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LIST OF ACRONYMS

ac-ft	acre-feet
BMP	Best Management Practice
CFR	Code of Federal Regulations
cfs	cubic feet per second
cy	cubic yard
FERC	Federal Energy Regulatory Commission
Forest Service	United States Forest Service
HDPE/PVC	high-density polyethylene/polyvinyl chloride
kW	kilowatt
NPS	National Park Service
lb.	pound
PMF	Probable Maximum Flood
Project or Proposed Project	Rush Creek Project

RT	round trip
SCE	Southern California Edison Company
SR-158	State Route 158
SUP	Special Use Permit
SWPPP	Stormwater Pollution Prevention Plan
US-395	United States Route 395
USGS	United States Geological Survey

3.0 PROPOSED PROJECT ALTERNATIVES

3.1 INTRODUCTION

This section describes the alternatives for the disposition of facilities at Rush Meadows Dam, Agnew Dam, and Gem Dam under consideration in the relicensing proceeding for Southern California Edison Company's (SCE) Rush Creek Project (Project or Proposed Project) (Federal Energy Regulatory Commission [FERC] Project No. 1389). Refer to Map 2-1 for a general Project vicinity and land jurisdiction map. Figure 3-1 provides a draft overview schedule of the relicensing process, permitting, and decommissioning/retrofitting construction activities.

Two Proposed Project alternatives have been identified to bookend the analysis for disposition of Rush Meadows and Agnew dams, namely:

- Full dam removal
- Partial dam removal

Under each relicensing alternative, hydroelectric operations at Rush Meadows and Agnew dams will be discontinued, and these facilities will be removed from the FERC license once all license conditions and regulatory requirements of FERC and other resource agencies are met.

One Proposed Project alternative is under consideration at Gem Dam, namely:

- Retrofitting the dam to meet seismic restrictions under a probable maximum flood (PMF) event with a new spillway and reduced dam height.

Under this alternative, hydroelectric operations at Gem Dam and Rush Creek Powerhouse will continue under FERC jurisdiction consistent with conditions identified in a new FERC license.

The alternatives were developed at a conceptual engineering level of design with structural modeling completed for the Gem Dam retrofitting. During the relicensing proceeding, other alternatives for Project disposition could be identified and may warrant further analysis in the Application for New License.

3.2 ACTIVITIES COMMON AMONG ALTERNATIVES

Although the Proposed Project alternatives for Rush Meadows, Agnew, and Gem dams vary in their locations, objectives, specific construction activities, timing, and duration, the general activities common among all the alternatives include (1) establishment of June Mountain Ski Area Parking Lot as the Base of Operations; (2) establishment of the construction area; (3) general construction activities; (4) disposition of other Project facilities; and (5) outreach activities. Each of these common activities are described below.

Project-specific information on the construction area, worker housing, transport of personnel, construction activities, and restoration activities is discussed in detail for each Proposed Project alternative in Sections 3.3 through 3.5.

3.2.1 June Mountain Ski Area Parking Lot (Base of Operations)

Pending issuance of a Special Use Permit (SUP) from the United States Forest Service (Forest Service), the Base of Operations for all alternatives will be established at the June Mountain Ski Area Parking Lot (Map 3-1). The following activities are associated with the Base of Operations.

The Base of Operations will be established at the beginning of each construction season and will include the following:

- Project Management Facilities
 - An office trailer powered by a generator (up to 25 kilowatts [kW]) will be installed for SCE project management and construction oversight personnel.
 - An office trailer powered by a generator (up to 25-kW) will be installed for the contractor's construction personnel.
- Helicopter Landing Site
 - K-rail barriers will be used to control access to the helicopter landing site.
 - Helicopter fuel storage tanks and appropriate secondary containment and fire prevention/response equipment will be located adjacent to the landing site.
- Supporting Construction Equipment
 - Table 3-1 provides a preliminary list of construction equipment that will be located at the Base of Operations.
- Staging Area
 - The staging area will be used to store construction equipment and materials.
 - Several shipping containers will be used to secure smaller construction materials and equipment.
- Stockpile Area
 - The stockpile area will be used to temporarily store material removed from the construction sites prior to transport to an approved disposal site.

- Specific locations within the stockpile area will be designated to temporarily store material based on its characteristics (i.e., hazardous/non-hazardous) and ultimate disposal location.
- Debris boxes may be used to contain small waste material, as appropriate.
- Designated General Parking Area
 - The general parking area will be used by project managers, construction personnel, subcontractors, and other support personnel. Construction equipment will be parked at a designated location within the staging area.
- Sanitary Facilities
 - Sanitary facilities (i.e., port-a-johns) will be provided commensurate with the number of personnel using the site.
 - A local contractor will clean and maintain the sanitary facilities.
- Security
 - A security kiosk and entrance gate will be installed at the entrance to the Base of Operations.
 - Security personnel will be on-site 24 hours per day to control site access during the construction season.
- Fire Suppression Equipment
 - Fire prevention will be implemented consistent with a Project-specific Fire Prevention/Protection Plan and will include, but is not limited to, staging of the following equipment at the Base of Operations to expeditiously extinguish any fire resulting from Project activities:
 - Fire box with enough tools to outfit the average number of workers on the site;
 - Type 6 fire engines with minimum of 300 gallons of water; and
 - Water tender with at least 50 feet of hose and a nozzle.

3.2.1.1 Transport of Personnel, Equipment, and Material

The Base of Operations will function as the transportation hub for construction activities, including (1) arrival and departure of personnel to the job site; (2) receiving center for arrival and departure of construction equipment and material from the contractors and supply companies; (3) transport of equipment and material to/from the dam construction areas; and (4) receipt and loading of debris/material removed from the dam construction

areas for transport to an approved disposal site. The following describes these transportation-related activities:

- Personnel, Equipment, and Material Access
 - The Base of Operations is located directly off State Route 158 (SR-158; also known as the June Lake Loop). Personnel will arrive/depart via SR-158 using either the northern or southern route of the loop road. SR-158 intersects United States Route 395 (US-395), the primary travel route into the region.
 - Construction equipment and vehicles hauling material will arrive/depart via SR-158 using the northern route of the loop road to avoid traffic through the community of June Lake.
- Construction Area Access
 - Specific information regarding access to the construction area from the Base of Operations is unique to each Proposed Project alternative and is provided in Sections 3.3 through 3.5. The following access to/from the construction areas is common to each alternative.
 - During mobilization and demobilization, heavy equipment will be transported to/from the construction areas using a Skycrane helicopter (lift capacity of 15,000 pounds [lbs.]).
 - During the construction season, equipment and material will be transported to/from the construction areas, as needed, using sling loads attached to either a Skycrane helicopter, A-Star helicopter (lift capacity of 2,500 lbs.), or modified Black Hawk helicopters (lift capacity of 6,000 lbs.).
- Construction debris will be transported from the construction areas using sling loads attached to a helicopter to the Base of Operations for stockpiling prior to transport to an approved disposal site.
- Transport of Disposal Material
 - Transport of material (debris) from the Base of Operations to an approved disposal site that is common among alternatives consists of the following:
 - Non-hazardous construction debris stockpiled at the Base of Operations will be transported to the Benton Crossing Landfill or another approved disposal site on a daily/weekly basis. To travel to the Benton Crossing Landfill, haul trucks will leave the Base of Operations and travel east on SR-158 for approximately 12 miles to the northern intersection with US-395. The haul trucks will continue south on US-395 for approximately 20 miles and then travel north on Benton Crossing Road for approximately 6 miles to the landfill.

