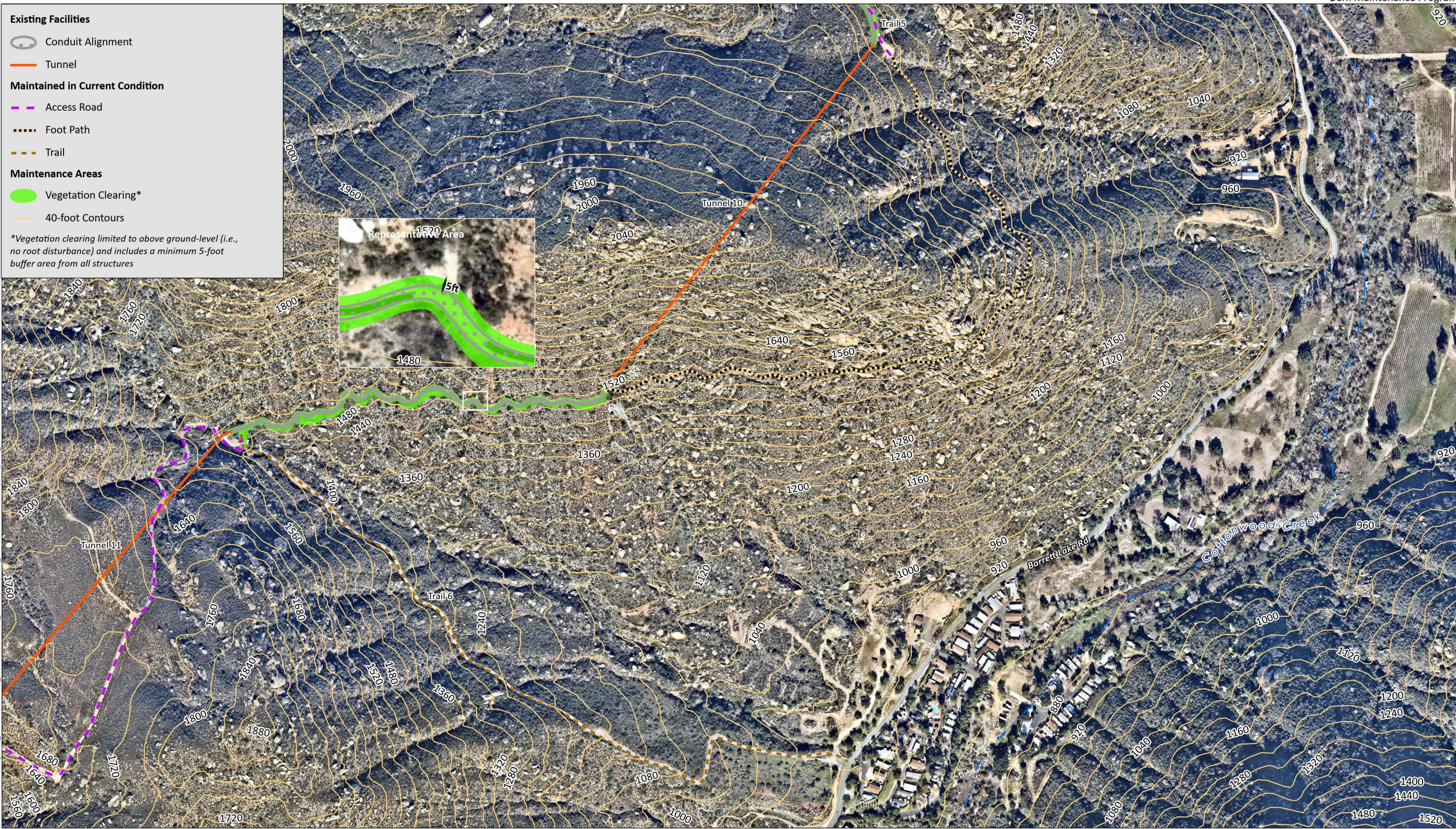




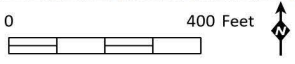
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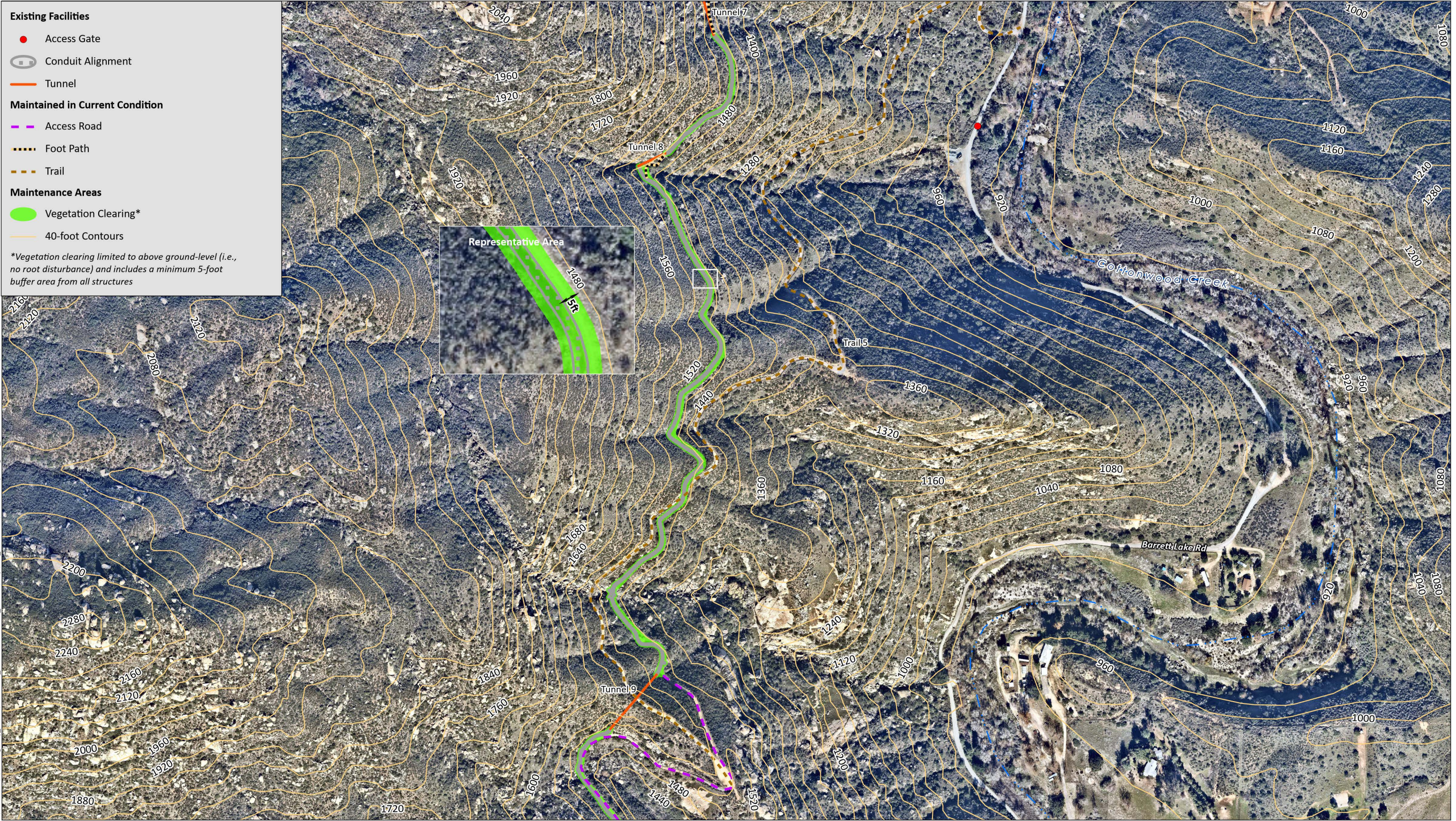