- Hazardous waste will be hauled by truck, consistent with state and federal regulations, for disposal at an approved hazardous waste disposal site (i.e., Ridgecrest, California; Los Angeles, California; or Beatty, Nevada).
- California Department of Transportation and county authorizations will be obtained, as necessary, for road use.

3.2.1.2 Winterization

Winterization of the Base of Operations will be completed at the end of each construction season according to the following procedures:

- All construction equipment and materials, fuel tanks, trailers, sanitation facilities, secondary containment features, kiosks, signage, and K-rails will be removed from the site.
- The site will be restored to conditions that allow for winter ski operations consistent with requirements of the Forest Service SUP.

3.2.2 Construction Area

For each Proposed Project alternative, a construction area will be established at the beginning of each construction season, including the following:

- Medical Kiosk
 - An emergency medical technician(s) and support equipment will be present in the construction area during construction hours.
- Work Area
 - Construction activities associated with the dam removal/retrofitting will occur within designated work areas located upstream and downstream of Project dams. All work, staging, and stockpile areas will be flagged prior to initiation of construction activities.
- Staging Areas
 - SCE will designate the following staging area(s) for each alternative:
 - A staging area located near the dam that may consist of:
 - One or more wood decks erected to provide a flat and stable surface for generators, compressors, fuel, spill prevention kits, and toolboxes. The decks will include secondary containment areas.

- Diesel fuel tanks that will be flown in, as needed, and stored in designated secondary containment areas.
 - Additional areas, as necessary, to store equipment and material.
 - A mule team staging area(s) located near the dam to facilitate transport of personnel, if appropriate.
 - The work area may also be used to stage equipment and material, as needed, during construction activities.
- Stockpile Areas
 - All hazardous material encountered during dam removal/retrofitting will be temporary stockpiled within the construction/work area prior to transport off-site.
 - Material from the disposition of Agnew Dam suitable for use in the retrofitting of Gem Dam will be stockpiled for future use within the construction/work area of Agnew Dam or Gem Dam outside the wilderness boundary.
 - All other material/debris will be temporary stockpiled in designated areas prior to being transport off-site.
- Sanitation Facilities
 - Port-a-johns will be transported by helicopter to the construction area. The number of sanitation facilities will be commensurate with the number of personnel on-site. The port-a-johns will be replaced once per week. Secondary containment will be placed under the port-a-johns to contain any potential spills.

3.2.2.1 Winterization

Winterization of the construction area will be completed at the end of each construction season according to the following general procedures:

- Remove the temporary cofferdam (super sacks/sandbags), dewatering pipes, and pumps (if present) from the active lakebed and transport to a staging area.
 - The super sacks and pipes will be covered, contained, and stored over the winter consistent with Forest Service guidance to be developed during the relicensing proceeding.
- Install temporary erosion control features in the construction area to stabilize soil where necessary.

- Consolidate, cover, contain, and store construction and Best Management Practice (BMP) materials for the following year, as needed, at a staging area, consistent with Forest Service guidance to be developed during the relicensing proceeding.
- Winterize the work, staging, and stockpile areas in accordance with requirements of the Project-specific Stormwater Pollution Prevention Plan (SWPPP).
- Use helicopters to remove all construction equipment, fuel tanks, sanitary facilities, and secondary containment features from the construction area and transport to the Base of Operations.
- Use mules to remove personnel equipment, supplies, and trash from the construction area.

3.2.3 General Construction Activities

The following sections describe the general construction activities associated with dam removal/retrofitting that will be implemented for each Proposed Project alternative. A detailed description of site-specific construction activities associated with dam removal at Rush Meadows and Agnew dams is provided for each alternative in Sections 3.3 and 3.4, respectively. Refer to Section 3.5 for a description of construction activities associated with the Gem Dam retrofitting alternatives.

After establishment of the Base of Operations and construction area, the following construction activities will be implemented:

- Remove any hazardous material identified during on-site investigations completed during pre-construction activities, if applicable.
 - Hazardous material will be removed and contained consistent with federal and state regulations.
 - The material may be temporary stockpiled on-site in a designated location prior to transport by helicopter to the designated hazardous waste stockpile area at the Base of Operations.
- Install a cofferdam and water bypass system to dewater the work area upstream of the dam, as appropriate.¹

¹ Currently, the installation of cofferdams is proposed only for the Rush Meadows Dam and Agnew Dam alternatives. Retrofitting of Gem Dam is proposed to be primarily conducted from a barge in a partially filled reservoir (see Section 3.5 for more detail).

- Excavate sediment to expose the face of the dam, as necessary, to complete dam removal/retrofitting.
 - Excavation will be limited to locations with dry soils.
 - Clean sediment will be stockpiled on-site for later use during restoration activities, as applicable.
- Remove/trim the geomembrane liner along the upstream face of the dam, as necessary, to complete dam removal/retrofitting.
- Complete Project-specific construction activities associated with dam removal/retrofitting using modern mechanical equipment.
- Transport material (debris) from the construction area to the Base of Operations.

3.2.4 Disposition of Other Project Facilities

3.2.4.1 Removal

Concurrent with dam removal/retrofitting construction activities, existing Project facilities deemed unnecessary for continued operation and maintenance of the Project will be demolished and removed as follows:

- Temporary scaffolding may be erected to support demolition of buildings (e.g., removal of roofing).
- If present, concrete foundations/pads will be broken into manageable pieces using either pneumatic hand tools or a hoe ram mounted on a small excavator.
- All debris will be placed into bags and transported by helicopter with a sling load to the Base of Operations stockpile area.
- Debris will be transported to the Benton Crossing Landfill or other approved disposal site.

3.2.4.2 Retention

Concurrent with dam removal/retrofitting construction activities, other Project facilities deemed necessary for continued operation and maintenance of the Project will be retained and rehabilitated, as appropriate.

Refer to Table 3-2 for a list of existing Project facilities designated for removal or retention associated with each of the Proposed Project alternatives.

3.2.5 Outreach Activities

The following outreach activities will be implemented for each Proposed Project alternative:

- Two years prior to initiation of construction SCE will:
 - Coordinate with the Forest Service and the National Park Service (NPS), as appropriate, regarding procedures for (1) notifying the public regarding Project activities; (2) issuing future wilderness permits to backcountry recreationists; and (3) evaluating/implementing trail closures and/or camping restrictions during construction.
 - Affected trails may include Rush Creek Trail, Clark Lakes Trail, Spooky Meadows Trail, and Weber Lake Trail (Map 3-1).
 - The Rush Creek Trail terminates at its junction with the Pacific Crest Trail/John Muir Trail, which is located approximately 1.2 miles southwest of Rush Meadows Dam (Map 3-1); therefore, notifications to hikers along the trail may be required.
 - Following determination of the need for trail or camping restrictions/closures, the Forest Service may issue a future Forest Order pursuant to 16 United States Code 551 and 36 Code of Federal Regulations (CFR) 261.50(a) and (b).
- One year prior to initiation of construction SCE will:
 - Conduct a town hall meeting at June Lake to provide an overview of the upcoming Project activities/schedule for local residents and business owners, local government officials, sheriff's department, resource agencies, Tribes, and members of the public. The meeting will provide an opportunity for stakeholders to ask questions and voice concerns.
- Annually, prior to initiation of construction/restoration activities, SCE will:
 - Conduct a town hall meeting at June Lake (as described above).
 - Coordinate with the Forest Service and NPS regarding communicating any trail or area closures associated with the Project to the public, including:
 - Preparation of fliers, if necessary, for distribution at Forest Service visitor centers (e.g., Bishop, Mono Lake, Lone Pine, and Mammoth).

- Posting of fliers, Forest Service Order(s), and associated maps at pertinent trailheads, Forest Service visitor centers (e.g., Bishop, Mono Lake, Lone Pine, and Mammoth), and the Forest Service website.
- Coordinate with Forest Service air operations regarding helicopter flights and proposed flight paths.

3.3 PROJECT-SPECIFIC APPROACH FOR DISPOSITION OF RUSH MEADOWS DAM

Pursuant to 18 CFR § 5.6(d)(2)(vi), this section describes the Project-specific approach for the disposition of Rush Meadows Dam, including the two alternatives under consideration:

- Full dam removal involving:
 - Demolition of the entire dam with all concrete and other debris transported via helicopter to the Base of Operations for disposal at an approved site (approximately 3,400 cubic yards).
- Partial dam removal involving:
 - Construction of a notch in the center of the Rush Meadows Dam, sized to pass the PMF (approximately 6,500 cubic feet per second [cfs]), without water impoundment.
 - The notch will be approximately 140 feet wide at an elevation of 9,378 feet.
 - Removal of the top 15 feet of the remaining dam sections.
 - Reuse of the demolished concrete (approximately 2,300 cubic yards) as fill material with preliminary slopes of 1.5H:1V on the upstream and downstream sides of the remaining left and right sections of the dam to provide stabilizing support.
 - A thin layer of shotcrete will be applied to the top of the fill sections to prevent erosion of the fill material and to provide a more consistent and controlled visual appearance of the finished modifications.
 - Minimal import of new fill materials or export of demolished concrete will be required.

Figure 3-2 shows the concept design for partial dam removal, subject to modifications in final design to reflect refined hydraulic calculations, topographic information, and structural engineering.

General construction activities that are common among alternatives are described in Sections 3.2. The following section provides a detailed description of the construction area, transport of personnel, and Project-specific construction activities.

3.3.1 Rush Meadows Dam Construction Area

The construction area will encompass areas upstream and downstream of Rush Meadows Dam (Map 3-2). The following detailed Project-specific information augments the general discussion of the establishment of the construction area and associated activities provided in Section 3.2. Each of these Project-specific features/activities are described below:

- Construction Area
 - Construction activities associated with full and partial dam removal will occur within a work area located upstream and downstream of Rush Meadows Dam.
 - Temporary bridges will be established adjacent to the dam to facilitate personnel and equipment transport across the Rush Creek channel, as appropriate.
- Staging Areas
 - One staging area will be established in the dry reservoir bed on the right bank near the dam (looking downstream) for construction storage, fuel storage, portable restrooms, construction offices, equipment staging, and laydown area.
 - Mule team staging areas will be located on the granite outcropping near Rush Creek Trail just south of the spillway and at the existing Frontier Pack Station Camp.
- Stockpile Areas
 - Hazardous materials will be stockpiled in the staging area located within the dry reservoir bed.
 - Material used to stabilize the dam (partial removal option only) will be stockpiled within the work area downstream of the dam.
 - Material to be transported off-site will be stored at the debris stockpile area located within the staging area.
- Worker Housing Area
 - Worker housing will be established approximately 0.25 mile from Rush Meadows Dam at the existing Frontier Pack Station Camp (currently operated under an existing SUP issued by the Forest Service). The camp will be maintained consistent with all SUP conditions. The camp will provide housing, kitchen facilities, and shower and restroom facilities for the workers.
 - An alternative approach will be to provide worker housing on the right bank of reservoir just upstream of the dam using pre-manufactured containers.

On-site facilities have the advantage of a more contained construction site and more secure cover from severe weather events over the entirety of the construction season.

- Food, camping, personal supplies, and garbage will be transported primarily by pack mules and, when necessary, by helicopter. Food and garbage will be stored in bear-proof containers.
- Sanitary facilities (i.e., port-a-johns) will be transported by helicopter to the camp. The number of facilities will be commensurate with the number of personnel at the camp. The port-a-johns will be replaced once per week. Secondary containment will be placed under the port-a-johns to contain any potential spills.
- Shower stations will be established consistent with the Frontier Pack Station SUP. Showers will have warm water heated by 1- to 5-gallon refillable propane tanks. Similar shower units are currently in use by the Frontier Pack Station elsewhere in the wilderness area.

3.3.2 Rush Meadows Dam Transport of Personnel

Transport of personnel to/from the construction area (including the worker housing area) is described below.

- Tram Access
 - Workers will use the Agnew Tram² located near Rush Creek Powerhouse for transportation to/from Agnew Dam. They will then board a barge/boat to cross Agnew Lake (if reservoir levels allow) or walk the Rush Creek Trail to the Upper Agnew Lake Boat Dock where they will board the Gem Tram. The Gem Tram terminates at Gem Dam.³ The workers will then travel on foot or by mule along Rush Creek Trail to/from the construction area/worker housing area.
- Mule Access
 - Workers may also be transported by mule between the Frontier Pack Station (located near Silver Lake) and the construction area via the Rush Creek Trail.

3.3.3 Rush Meadows Dam Project-Specific Construction Activities

After establishment of the work, staging, stockpile, and worker housing areas, the following Project-specific construction activities will be conducted. Refer to Section 3.2.3 for a description of general construction activities. In addition, this section also identifies

² Agnew Tram will be upgraded prior to dam retrofit/removal activities.

³ Gem Tram was damaged during high flows in 2017 and a portion of the tram was washed out. Prior to dam retrofit/removal activities, the tram will be repaired.

the duration of construction, volume of material, and helicopter and truck trips for each alternative.

3.3.3.1 Rush Meadows Dam Construction Activities

Common Activities among Alternatives

The following construction activities are common to the Rush Meadows Dam alternatives (full and partial dam removal):

- Remove the geomembrane liner covering the upstream face of the dam and properly dispose of off-site.
- Install and operate the reservoir dewatering and bypass system:
 - In the late fall/winter prior to each construction season, the low-level outlets (one 24-inch circular outlet and one 30-inch square outlet at Rush Meadows Dam) will be fully opened to reduce impoundment of water in Waugh Lake.
 - If inflow during the runoff season exceeds the capacity of the low-level outlets, water will be impounded in the reservoir, potentially up to the bottom of the spillway.
 - Work in the reservoir and on the upstream side of the dam will be initiated only after the reservoir is drained and the entire volume of the inflow can be passed through the low-level outlet, allowing the reservoir bed to dry.
 - Once the water is at minimum pool at the invert elevation of the low-level outlet, high-density polyethylene/polyvinyl chloride (HDPE/PVC) piping will be inserted through the low-level outlet, extending approximately 100 to 200 feet upstream and downstream of the dam.
 - A small cofferdam consisting of super sacks and/or sandbags will be constructed at the upstream end of the pipe to direct clean water from the reservoir, past the work area (dam), to Rush Creek.
 - Small portable pumps may be placed between the cofferdam and Rush Meadows Dam to remove any water from low spots or capture leakage water to maintain a dry work area. The water will be pumped to a settling basin located in the dry lakebed. “Clean” water will then be pumped into the low-level outlet pipe.
- Construct temporary bridges over Rush Creek to provide full access to both sides of the dam.