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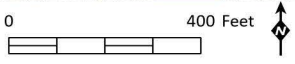


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Source: Aerial (SanGIS, 2017)





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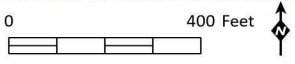


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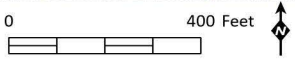


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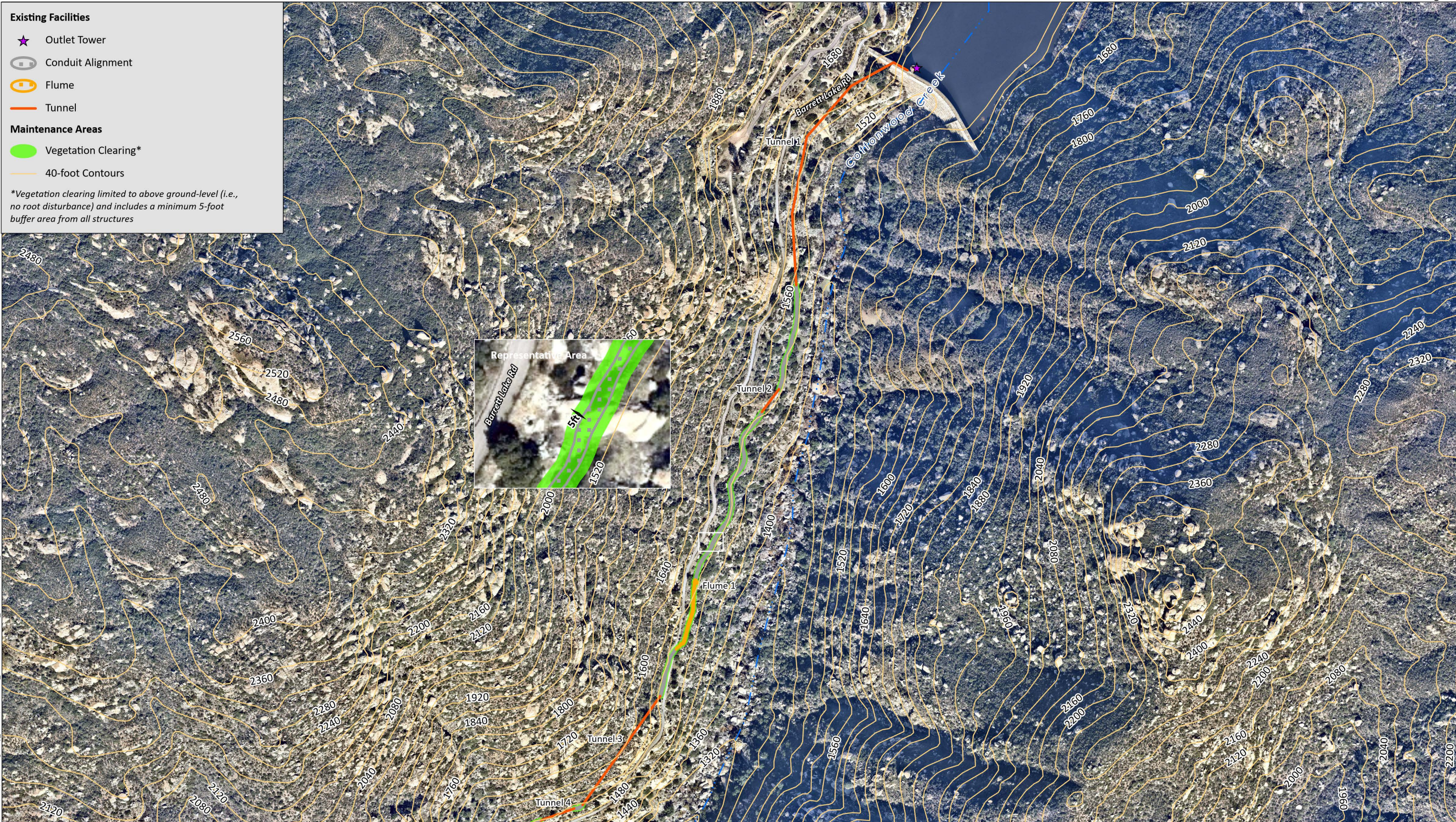