Full Dam Removal Activities

- Using modern equipment, a new opening at the base of the dam near the thalweg will be created to manage inflow and protect against job-site flooding.
- Scaffolding and modern mechanical equipment will be used to cut sections of the concrete dam into small, manageable blocks using self-contained hydraulic wire saws powered by 70-kW generators.⁴
 - The blocks will be temporarily placed at the base of the dam.
 - A mini-excavator mounted with a hydraulic hoe will collect each felled concrete block and break it into smaller pieces that are of proper size for helicopter transport. Confinement bags will be used, as necessary, to secure the concrete blocks and/or construction debris.
 - Helicopters will transport the concrete blocks and other construction debris to a stockpile area at the Base of Operations.

Partial Dam Removal Activities

- Using modern equipment, a new opening at the base of the dam near the thalweg will be created to manage inflow and protect against job-site flooding.
- Dam demolition will be performed as follows:
 - A large excavator from the upstream side of the dam will be used to break-up the concrete.
 - A medium-sized excavator on the downstream side of the dam will load the debris into tracked dump trucks (3-cubic-yard capacity).
 - The first material will be used as fill to create a haul road along the downstream side of the dam (the road will be removed after Project completion).
 - The remaining demolished concrete will be used as fill material with preliminary slopes of 1.5H:1V on the upstream and downstream sides of the remaining left and right abutments of the dam to provide stabilizing support.
 - A thin layer of shotcrete will be applied to the top of the fill sections to prevent erosion of the fill material and provide a more consistent and controlled visual appearance of the finished modifications.
- Minimal import of new fill materials or export of demolished concrete will be required.

⁴ Slurry water generated by the cutting process will be vacuumed into double contained, sealed barrels and flown off-site for disposal.

3.3.3.2 Construction Duration

The duration of construction for each Proposed Project alternative follows:

- Full dam removal—two construction seasons
- Partial dam removal—one construction season

The construction season will extend annually from approximately June 1 to October 31, depending on weather and snow conditions. Construction activities will be implemented 10 hours per day, beginning no earlier than 7:00 a.m., Monday through Saturday. A maximum of 8 to 12 workers will be at the construction area on each scheduled workday.

3.3.3.3 Volume of Material, Helicopter Trips, and Truck Trips

Table 3-3 provides an overview of construction activities associated with each Rush Meadows Dam alternative.

Table 3-4 provides an estimate of helicopter and truck trips (round trips [RT]) for each Rush Meadows Dam alternative by construction season and month.

3.3.3.4 Construction Equipment

Table 3-5 provides a preliminary list of the type and quantity of construction equipment necessary to support full and partial dam removal (including other associated Project facilities) at the Base of Operations and the construction area.

3.3.4 Rush Meadows Dam Project-Specific Restoration Activities

Restoration plans will be developed in collaboration with stakeholders during the relicensing process for inclusion in the Final License Application, including the following:

- Stabilization of areas upstream and downstream of the former dam site, as appropriate, to prevent erosion.
- Restoration of the Rush Meadows Dam work area, staging area, campsite, and areas where Project-support facilities were removed.
- Revegetation and stabilization of sediment in the former lakebed, as necessary.
- Reestablishment/stabilization of Rush Creek with the lakebed, as necessary.

Project-specific restoration activities will be initiated the year following completion of full/partial dam removal construction activities.

3.4 PROJECT-SPECIFIC APPROACH FOR DISPOSITION OF AGNEW DAM

Pursuant to 18 CFR § 5.6(d)(2)(vi), this section describes the Project-specific approach for disposition of Agnew Dam including two alternatives under consideration:

- Full dam removal involving:
 - Demolition of the entire dam with all concrete and other debris transported via helicopter to the Base of Operations for disposal at an approved site (approximately 2,200 cubic yards).
- Partial dam removal involving:
 - Demolishing the center three arches of Agnew Dam to pass the PMF (approximately 8,400 cfs) without any water impoundment.
 - The new opening will be approximately 120 feet wide at an estimated water surface elevation of 8,474 feet.
 - Reusing the demolished concrete (approximately 1,500 cubic yards) as fill material with preliminary slopes of 1.5H:1V on the inside of the remaining arches to provide stabilizing support.
 - A thin layer of shotcrete will be applied to the top of the fill sections to prevent erosion of the fill material and provide a more consistent and controlled visual appearance of the finished modifications.

Figure 3-3 shows the concept design for partial dam removal, subject to modifications in final design to reflect refined hydraulic calculations, topographic information, and structural engineering.

General construction activities that are common among alternatives are described in Sections 3.2. The following section provides a detailed description of the construction area, transport of personnel, and Project-specific construction activities.

3.4.1 Agnew Dam Construction Area

The construction area will encompass areas adjacent to Agnew Dam (Map 3-3). The following detailed Project-specific information augments the general discussion for establishment of the construction area and associated activities provided in Section 3.2. Each of these Project-specific features/activities are described below:

- Construction Area
 - Construction activities associated with full and partial dam removal will occur within a work area located upstream and downstream of Agnew Dam.

- Temporary bridge(s) will be established adjacent to the dam to facilitate personnel and equipment transport across the reservoir and downstream channel, as appropriate. A temporary bridge over Rush Creek downstream of the dam will be installed to provide access along the full length of the dam during the construction period.
- Staging Areas
 - Two staging areas will be established in the dry reservoir bed (elevation 8,474 feet) on the left and right bank near the dam for construction storage, fuel storage, portable restrooms, construction offices, equipment staging, and laydown areas.
- Stockpile Areas
 - Hazardous materials will be stockpiled in the staging areas located within the dry reservoir bed upstream of the dam.
 - Material used to stabilize the dam (partial removal option only) will be stockpiled within the work area downstream of the dam.
 - Material to be transported off-site will be stored at the debris stockpile area located within the staging areas.
- Worker Housing Area
 - The existing Agnew Cabin downstream of the dam will be used to accommodate up to two people and provide kitchen and bathroom facilities and/or emergency shelter for workers.
 - Primary worker housing will be located at hotels in the vicinity of the Project.
 - Food, personal supplies, and garbage will be transported primarily via the tram and/or pack mules. Food and garbage will be stored in bear-proof containers.
 - Sanitary facilities (i.e., port-a-johns) will be transported by helicopter to the construction site. The number of facilities will be commensurate with the number of personnel on-site. The port-a-johns will be replaced once per week. Secondary containment will be placed under the port-a-johns to contain any potential spills.
- Helicopter Landing Site
 - A helicopter landing site will be established in the staging area upstream of Agnew Dam (Map 3-3).

3.4.2 Agnew Dam Transport of Personnel

Workers will be transported to/from the construction area using the Agnew Tram (located near the Rush Creek Powerhouse) and/or using mules originating from the Frontier Pack Station (located near Silver Lake) via the Rush Creek Trail (Map 3-3).

3.4.3 Agnew Dam Project-specific Construction Activities

After establishment of the work, staging, stockpile areas, the following Project-specific construction activities will be conducted. Refer to Section 3.2.3 for a description of general construction activities. In addition, this section identifies the duration of construction, volume of material, and helicopter and truck trips for each alternative.

3.4.3.1 Agnew Dam Construction Activities

Common Activities among Alternatives

The following describes construction activities common to the Agnew Dam alternatives (full and partial dam removal):

- Remove the geomembrane liner covering the upstream face of the dam and properly dispose of off-site.
- Reduce water levels in the reservoir to the elevation of the natural lake:
 - In the late fall/winter/spring prior to the construction season, the 30-inch low-level outlet will be fully opened to manage water levels in Agnew Lake.
 - If inflow during the runoff season exceeds the capacity of the low-level outlet, water will be impounded in the reservoir, potentially up to the bottom of the notches in Arches No. 5 and No. 6.
 - Work in the reservoir and on the upstream side of the dam will only be initiated once the reservoir is drained and the entire volume of the inflow can be passed through the low-level outlet, allowing the reservoir bed to dry.
 - Inflow to Agnew Lake will be managed using storage of water in both Waugh Lake and Gem Lake and controlling outflow from Gem Dam.
- Install cofferdam and water bypass system:
 - Once water is at minimum pool at the invert elevation of the low-level outlet, HDPE/PVC piping will be inserted through the low-level outlet and extend to the upstream cofferdam.
 - A cofferdam consisting of super sacks and/or sandbags will be constructed at the upstream end of the pipe to direct clean water from the reservoir, past the construction area (dam).

- Small portable pumps may be placed between the cofferdam and Agnew Dam to remove any water from low spots or capture leakage water to maintain a dry work area. The water will be pumped to a settling basin located in the dry lakebed. “Clean” water will then be pumped into the low-level outlet pipe.
- Temporary bridge(s) will be constructed over Rush Creek to provide full access to both sides of the dam at all times.

Full Dam Removal Activities

- Scaffolding and mechanical equipment will be used to cut sections of the concrete dam into small, manageable blocks using self-contained hydraulic wire saws powered by 70-kW generators.⁵
 - The blocks will be temporarily placed at the base of the dam.
 - A mini-excavator mounted with a hydraulic hoe will collect each felled concrete block and break it into smaller pieces that are of proper size for helicopter transport. Confinement bags will be used, as necessary, to secure the concrete blocks and/or construction debris.
- Helicopters will transport the concrete blocks and all other construction debris to either:
 - The stockpile area at the Base of Operations for hauling to an approved disposal site, or
 - The stockpile area within the construction area at Agnew Dam or near Gem Dam, outside the wilderness boundary, for future recycling as part of Gem Dam retrofitting (Section 3.5). All stockpiled material designated for future recycling will be contained and stored consistent with Forest Service guidance to be developed during the relicensing proceeding.
 - Determination of the suitability of material for recycling will be based on historical borings (2010) and examination/testing by the contractor in coordination with a materials testing/geotechnical engineer and structural engineer during dam removal construction activities.

Partial Dam Removal Activities

- Dam demolition will be performed as follows:
 - A large excavator from the upstream side of the dam will break-up the concrete allowing removal of Arches No. 4 to No. 6 in the dry reservoir bed.

⁵ Slurry water generated by the cutting process will be vacuumed into double contained, sealed barrels and flown off-site for disposal.

- A medium-sized excavator on the downstream side of the dam will load the debris into tracked dump trucks (3-cubic-yard capacity).
- The first material will be used as fill to create a haul road along the downstream side of the dam (the road will be removed after Project completion).
- The remaining demolished concrete will be used as fill material with preliminary slopes of 1.5H:1V on the upstream and downstream sides of the remaining left and right abutments of the dam to provide stabilizing support.
 - A thin layer of shotcrete will be applied to the top of the fill sections to prevent erosion of the fill material and provide a more consistent and controlled visual appearance of the finished modifications.
- Minimal import of new fill materials or export of demolished concrete will be required.

3.4.3.2 Flowline Removal Activities

Concurrent with full or partial dam removal construction activities, the Agnew Dam Flowline will be removed from service as follows:

- Aboveground/partially buried sections of the flowline will be “excavated,” cut into manageable pieces, and transported to the Base of Operations using helicopters.
- Underground sections of the flowline will remain in place with any exposed opening capped in concrete.
- Anchor blocks will be demolished similar to a building foundation and the gabion baskets will be disassembled.
- All debris will be placed into bags and flown out by helicopter via sling load to the Base of Operations stockpile area.
- The area will be backfilled, returned to its natural grade, and stabilized to prevent erosion.

3.4.3.3 Construction Duration

The duration of construction for each Proposed Project alternative is as follows:

- Full dam removal—two construction season
- Partial dam removal—one construction season

The construction season will extend annually from approximately June 1 to October 31, depending on weather and snow conditions. Construction activities will be implemented

10 hours per day, beginning no earlier than 7:00 a.m., Monday through Saturday. A maximum of 8 to 12 workers will be at the construction area on each scheduled workday.

3.4.3.4 Volume of Material, Helicopter Trips, and Truck Trips

Table 3-6 provides an overview of construction activities associated with each Agnew Dam alternative.

Table 3-7 provides an estimate of helicopter and truck trips (RT) for each Agnew Dam alternative by construction season and month.

3.4.3.5 Construction Equipment

Table 3-8 provides a preliminary list of the type and quantity of construction equipment necessary to support full and partial dam removal (including other associated Project facilities) at the Base of Operations and the construction area.

3.4.4 Agnew Dam Project-Specific Restoration Activities

Restoration plans will be developed in collaboration with stakeholders during the relicensing process for inclusion in the Final License Application, including the following:

- Stabilization of areas upstream and downstream of the former dam site, as appropriate, to prevent erosion.
- Restoration of the Agnew Dam work area, staging area, and areas where Project-support facilities were removed (i.e., flowline).
- Revegetation and stabilization of sediment in the former lakebed, as necessary.
- Reestablishment/stabilization of Rush Creek with the lakebed, as necessary.

Project-specific restoration activities will be initiated the year following completion of full/partial dam removal construction activities.

3.5 PROJECT-SPECIFIC APPROACH FOR RETROFITTING GEM DAM

Pursuant to 18 CFR § 5.6(d)(2)(vi), this section describes the Project-specific approach for retrofitting of Gem Dam. The conceptual design goals for retrofitting of Gem Dam follow:

- Ensure structural performance/integrity—minimal damage during and after a large magnitude earthquake (>5,000-year event), such that no repair is expected to be required.
- Maintain hydraulic performance—spillway capacity capable of passing the PMF discharge without overtopping the dam.

SCE is not considering fully retrofitting Gem Dam to its original specifications and storage capacity. The preferred retrofitting alternative for Gem Dam to be evaluated in the Rush Creek relicensing includes the following:

- Removal of the upper portions of Arches No. 10 to No. 14 to develop a new ungated spillway with a crest elevation corresponding to the top of the existing gravity infill section, elevation 9,027.5 feet (consistent with current seismic restrictions).
 - The spill capacity will be equal to the estimated PMF (8,700 cfs).
- Removal of approximately the top 22 feet of the remaining dam arches, Arches No. 1 to No. 9, leaving an estimated 1.5 feet of freeboard to prevent overtopping during a PMF event.
- Removal of approximately the top 10 feet of the vertical piers between Arches No. 1 to No. 9.
- Use of the demolished concrete from construction as fill in Arches No. 10 to No. 14 to support the downstream chute of the new spillway.