Source: Aerial (SanGIS, 2017)

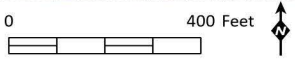








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Source: Aerial (SanGIS, 2017)



### 1.3.2 Black Mountain Dam

Black Mountain Dam is located in the northern portion of the City, in the community of Black Mountain Ranch. The dam is located south of Carmel Valley Road, east of Black Mountain Road, and north of Maler Road. The Black Mountain Dam maintenance area encompasses a concrete reservoir and associated infrastructure (i.e., headwall, discharge path, slope maintenance area, etc.), including an access road from Carmel Valley Road (Figure 2b, *Existing Facilities and Maintenance Footprint/Limits of Work – Black Mountain Dam*).

### 1.3.3 Chollas Dam

Chollas Dam is located in the central portion of the City (Figure 1). It is located at the outlet of Chollas Heights Reservoir, north of College Grove Drive, south of Fauna Drive, east of Chollas Station Road, and west of College Grove Way. The Chollas Dam maintenance area encompasses an earthen dam and associated infrastructure (i.e., headwall, discharge path, etc.), including a service access road from the west (Figures 2c-1 to 2c-2, *Existing Facilities and Maintenance Footprint/Limits of Work – Chollas Dam*).

### 1.3.4 El Capitan Dam

El Capitan Dam is located in the eastern portion of the County, in the unincorporated community of Lakeside. The dam is located at the outlet of El Capitan Reservoir along El Monte Road, north of Interstate 8, south of Featherstone Canyon Road, east of Lake Jennings Road, and west of Peutz Valley Road. The El Capitan Dam maintenance area encompasses a concrete dam and associated infrastructure (i.e., spillway, outlet tower, blow-off valves, discharge channel, etc.), including a northern and southern access road from El Monte Road (Figures 2d-1 to 2d-2, *Existing Facilities and Maintenance Footprint/Limits of Work – El Capitan Dam*). Long-term maintenance of the spillway and spillway channel is covered under the El Capitan Spillway Vegetation Removal Project (Project No. 679843; State Clearing House No. 2022050039) and is not included as part of this Program.

### 1.3.5 Hodges Dam

Hodges Dam is located in the north portion of the City. The dam is located at the outlet of Hodges Reservoir, north of Camino Santa Fe, south of Del Dios Road, east of Lake Drive, and west of Calle Ambiente. The Hodges Dam maintenance area encompasses the concrete dam and associated infrastructure (i.e., spillway approach and apron, training walls, weir, intake pipe, leakage pipes, blow-off valve, discharge channel, etc.), including western and eastern access roads from Del Dios Highway (Figures 2e-1 to 2e-2, *Existing Facilities and Maintenance Footprint/Limits of Work – Hodges Dam*).

### 1.3.6 Miramar Dam

Miramar Dam is located in the northern portion of the City. The dam is located at the outlet of Miramar Reservoir, north of Scripps Lake Drive, south and east of Scripps Ranch Boulevard, and west of Mira Lago Terrace. The Miramar Dam maintenance area encompasses the earthen dam and associated infrastructure (i.e., spillway, saddle dam, outlet tower, blow-off valve, discharge path, etc.), including a service access road from the east (Figure 2f, *Existing Facilities and Maintenance Footprint/Limits of Work – Miramar Dam*).



### 1.3.7 Morena Dam

Morena Dam is located in the eastern portion of the County, in the unincorporated community of Lake Morena. The dam is at the outlet of Morena Reservoir along Morena Reservoir Road, north of Hauser Creek Road, south of Skye Valley Road, and west of Lake Morena Drive. The Morena Dam maintenance area encompasses an earthen dam and associated infrastructure (i.e., spillway, outlet tower, weir, blow-off valve, discharge path, etc.), including a service access road from the east along Morena Reservoir Road (Figures 2g-1 to 2g-2, *Existing Facilities and Maintenance Footprint/Limits of Work – Morena Dam*).

### 1.3.8 Murray Dam

Murray Dam is located in the central portion of the City. The dam is located at the outlet of Murry Reservoir, north of Lake Murray Boulevard, south of Jackson Drive, east of Del Cerro Boulevard, and west of Baltimore Drive. The Murray Dam maintenance area encompasses a concrete dam and associated infrastructure (i.e., spillway, outlet tower, headwall, discharge path, etc.) (Figure 2h, *Existing Facilities and Maintenance Footprint/Limits of Work – Murray Dam*).

### 1.3.9 Rancho Bernardo Dam

Rancho Bernardo Dam is located in the northern portion of the City. Rancho Bernardo Dam is located north of Sun Summit Point, south of Cloudcrest Drive, east of Lofty Trail Drive, and west of Turtleback Road. The Rancho Bernardo Dam maintenance area encompasses a concrete reservoir, including surrounding slope maintenance areas (Figure 2i, *Existing Facilities and Maintenance Footprint/Limits of Work – Rancho Bernardo Dam*).

### 1.3.10 San Vicente Dam

San Vicente Dam is located in the central portion of the County, in the unincorporated community of Lakeside. The dam is located at the outlet of San Vicente Reservoir, north of Morena Avenue, south of Foster Truck Trail, east of SR-67, and west of Muth Valley Road. The San Vicente Dam maintenance area encompasses a concrete dam and associated infrastructure (i.e., spillway, saddle dam, outlet tower, intake pipe, discharge path, etc.), including service access roads from Morena Avenue (Figures 2j-1 to 2j-2, *Existing Facilities and Maintenance Footprint/Limits of Work – San Vicente Dam*).