Table 3-9 compares dam and reservoir characteristic under the original dam specification (existing project/seismic restrictions) and proposed retrofitting project. Reservoir storage under the retrofitting alternative will be reduced from the original capacity of 17,228 acre-feet (ac-ft) to 10,752 ac-ft (38% reduction).

Figure 3-4 shows the concept design for dam retrofit, subject to minor modifications in final design to reflect refined hydraulic calculations, topographic information, and more detailed structural modeling and engineering.

3.5.1 Gem Dam Construction Area

The construction area will encompass areas located upstream and downstream of Gem Dam (Map 3-4). The following detailed Project-specific information augments the general discussion for establishment of the construction area and associated activities provided in Section 3.2. Each of these Project-specific features/activities are described below:

- Construction Area
 - Construction activities associated with the dam retrofitting will occur within a work area located adjacent to the dam.
 - A temporary bridge will be established adjacent to the dam to facilitate personnel and equipment transport across the downstream channel, as appropriate.

- Staging Areas
 - One staging area will be established in the dry reservoir bed on the right bank near the dam for construction storage, fuel storage, portable restrooms, construction offices, equipment staging, and temporary docking facilities for the barge.
- Stockpile Areas
 - Hazardous materials will be stockpiled in the staging area located within the dry reservoir bed upstream of the dam.
 - Material used in retrofitting Gem Dam will be stockpiled within the work area downstream of the dam.
 - Material to be transported off-site will be stored at the debris stockpile area located in the staging area.
- Worker Housing Area
 - Worker housing will be established at (1) the existing Gem Bunkhouse (to be renovated prior to construction; capacity 12 to 15 workers); (2) the existing Gem Valve House and Cabin (capacity of 6 workers); and (3) Agnew Cabin, if necessary (capacity of 2 workers). Additional housing units will be established near the construction area, if necessary.
 - The existing Gem Cookhouse will be used to provide meals to the crew (to be renovated prior to construction). The existing kitchen facilities are expected to be adequate, but an additional kitchen container unit may be provided near the construction area, if needed.
 - Food, camping, personal supplies, and garbage will be transported primarily by pack mules and/or tram. Food and garbage will be stored in bear-proof containers.
 - Additional sanitary facilities (i.e., port-a-johns) will be transported by helicopter to the construction area. The number of facilities will be commensurate with the number of personnel on the job site. The port-a-johns will be replaced once per week. Secondary containment will be placed under the port-a-johns to contain any potential spills.
 - A mule staging area will be established near the construction area, if necessary.

3.5.2 Gem Dam Transport of Personnel

Transport of personnel to/from the construction area is described below.

- Tram Access
 - Workers will use the Agnew Tram⁶ located near Rush Creek Powerhouse for transportation to/from Agnew Dam. They will then board a barge/boat to cross Agnew Lake (if reservoir levels allow) or walk the Rush Creek Trail to the Upper Agnew Lake Boat Dock where they will board the Gem Tram. The Gem Tram terminates at Gem Dam.⁷
- Mule Access
 - Workers may also be transported by mule between the Frontier Pack Station (located near Silver Lake) and the construction area via the Rush Creek Trail.

3.5.3 Gem Dam Project-specific Construction Activities

After establishment of the work, staging, and stockpile areas, the following Project-specific construction activities will be conducted. Refer to Section 3.2.3 for a description of general construction activities. In addition, this section identifies the duration of construction, volume of material, and helicopter and truck trips for retrofitting of Gem Dam.

3.5.3.1 Gem Dam Construction Retrofitting Activities

The following describes construction activities for retrofitting of Gem Dam.

- Construction/retrofitting activities will occur primarily from upstream of the dam using a floating barge in a drawn-down reservoir with implementation of appropriate BMPs.
- The reservoir will be drawn down to an elevation of approximately 9,000 feet.
 - The reservoir water level during construction will be adjusted by controlling releases from the 36-inch low-level outlet, 36-inch bypass valve, and the flowline and by adjusting Waugh Lake storage and outflow from Rush Meadows Dam.

⁶ Agnew Tram will be upgraded prior to dam retrofit/removal activities.

⁷ Gem Tram was damaged during high flows in 2017 and a portion of the tram was washed out. Prior to dam retrofit/removal activities, the tram will be repaired.

- A floating barge equipped with a large excavator will be used to access the face of the dam for removal/adjustment of the existing geomembrane liner⁸ and for modification/retrofitting of the dam.
 - Construction will be completed using access primarily from the reservoir side to minimize potential for large pieces of demolished concrete material to fall into the drawn-down reservoir.
 - A catchment system along the upstream edge of the dam will be used to capture material before it enters the reservoir.
- The demolished concrete from construction of the new spillway, lowering of the remaining dam arches, and trimming of the vertical piers (approximately 10,200 cubic yards) will be used as infill to Arches No. 10 to No. 14 to support the downstream chute of the new spillway.⁹ Recycled material available from Agnew Dam will also be used as infill to Arches No. 10 to No. 14.¹⁰
 - The demolished concrete fill in Arches No. 10 to No. 14 will be compacted to a stable slope of approximately 1.5H:1V with a top layer of new reinforced concrete that will protect the fill material from scour and erosion during spill.
 - The concrete layer is expected to be formed into steps to improve energy dissipation of spill flow.

3.5.3.2 Construction Duration

The duration of construction associated with retrofitting of Gem Dam is as follows:

- Dam retrofitting—three construction seasons

The construction season will extend annually from approximately June 1 to October 31, depending on weather and snow conditions. Construction activities will be implemented 10 hours per day, beginning no earlier than 7:00 a.m., Monday through Saturday. A maximum of 12 to 18 workers will be at the construction area on each scheduled workday.

3.5.3.3 Volume of Material, Helicopter Trips, and Truck Trips

Table 3-10 provides an overview of construction activities associated with the Gem Dam retrofitting.

⁸ The existing geomembrane liner covering the upstream face of the dam will be modified during construction to accommodate the new dam face shape.

⁹ A small portion of the demolished material will initially be used as base material for a construction access route along the rough rock surface downstream of the dam. This material will be removed near the end of construction and used as infill to Arches No. 10 to No. 14 to support the downstream chute of the new spillway.

¹⁰ Suitable material from the disposition of Agnew Dam (full removal alternative only) will also be used as fill in Arches No. 10 to No. 14 to support the downstream chute of the new spillway.

Table 3-11 provides an estimate of helicopter and truck trips (RT) for Gem Dam retrofitting by construction season and month.

3.5.3.4 Construction Equipment

Table 3-12 provides a preliminary list of the type and quantity of construction equipment necessary for retrofitting of Gem Dam.

3.5.4 Gem Dam Project-Specific Restoration Activities

Restoration plans will be developed in collaboration with stakeholders during the relicensing process for inclusion in the Final License Application, including the following:

- Restoration of the Gem Dam work area, staging area, and areas where Project-support facilities were removed.
- Revegetation and stabilization of sediment in the former inundation zone, as necessary.
- Reestablishment/stabilization of Rush Creek within the former inundation zone, as necessary.

Project-specific restoration activities will be initiated the year following completion of the retrofitting construction activities.