### 1.3.11 Savage Dam

Savage (Lower Otay) Dam is located in the southern portion of the County, in the unincorporated community of Otay. The dam is located at the outlet of Lower Otay Reservoir, north of Alta Road, south of Otay Lakes Road, east of Wueste Road and Otay Lakes County Park, and west of the Otay Open Space Preserve. The Savage Dam maintenance area encompasses a concrete dam and associated infrastructure (i.e., spillway, auxiliary spillway, outlet tower, blow-off valve, discharge path, etc.), including a service access road from Wueste Road (Figures 2k-1 to 2k-2, *Existing Facilities and Maintenance Footprint/Limits of Work – Savage Dam*).

### 1.3.12 Sutherland Dam

Sutherland Dam is located in the northern portion of the County, in the unincorporated community of Ramona. The dam is located at the outlet of Sutherland Reservoir along Sutherland Dam Road, north of



SR-78, south and east of Black Canyon Road, and west of Rancho Ballena Road. The Sutherland Dam occurs in the City’s Sutherland Reservoir Open Space area and Cleveland National Forest. The Sutherland Dam study area encompasses a concrete dam and associated infrastructure (i.e., spillway, blow-off valve, discharge path, etc.), including service access roads from the north (Figure 2l, *Existing Facilities and Maintenance Footprint/Limits of Work – Sutherland Dam*).

### 1.3.13 Upper Otay Dam

Upper Otay Dam is located in the southern portion of the County, in the unincorporated community of Otay (Figure 1). The dam is located at the outlet of Upper Otay Reservoir, north of Otay Lakes Road, south of Proctor Valley Road, east of Centennial Trail, and west of Wueste Road. The Upper Otay Dam maintenance area encompasses a concrete dam and associated infrastructure (i.e., parapet wall, discharge inlet, discharge path, etc.), including service access roads from Otay Lakes Road (Figures 2m-1 to 2m-2, *Existing Facilities and Maintenance Footprint/Limits of Work – Upper Otay Dam*).

### 1.3.14 Dulzura Conduit

The approximately 13-mile-long Dulzura Conduit is located in the eastern portion of the County, in the unincorporated community of Dulzura. The northern terminus of the Dulzura Conduit is located at Barrett Dam; the southern terminus is located at the conduit’s confluence with Dulzura Creek, west of the Community Building Road and Flume Road intersection. The conduit traverses from Barrett Dam southward to Campo Road (SR 94), primarily along the eastern-facing slopes west of Lake Barrett Road. The conduit then travels under Campo Road and continues in a westerly direction towards Dulzura Creek, with the western underground portion paralleling Flume Road. The Dulzura Conduit maintenance area encompasses the entire length of the conduit, including piped sections, covered and uncovered portions of the trapezoidal channel, flumes, and tunnels; associated infrastructure such as flush gates, sand traps, siphon, and spillway; and designated access trails (Trails 1 through 7) and service access roads (Figures 2n-1 through 2n-9, *Existing Facilities and Maintenance Footprint/Limits of Work – Dulzura Conduit*).

## 2.0 MAINTENANCE ACTIVITIES AND METHODS

The following is a description of routine maintenance activities that will occur under this Program. Activities include maintenance of access roads, access trails, and pedestrian footpaths, maintenance of staging and material storage areas, trimming and clearing of vegetation, dredging, maintenance of outlet/intake towers and trash racks, removal of debris along spillways and other appurtenant structures to provide a clear path and remove obstructions, maintenance and repair of the dams and appurtenant structures to prevent deterioration that could lead to dam failure, concrete maintenance and repairs, maintenance and replacement of piezometers and survey monuments, and geotechnical investigations. Various methods will be used to complete these activities and are described below.

### 2.1 ACCESS ROAD AND STAGING AREA MAINTENANCE

Under this Program, existing access roads, access trails, pedestrian footpaths, and staging and material storage areas will continue to be maintained in a useable condition along the current path alignments and existing disturbed/developed footprints. No widening, expansion, relocation, or establishment of new access roads, access trails, footpaths, or staging areas are included as part of this Program. Routine



maintenance activities include the patching and minor surface repaving of paved access roads and trails and staging areas; patching and minimal grading of gravel and dirt access roads and trails and staging areas; filling of erosional voids, rills, and gullies caused by rain events; and minor trimming of vegetation to remove overhanging branching and other encroaching vegetation. Minor trimming of vegetation will also occur along footpaths, which are necessary to maintain pedestrian access to the toe of dams, dam leakage measuring structures, and weir and outlet work structures. Maintenance and repair activities along existing paved, gravel, and dirt access roads and trails will be limited to the current road width, generally 10 feet wide, and established road right-of-ways, where present. Maintenance of pedestrian footpaths will be limited to minor trimming of vegetation along the path alignment; no soil disturbance or removal of vegetation will occur as part of footpath maintenance. Maintenance and repair activities within staging and material storage areas will be limited to the current disturbed and developed footprints.

Access to the dams and associated infrastructure to complete maintenance activities covered under this Program, and detailed below, will occur along established access roads, access trails, and pedestrian footpaths. Any staging of equipment or materials required to complete activities will occur within existing staging and material storage areas, within disturbed and developed portions of the dam, or within existing developed lands on nearby City property at the reservoirs. These areas are maintained as parking and operational space for dam and reservoir maintenance staff. If direct access to outlet/intake towers from the dam is not available, crews, materials, and the necessary equipment to perform maintenance and repair activities, including dredging, will be transported to the outlet/intake towers utilizing a boat or barge launched from the reservoir's boat ramp.

## 2.2 VEGETATION CLEARING

Vegetation growing on and adjacent to the dams and associated infrastructure has the potential to hinder site access and safety inspections, visually obstruct dam components, interfere with safe operations, damage critical infrastructure, and possibly lead to dam failure. Removal of vegetation and debris is critical to the functioning of the dams and associated infrastructure, and Dulzura Conduit, as vegetation could reduce design capacity and prevent proper inspection of infrastructure. Clearing of vegetation will continue to be conducted on a routine basis under this Program to keep the maintenance area free and clear of vegetation. This will avoid the re-establishment of upland and wetland vegetation, as well as decrease the chances of introducing a new species into an existing maintenance area.

Vegetation clearing will be limited to the following activities and areas:

- Clearing of all vegetation located within at least 5 feet of Dulzura Conduit;
- Clearing of all vegetation located within 10 feet of the dams and associated infrastructure;
- Clearing of all marsh habitat (i.e., giant reed [*Arundo donax*], cattail [*Typha* spp.], bulrush [*Schoenoplectus* spp.], etc.) located within 10 feet of the dam;
- Removal of all trees located within 10 feet of the dams, saddle dams, parapet walls, and spillways;



- Removal of all eucalyptus (*Eucalyptus* spp.) trees located within 50 feet of the dam, saddle dams, parapet walls, and spillways;
- Clear and maintain all vegetation within 10 feet of all weirs; headwalls; blow-off and outlet valves; inlet and outlet pipes; discharge, leakage, and seepage pipes and associated discharge paths; and
- Maintain slopes surrounding Black Mountain and Rancho Bernardo Dams so that no trees are allowed to establish. The slopes will be maintained in their current condition so that only herbaceous vegetation and low-growing shrubs occur.

Clearing of vegetation on land surfaces will be limited to the above-ground portion of the vegetation, and the roots of all cut vegetation will be left in place to prevent soil disturbance and reduce potential erosion. Clearing of eucalyptus and other tree species will be completed by cutting trees at the base and treating the stumps with herbicide. Aquatic vegetation, such as cattails (*Typha* spp.) and bulrushes (*Schoenoplectus* spp.), will either be cut at the water surface, removed with mechanical equipment, or treated with an herbicide approved for aquatic use by the U.S. Environmental Protection Agency by a licensed applicator. Vegetation clearing work will be conducted with hand tools such as pole saws, chain saws, and weed eaters. Felled trees and aquatic vegetation will be removed from the area using mechanized equipment (such as a bobcat, backhoe, or excavator), where feasible, and transported to an appropriate waste management facility for disposal. Felled trees in areas inaccessible to mechanized equipment will be removed via helicopter.

## 2.3 DREDGING

Accumulated lake bottom sediment and debris covering dam infrastructure, such as lower saucer valve ports, will be removed through dredging to maintain operational function. Dredging will occur within a 50-foot radius of the outlet/intake tower base at Barrett, Chollas, El Capitan, Miramar, Morena, Murray, San Vicente, and Savage (Lower Otay) Dams, and within a 50-foot radius at the low-level outlet intake at Barrett, Hodges, and San Vicente Dams. The depth of dredging activities will be variable depending on site conditions.

There are two main dredging methods that will be employed under this Program: mechanical and hydraulic. Mechanical dredging typically involves a stationary, bucketed machine (such as a boom, clamshell, or backhoe) positioned on a barge that is lowered into the water to scoop up material. The dredged material is then raised above the water surface and deposited on a barge or other structure above the water surface. Hydraulic dredging utilizes a high-powered water pump to suction up material that is then pumped away from the dredge site. A dredging plan will be prepared and approved prior to the commencement of dredging activities at each location. The dredging plan will describe the scope of work, amount of material to be removed, method of dredging, equipment, access roads and points, staging area(s), duration and schedule, and protocols to be implemented. Dredged material will be removed from the reservoir and either disposed of at an appropriate disposal facility or reused in a beneficial capacity (e.g., agriculture).

## 2.4 OUTLET TOWER & TRASH RACK MAINTENANCE

Routine maintenance and minor repairs will occur to existing outlet/intake towers to maintain and improve the operational safety of the towers. Activities include filling cored holes on the operating



platform; repairing the valve rack; repairing concrete spalls; applying a top seal to waterproof and protect concrete surfaces and seal hairline cracks; coating metal covers, access ladders, and handrails to prevent corrosion; repairing and replacing access ladders; replacing access hatches (in-kind); replacing the safety chains across rails at the landing (in-kind); replacing or refurbishing of fall arrests; coating of the roof structural steel; and strengthening the concrete roof slab with the application of a fabric reinforced matrix. Equipment required to complete these activities will be limited to the use of manual and mechanical hand tools; no heavy machinery will be required. Additionally, trash racks will be regularly cleared, maintained, and kept free of debris that may block intake and outlet valves and other critical dam infrastructure hindering operational functionality.

## 2.5 SPILLWAY CLEARING

Accumulated debris such as dirt, rocks, boulders, and vegetation present on the spillways, spillway channels, and auxiliary spillways will be removed to maintain operational function and prevent damage to infrastructure. Debris will be removed by hand, where feasible, and heavy equipment including, but not limited to, a truck-mounted crane, rubber-wheeled front-end loader, track-mounted long arm excavator, track-mounted bobcat with jackhammer attachment, and dump trucks. Small equipment (such as a bobcat) will be lowered into the spillways and other appurtenant structures with a truck-mounted crane to move the debris to a point where it can be accessed by a long-arm track-mounted excavator positioned at the top of the structure. Boulders will be broken up into manageable pieces with a hydraulic jackhammer to allow for removal. A track-mounted excavator will lift the debris from the spillway and appurtenant structures and place it in a dump truck to be hauled away and disposed of at a licensed landfill or stockpiled on-site within disturbed/developed areas of the dam. Spillway clearing activities will be contained within the unvegetated spillways and appurtenant structures, existing access roads, previously disturbed workspaces and staging areas, and disturbed and developed areas adjacent to the dams.

Removal of soil, debris, and vegetation along the El Capitan Dam spillway, lower dam spillway, and spillway channel will be conducted as part of the El Capitan Dam Spillway Vegetation Removal Project (Project No. 679843; State Clearing House No. 2022050039). Long-term maintenance of these areas will be covered under the El Capitan Dam Spillway Vegetation Removal Project and is not included as part of this Program.