3.6 POTENTIAL PERMITS AND APPROVALS ASSOCIATED WITH THE PROPOSED PROJECT ALTERNATIVES

The following identifies anticipated permitting requirements and authorizations necessary for the Proposed Project alternatives under consideration, including both construction and restoration activities:

- Rush Meadows Dam and Gem Dam Only
 - Wilderness Act Variance
- All Proposed Project Alternatives
 - Forest Service SUP (June Mountain Ski Area Parking Lot)
 - Potential Forest Order (trail closures)
 - United States Army Corps of Engineers Section 404 Clean Water Act Permit
 - State Water Resources Control Board Section 401 Clean Water Act Water Quality Certification
 - California Department of Fish and Wildlife Lake/Streambed Alteration Agreement

- State Water Resources Control Board Construction General Permit/SWPPP
- Northern Sierra Air Quality Management District, Rule 523, registration of portable equipment rated 50 brake horsepower or greater
- California Department of Transportation, Transportation Permits (e.g., Oversize/Overweight or Variance Permit)
- County Road Use Permit(s)

3.7 POTENTIAL ENHANCEMENT OF RUSH CREEK CHANNEL

The Proposed Project includes evaluating potential enhancement of the Rush Creek channel to address local flooding near SR-158 during high-runoff events (Map 3-5). An enhancement plan, if appropriate based on technical study results, will be developed in collaboration with stakeholders during the relicensing process for inclusion in the Final License Application.

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TABLES

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Table 3-1. Preliminary List of Construction Equipment at the June Mountain Ski Area Parking Lot

Equipment Description
Skycrane Helicopter, Heavy Lift (15,000-lb. load capacity)
Modified Black Hawk Helicopters, Moderate Lift (6,000-lb. load capacity)
A-Star 350, Light Lift Helicopter (2,500-lb. load capacity)
Helicopter Fuel Storage Tanks (including secondary containment)
K-rail Barriers (control access to landing sites)
20-foot Cargo Van
Office Trailers (one for SCE project management and one for contractor construction personnel)
25-kW Generators (two total—one for each office trailer)
Telehandler Forklift
Concrete Flight Buckets
Shipping Containers
Debris Boxes
Concrete Waste Bin
10-wheel Dump Truck
Water Tender (including minimum of 50 feet of hose)
Street Sweeper
Cat 313 Excavator
Cat 950 Loader
Sanitary Facilities (port-a-johns)
Security Kiosk
Fire Suppression Equipment and Fire Box
Type 6 Fire Engine (minimum 300-gallon capacity)

Notes: lb. = pound
kW = kilowatt

Table 3-2. Proposed Project Facilities

Proposed Project Facility		Remove	Retain
Rush Meadows Dam Area			
Dam	• Rush Meadows Dam	X	
Reservoir	• Waugh Lake	X	
Valve House	• Rush Meadows Dam Valve House	X	
Stream Gage	• Rush Creek below Rush Meadows (Waugh Lake) (USGS No. 10287262; SCE No. 359r)		X
Reservoir Gage	• Waugh Lake (USGS No. 10287260; SCE No. 359)	X	
Trail	• Rush Meadows Dam Access Trail	X	
Rush Meadows Dam/Waugh Lake Ancillary and Support Facilities	• Rush Meadows Dam Equipment Shed	X	
	• Rush Meadows Dam Gage House	X	
	• Rush Meadows Dam Solar Facility	X	
Gem Dam Area			
Dam	• Gem Dam		X
Reservoir	• Gem Lake		X
Flowline	• Gem Dam to Agnew Junction Flowline		X
Valve House	• Gem Valve House and Cabin		X
	• Gem Dam Arch 8 Valve House		X
	• Gem Flowline Valve House		X
Stream Gage	• Rush Creek below Gem Lake (USGS No. 10287281; SCE No. 352r)		X
Reservoir Gage	• Gem Lake (USGS No. 10287280; SCE No. 352)		X
Communication Lines	• Communication Line from Rush Creek Powerhouse to Gem Lake Dam		X
	• Communication Line from Gem Valve House to Arch 8 Valve House		X
	• Communication Line from Gem Tram Hoist House to Gem Valve House		X
Trams and Hoist Houses	• Gem Tram		X
	• Gem Tram Hoist House		X
	• Gem Tram Lower/Upper Landing		X

Proposed Project Facility		Remove	Retain
Trails	• Lower Gem Dam Access Trail		X
	• Gem Dam Arch 8 Access Trail		X
	• Upper Gem Dam Access Trail		X
Gem Dam/Lake Ancillary and Support Facilities	• Gem Lake Dock		X
	• Gem Lake Motor Barge		X
	• Gem Bunkhouse		X
	• Gem Outhouse		X
	• Gem Cookhouse		X
	• Gem Dam Compressor Shed		X
	• Gem Dam Storage Shed		X
	• Gem Dam Overhead Hoist House for Dam Length		X
	• Gem Dam Overhead Hoist House		X
	• Gem Fish Release Footbridge		X
	• Gem Tram Landing Footbridge		X
	• Gem Tram Bridge		X
	• Gem Weather Station		X
	• Gem Satellite Dish		X
	• Gem Solar Facility		X
• Gem Valve House Tunnel		X	
Agnew Dam Area			
Dam	• Agnew Dam	X	
Reservoir/Natural Lake	• Agnew Lake		X
Flowline	• Agnew Dam to Agnew Junction Flowline	X	
Valve House	• Agnew Junction (Valve House and Stand Pipe)		X
	• Agnew Dam Valve House	X	
Stream Gage	• Rush Creek below Agnew Lake (USGS No. 10287289; SCE No. 357)		X
Reservoir Gage	• Agnew Lake (USGS No. 10287285; SCE No. 351)	X	
Power Lines	• 4 kV Rush Creek Powerhouse to Agnew Dam Power Line		X
	• 4 kV Agnew Lake Dam Power Line	X	
	• 4 kV Upper Agnew Boat Dock Power Line (non-operational)	X	

Proposed Project Facility		Remove	Retain
Communication Line	<ul style="list-style-type: none"> • Communication Line from Agnew Hoist House to Agnew Boathouse 		X
Trams and Hoist Houses	<ul style="list-style-type: none"> • Agnew Tram 		X
	<ul style="list-style-type: none"> • Agnew Tram Hoist House 		X
	<ul style="list-style-type: none"> • Agnew Tram Landing 		X
Trail	<ul style="list-style-type: none"> • Agnew Stream Gage Access Trail 		X
Agnew Dam/Lake Ancillary and Support Facilities	<ul style="list-style-type: none"> • Lower Agnew Lake Boathouse/Dock 		X
	<ul style="list-style-type: none"> • Upper Agnew Lake Boathouse/Dock 		X
	<ul style="list-style-type: none"> • Agnew Lake Motor Barge 		X
	<ul style="list-style-type: none"> • Agnew Cabin 		X
	<ul style="list-style-type: none"> • Agnew Weather Station 	X	
	<ul style="list-style-type: none"> • Agnew Flume (downstream of Agnew Dam) 		X
Rush Creek Powerhouse Area			
Penstocks	<ul style="list-style-type: none"> • Agnew Junction to Rush Creek Powerhouse Penstock (No. 1) 		X
	<ul style="list-style-type: none"> • Agnew Junction to Rush Creek Powerhouse Penstock (No. 2) 		X
Powerhouse	<ul style="list-style-type: none"> • Rush Creek Powerhouse 		X
Gage	<ul style="list-style-type: none"> • Rush Creek Powerhouse (USGS No. 10287300; SCE No. 367) 		X
Transmission Line	<ul style="list-style-type: none"> • 2.4 kV Switchyard to Powerhouse Transmission Line 		X
Powerhouse Ancillary and Support Facilities	<ul style="list-style-type: none"> • Rush Creek Powerhouse Complex Access Road 		X
	<ul style="list-style-type: none"> • Cottages (2) 		X
	<ul style="list-style-type: none"> • Garages (4) 		X
	<ul style="list-style-type: none"> • Warehouse and Dock 		X
	<ul style="list-style-type: none"> • Machine Shop 		X
	<ul style="list-style-type: none"> • Pump House 		X
	<ul style="list-style-type: none"> • Woodsheds (2) 		X
	<ul style="list-style-type: none"> • Helicopter Landing Site 		X
	<ul style="list-style-type: none"> • Tank (propane) 		X
	<ul style="list-style-type: none"> • Bridge over Powerhouse Tailrace 		X
	<ul style="list-style-type: none"> • Bridge over Rush Creek 		X