## 2.6 DAM MAINTENANCE AND REPAIRS

Routine maintenance and minor repairs of the dams and appurtenant structures will occur to prevent deterioration and maintain the integrity and functionality of critical dam infrastructure. The 13 City-owned dams covered under this Program include four earthen dams (Chollas, El Capitan, Miramar, and Morena Dams), seven concrete dams (Barrett, Hodges, Murray, San Vicente, Savage, Sutherland, and Upper Otay Dams), and two concrete reservoirs (Black Mountain and Rancho Bernardo).

Maintenance of earthen dams includes filling of voids, gullies, and rills caused by erosion on the upstream and downstream faces of the dam, and minor grading and regular compaction of the dam face and toe of the dam. Maintenance of concrete dams, reservoirs, and concreted appurtenant structures at earthen and concrete dams (i.e., saddle dams, parapet walls, spillways, etc.) includes repairs such as sealing of all joints and cracks with gaps with a flexible sealant to prevent infiltration of water and buildup of stagnation pressures; repairing all degraded concrete, spalls, and boulder impact areas within the spillway (channel floor and walls) and dam face and walls by cutting-out existing material then



replacing and patching material to prevent further damage; repairing spalled concrete on all elements of the dam, especially where reinforcing steel is exposed; and smoothing vertically-displaced joints on concrete surfaces by surface grinding or other approved methods.

Additionally, auxiliary infrastructure located on or within the dams will be maintained, repaired, and/or replaced, including perimeter fencing, piezometers and survey monuments, ladders, micrometers, electronic level sensors, and other instrumentation. All maintenance and repair activities will be performed on existing structures, with work activities limited to disturbed and developed portions of the dam.

## **2.7 DULZURA CONDUIT**

Routine maintenance and minor repairs of the Dulzura Conduit will occur to prevent flow impairment through the conduit and to maintain design capacity. The Dulzura Conduit is an approximately 13-mile-long aqueduct constructed to divert water from Barrett Dam Reservoir to Lower Otay Reservoir through a series of canals, flumes, and tunnels. Water is released into the conduit through the Barrett Dam outlet tower by a 30-inch drainpipe. Upgrades to the conduit were completed in 2011, with a majority of the conduit now comprised of concrete channels and steel pipes. The average depth of the concrete trench segments is approximately four and a half feet, with a bottom width of three feet, and a top width of approximately six feet. The flume is a combination of enclosed metal flumes, measuring approximately four feet in interior diameter, and board-formed poured concrete. Existing access roads and trails are constructed of decomposed granite, gravel, or concrete. Pedestrian footpaths primarily consist of dirt paths, and in some cases, small steel catwalks.

Maintenance activities along Dulzura Conduit involve the removal of landslide debris, rocks and boulders, and vegetation within the concrete conduit and the repair of damaged or deteriorating sections of the existing conduit with in-kind materials. Repairs of the existing concrete conduit will be completed with shotcrete and include the installation of reinforcing mesh, ground wires, and compound curing. The shotcrete will be broom finished by hand. Large boulders that are found to be blocking the conduit will be broken up into manageable pieces with the use of approved expansive chemical agents and/or mechanical equipment.

All inspection, repair, and maintenance activities along Dulzura Conduit will occur within the existing developed footprint of the conduit, pedestrian footpaths, and access roads and trails. The remote location of the conduit, rugged terrain, and limited vehicle access make typical maintenance activities challenging. Maintenance and construction personnel will access the site through existing access roads, access trails, and pedestrian footpaths. Helicopters will airlift supplies, equipment (i.e., mini excavator, bobcat, etc.), and debris that cannot be hand carried to and from the repair sites or removed with maintenance vehicles. Helicopter landing, materials, and equipment staging areas will be located within existing developed lands on nearby City property at Barrett Reservoir. These areas are maintained as parking and operational space for dam and reservoir maintenance staff.

## **2.8 GEOTECHNICAL INVESTIGATIONS**

Subsurface geotechnical investigation of the dams, foundations, and associated infrastructure will occur as part of periodic condition assessments. Geotechnical investigations will include seismic stability analysis using modern techniques, penetration tests, and borings. The techniques used to perform the investigations will be limited to a small footprint within existing disturbed and developed areas



associated with the dams and along access roads. No vegetation will be removed as part of the geotechnical investigation activities, and no native soil will be impacted as excavations will be conducted within disturbed soils of previously installed infrastructure (i.e., rockfill and concrete).

## 2.9 FREQUENCY OF MAINTENANCE ACTIVITIES

The frequency of maintenance activities will be based on routine inspections and recommendations identified in the DSOD annual inspection reports. Factors influencing the timing and frequency of maintenance events include, but are not limited to, current conditions, past maintenance history, and risk assessment. In general, the clearing of vegetation is anticipated to occur annually, though the extent of clearing will depend on the current conditions at each location. Other maintenance activities will occur on an as-needed basis, as directed by the DSOD and City PUD.

Maintenance activities may need to be conducted in the event of an emergency. “Emergency” means a sudden, unexpected occurrence, involving a clear and imminent danger, demanding immediate action to prevent or mitigate the loss of, or damage to, life, health, property, or essential public services. Physical evidence, such as observation of surcharging conditions, blockages by debris/rocks/roots, or holes/cracks/offsets in dam infrastructure, or where impacts to vegetation, wetlands, and landforms have resulted from surcharging conditions (unanticipated water releases), will demonstrate emergency conditions.

## 3.0 PROGRAM APPROVALS

Implementation of maintenance activities included in this Program requires a variety of discretionary actions. Due to the long-term nature of the Program, long-term (master) permits from the City, as well as state and federal agencies, are being sought to streamline the maintenance process. The following long-term environmental authorizations are anticipated to be required:

### City of San Diego

- Master Site Development Permit (SDP) under the City’s Land Development Code Section 126.0502.

### State

- 401 Water Quality Certification by the California Regional Water Quality Control Board (RWQCB) under Section 401 of the Clean Water Act (CWA) and State Porter-Cologne Water Quality Control Act. If surface discharges of water are involved, a Wastewater Discharge Permit will be required from the RWQCB.
- Lake and Streambed Alteration Agreement by the California Department of Fish and Wildlife (CDFW) under Section 1602 of the California Fish and Game Code.

### Federal

- Regional General Permit by the U.S. Army Corps of Engineers (USACE) under Section 404 of the CWA.
- U.S. Fish and Wildlife Service (USFWS) – Section 10(a) Permit or Biological Opinion.



- State Historic Preservation Office – Section 106 Consultation.

In the event of an emergency, after-the-fact permits, which may be required by the City, state, or federal agencies for emergency maintenance will be obtained.

## **4.0 MAINTENANCE IMPLEMENTATION PROCEDURES**

Maintenance activities described in this Plan will commence upon approval of this Program and issuance of the Master SDP. However, maintenance activities located within waters and wetlands subject to the jurisdiction of the USACE, RWQCB, and/or CDFW will commence upon issuance of the appropriate regulatory permits. The overall maintenance process is summarized below.

### **4.1 MAINTENANCE DETERMINATION PROCESS**

The maintenance determination process will begin with a review of information compiled by the City PUD and maintenance recommendations and mandates provided by DSOD. The City PUD will complete technical assessments of each facility and develop a maintenance plan for each planned activity, as determined necessary. The proposed maintenance activities will be reviewed and approved by the City PUD prior to the initiation of activities. Maintenance activities will be limited to the Program’s maintenance footprint, as shown in Figures 2a through 2n, and will follow the methods and procedures, as described in this Plan, and occur on an annual to as-needed basis as directed by the City PUD and DSOD.

### **4.2 PRE-MAINTENANCE PLANNING**

#### **4.2.1 Maintenance Plan**

If necessary, a site-specific maintenance plan will be prepared for the planned maintenance activity prior to the initiation of maintenance. The maintenance plan will describe the scope of work, limits of maintenance, maintenance method, equipment, access roads and points, staging area(s), duration and schedule, and protocols to be implemented. If dredging activities are to occur, a site-specific dredging plan will also be prepared. Maintenance crews and technical staff will use the maintenance plan to direct and limit maintenance activities within the appropriate work areas.

#### **4.2.2 Technical Assessments**

The City PUD will conduct site-specific technical assessments for each maintenance activity to determine if the activities will result in impacts to sensitive biological or historical resources. The assessment will include a description of the proposed maintenance activity(ies); summary of any field surveys completed; identification of any sensitive biological and historical resources present within the maintenance area, and those with potential to occur, if appropriate; description and quantification, as needed, of impacts to all sensitive biological and historical resources; and identification of any resource protection or avoidance measures. If the proposed maintenance activity(ies) were to result in impacts to sensitive biological resources or significant historical resources, the associated assessment will identify the mitigation measures and permit conditions to be implemented to minimize the impact(s) in



accordance with the approved Mitigation and Monitoring Reporting Program (MMRP) and master permits, including regulatory permits, as applicable.

The Program will generally not involve any maintenance efforts that will generate issues related to geology and soils, as routine maintenance and repair activities will not involve grading or excavation at sufficient depths or volumes that will affect geologic resources. However, maintenance activities such as geotechnical investigations (borings) or dredging may require the preparation of a site-specific geotechnical investigation report to evaluate the geologic hazards of that maintenance activity.

#### **4.2.3 Permit Requirements and Mitigation Measures**

Maintenance activities will occur within environmentally sensitive lands that support sensitive biological and jurisdictional waters and wetlands and will require the issuance of appropriate permits. As part of the environmental review process, mitigation measures will be developed and included in the Program’s approved MMRP. The complete and final text of mitigation measures will be part of the certified Final Mitigated Negative Declaration (MND). The City is also pursuing programmatic regulatory permits with the required state (RWQCB and CDFW) and federal (USACE and USFWS) agencies to authorize activities proposed under this Program. These regulatory permits are anticipated to contain additional requirements such as notifications, receipt of letters of authorization, approval of compensatory mitigation, and implementation of pre-construction surveys and monitoring for sensitive resources. Prior to the implementation of maintenance or repair activities, the City will review and ensure compliance with all applicable maintenance procedures, mitigation measures, and regulatory permit requirements.

#### **4.2.4 Substantial Conformance Review Process**

City PUD will complete a review of maintenance and repair activities to confirm that work will be completed within the maintenance footprint described in this Plan and is in conformance with the methods detailed in this Plan. Consistency with the Program’s final environmental documents, mitigation measures, and conditions will be determined by City PUD in compliance with the applicable delegation of authority under the California Environmental Quality Act (CEQA) provided by the City’s Planning Department.

Maintenance or repair activity deviating from the maintenance activities and methods detailed in this Plan or located outside of the defined maintenance footprint will be submitted to the City’s Development Services Department (DSD) for a Substantial Conformance Review (SCR) to determine if the activity is consistent with the Program’s SDP. As part of the SCR process, DSD will determine if the planned maintenance activity deviating from the Program description or maintenance footprint is consistent with the SDP and applicable mitigation measures and conditions included in that permit. If DSD determines that maintenance activities substantially conform, work may proceed. Any maintenance activities or expansion in the maintenance footprint that are not in substantial conformance will require a new or amended permit to address any new impacts that may occur and subsequent CEQA review.

### **4.3 MAINTENANCE IMPLEMENTATION**

Maintenance activities under this Program will commence once activities have been approved by the City PUD, as well as the state and federal agencies with jurisdiction over waterways and wetlands



occurring within the maintenance footprint. Maintenance activities will occur based on the following steps:

#### **4.3.1 Pre-Maintenance Meeting**

If sensitive biological or historical resources are present within or immediately adjacent to the maintenance area, a pre-maintenance meeting will be held with the technical specialists to review the measures required to protect these resources.

#### **4.3.2 Maintenance Area and Access Route Field Delineation**

The approved maintenance work area and access routes will be delineated in the field in accordance with the site-specific maintenance plan, as applicable. Where the maintenance area occurs within or adjacent to sensitive biological or historical resources, a Qualified Biologist or Archaeologist will clearly delineate with flagging, orange fencing, or the equivalent, the sensitive biological or historical resource areas that are to be avoided. The Qualified Biologist/Archaeologist will check for any substantial change in site conditions from those shown on the maintenance plan and have the authority to refine the access routes and maintenance methods, whenever possible, to avoid or reduce impacts to sensitive resources.

#### **4.3.3 Sensitive Biological Resources Protection**

Prior to initiating any clearing or grubbing activities which may adversely affect a sensitive biological resource, a Qualified Biologist will conduct any necessary pre-maintenance surveys, including bird nest surveys, to provide for compliance with the Migratory Bird Treaty Act (16 U.S.C. §§703 *et seq.*), California Fish and Game Code, and mitigation measures and permit conditions contained in the approved MMRP, master permits, and/or regulatory permits. Pre-maintenance surveys will be conducted within the specific periods specified in the Program’s final environmental documents, and/or permit conditions. A Qualified Biologist will also implement avoidance and/or mitigation measures identified in the approved MMRP, master permits, and/or regulatory permits.

#### **4.3.4 Historical Resources Protection and Mitigation**

If historical resources were identified during the technical assessment, a Qualified Archaeologist will implement avoidance and/or mitigation measures identified in the approved MMRP and master permits.

#### **4.3.5 Maintenance and Repair Activities**

Maintenance and repair activities will be completed following the methods described in Section 2.0 and those detailed in any site-specific maintenance or dredging plan, as applicable.

#### **4.3.6 Weed Control**

Weeds will be removed from maintenance and access areas to prevent the introduction of invasive species. Areas will be monitored by the City staff during routine inspections.



### **4.3.7 Waste Management**

All debris accumulated during the maintenance process will be removed from the site within one week following the completion of maintenance activities using the appropriate waste removal procedure (e.g., vacuum/pressure truck, dump truck, etc.) and disposed of at an appropriate off-site location.

### **4.3.8 Erosion Control Measures**

Following completion of the maintenance activities and removal of all spoils and equipment, temporary erosion control devices such as straw wattles, geotextile blankets/nets, and/or hydroseed will be installed, as necessary.

### **4.3.9 Post-Maintenance Assessment and Documentation**

Post-maintenance biological and historical surveys will be conducted, as necessary, to confirm that the actual impacts resulting from maintenance were consistent with the impact assumptions detailed in the maintenance plan(s) and/or technical assessment(s). Based on the actual impacts resulting from maintenance, the City PUD will undertake the appropriate mitigation measures in accordance with the approved MMRP, master permits, and/or regulatory permits. A post-maintenance record will be prepared, summarizing the maintenance and repair activities completed, the area disturbed by maintenance and repair activities, final impacts to sensitive biological or historical resources, and mitigation measures implemented.

## **4.4 COMPENSATORY MITIGATION**

Maintenance and repair activities completed under this Program will result in impacts to wetland habitats and sensitive uplands that require compensatory mitigation at ratios prescribed by the City's Biology Guidelines (2018) and regulatory permits, as applicable. It should be noted that maintenance activities will occur over an extended period; therefore, the overall Program impacts will not occur all at one time. Furthermore, the clearing of vegetation will continue to be conducted on a routine basis under this Program to keep the maintenance areas free and clear of vegetation. Compensatory mitigation for impacts associated with routine, ongoing maintenance of wetland habitats and sensitive uplands will occur on a one-time basis and will be accomplished in accordance with the mitigation framework detailed in the approved MMRP and summarized below.

Mitigation will be accomplished through one or more of the following: allocation of available mitigation credits at existing PUD mitigation sites; purchase of mitigation credits at an approved mitigation bank; habitat creation, restoration, and/or enhancement; and/or acquisition and preservation of specific land. The City is in the process of evaluating mitigation opportunities at existing PUD lands (including allocation of mitigation credits at existing mitigation lands) and/or new lands, as appropriate. Allocation of available credits is anticipated to occur at the following PUD mitigation sites: San Diego River (Stadium) Wetland Mitigation Project, Camino del Rio North – San Diego River Creation, Lake Murray, Rancho Mission Enhancement, and Marron Valley Cornerstone Lands Conservation Bank. Purchase of mitigation credits may occur at the future Homefed Otay River Mitigation Bank and/or future San Pasqual Valley Mitigation Bank. Additional PUD mitigation sites, including future sites or other mitigation banks, may be used as approved by the City and applicable regulatory agencies. A mitigation plan(s) will be prepared for any proposed habitat creation, restoration, and/or enhancement that will be completed to offset the Program's impacts and meet the Program's mitigation obligations.



Wetland mitigation required as part of any federal (USACE) or state (RWQCB/CDFW) wetland permit will supersede, and not be in addition to, wetland mitigation identified in the final MND for any waters and wetland areas covered under any federal or state wetland permit. Wetland habitat outside the jurisdiction of the federal and state permits, if present, will be mitigated in accordance with the final MND and approved MMRP.

## **4.5 REPORTING**

An annual Program Monitoring Report summarizing any programmatic maintenance activities and associated mitigation measures (including the status of compensatory mitigation) that took place during the preceding year will be prepared and submitted to the designated City departments and state and federal agencies. This report will include a summary of biological resources impacted during maintenance and repair activities, any associated mitigation that occurred, and a summary of the status of mitigation that has been carried out during the current and previous years to compensate for impacts to upland and wetland vegetation, as well as special status species.



## 5.0 REFERENCES

San Diego, City of (City). 2018. City of San Diego Municipal Code, Land Development Code, Biology Guidelines. Amended. February 1 by Resolution No. R-311507. Available at: [https://www.sandiego.gov/sites/default/files/amendment\\_to\\_the\\_land\\_development\\_manual\\_biology\\_guidelines\\_february\\_2018\\_-\\_clean.pdf](https://www.sandiego.gov/sites/default/files/amendment_to_the_land_development_manual_biology_guidelines_february_2018_-_clean.pdf).