Notes: kV= kilovolt
SCE = Southern California Edison
USGS = United States Geological Survey

Table 3-3. Overview of Construction Activities Associated with the Rush Meadows Dam Alternatives

	Full Dam Removal	Partial Dam Removal
Number of Construction Seasons	2	1
On-site Use of Demolition Material (cy)	0	2,286
Export of Demolition Material (cy)	3,351	0
Import of Concrete/Shotcrete (cy)	0	55
Helicopter Trips (RT)	1,426	150
• Heavy Lift	1,308	94
• Light Lift	118	56
Truck Trips (RT)	776	261
• Construction	419	245
• Disposal	357	16
Mule Trips (RT)	837	554

Notes: cy = cubic yards
RT = round trip

Table 3-4. Estimated Helicopter and Truck Trips Associated with the Rush Meadows Dam Alternatives by Construction Season and Month

Activity	Helicopter Trips ^{1,2}			Truck Trips ^{3,4}		
	Total Trips (RT)	Trips/ Construction Season	Trips/ Month	Total Trips (RT)	Trips/ Construction Season	Trips/ Month
Full Dam Removal						
Total	1,426	713	142.6	776	388	77.6
Partial Dam Removal						
Total	150	150	30	261	261	52.2

Notes: RT = round trip

¹ Helicopter trip calculations include construction operations only. Trips associated with restoration are not included.

² Helicopter trip calculations are based on estimated weight (pounds) of material.

³ Truck trip calculations include construction operations only. Trips associated with restoration are not included.

⁴ Truck trip calculations are based on estimated weight (pounds) of material.

Table 3-5. Preliminary List of Construction Equipment Associated with the Rush Meadows Dam Alternatives

Equipment Type	Example Make/Model	Quantity (No.)
Excavator, Large	CAT 340F	1
Excavator, Medium	CAT 330	1
Excavator, Mini	CAT 306	1
Tracked Dump	Panther T6	2
Mobile Crane	Grove 30 Ton	1
Concrete Batch Plant	EZ 1-1	1
Shotcrete Pump	Warrior 500	1
Water Pump	Honda WB2.0XT	1
Fuel Tank Trailer	Lee DT 975	1
Potable Water Tank	Norwesco 44115	1
Welder	Miller Bobcat 200	1
Container	job office	1
Container	tool unit	2
Work Platform	—	4
Temporary Bridge	40-foot shipping length	2

Table 3-6. Overview of Construction Activities Associated with the Agnew Dam Alternatives

	Full Dam Removal	Partial Dam Removal
Number of Construction Seasons	2	1
On-site Use of Demolition Material (cy)	0	1,515
Export of Demolition Material (cy)	2,243	0
Import of Concrete/Shotcrete (cy)	0	35
Helicopter Trips (RT)	988	110
• Heavy Lift	942	75
• Light Lift	46	35
Truck Trips (RT)	334	76
• Construction	95	63
• Disposal	239	13
Mule Trips (RT)	0	0

Notes: cy = cubic yards
RT = round trip

Table 3-7. Estimated Helicopter and Truck Trips Associated with the Agnew Dam Alternatives by Construction Season and Month

Activity	Helicopter Trips ^{1,2}			Truck Trips ^{3,4}		
	Total Trips (RT)	Trips/ Construction Season	Trips/ Month	Total Trips (RT)	Trips/ Construction Season	Trips/ Month
Full Dam Removal⁵						
Total	988	494	98.8	334	334	66.8
Partial Dam Removal						
Total	110	110	22	76	76	15.2

Notes: RT = round trip

¹ Helicopter trip calculations include construction operations only. Trips associated with restoration are not included.

² Helicopter trip calculations are based on estimated weight (pounds) of material.

³ Truck trip calculations include construction operations only. Trips associated with restoration are not included.

⁴ Truck trip calculations are based on estimated weight (pounds) of material.

Table 3-8. Preliminary List of Construction Equipment Associated with the Agnew Dam Alternatives

Equipment Type	Example Make/Model	Quantity (No.)
Excavator, Large	CAT 340F	1
Excavator, Medium	CAT 330	1
Excavator, Mini	CAT 306	1
Tracked Dump	Panther T6	2
Mobile Crane	Grove 30 Ton	1
Concrete Batch Plant	EZ 1-1	1
Shotcrete Pump	Warrior 500	1
Water Pump	Honda WB2.0XT	1
Fuel Tank Trailer	Lee DT 975	1
Potable Water Tank	Norwesco 44115	1
Welder	Miller Bobcat 200	1
Container	restroom/shower	1
Container	job office	1
Container	tool unit	2
Work Platform	—	2
Temporary Bridge	40-foot shipping length	2

Table 3-9. Gem Dam and Lake Specifications

	Existing (Seismic Restriction)	Post Retrofit
Dam		
Type	multiple arch (16 complete; 2 partial)	No change
Material	concrete	No change
Height (maximum)	84 ft	62 ft
Length	688 ft	No change
Volume	21,612 cy	21,612 cy
Elevation of Dam Crest	9,057.5 ft	9,035 ft
Spillway		
Type	Uncontrolled	No change
Upper Spillway Elevation	9,053.64 ft	9,027.5 ft
• Openings/Dimensions	5 openings / 5 ft wide x 2 ft high	Wide, ungated, free overflow spillway in Arches No. 10 to No. 14
Lower Spillway Elevation	9,051.63 ft	Removed
• Openings/Dimensions	8 openings/5 ft wide x 2 ft high	Removed
Capacity (maximum)	1,100 cfs	8,700 cfs
Reservoir		
Elevation at Maximum Operating Water Surface	9,027.5 ft	9,027.5 ft
Gross Storage	10,752 ac-ft	10,752 ac-ft
Area at Maximum Operating Water Surface	256 ac	256 ac

Notes: ac = acre
ac-ft = acre-feet
cfs = cubic foot/feet per second
cy = cubic yards
ft = feet

Table 3-10. Overview of Construction Activities Associated with Gem Dam Retrofitting

	Gem Dam Retrofitting
Number of Construction Seasons	3
On-site Use of Demolition Material (cy)	10,198
Export of Demolition Material (cy)	0
Import of Concrete/Shotcrete (cy) ¹	2,362
Helicopter Trips (RT)	1,752
• Heavy Lift	1,140
• Light Lift	612
Truck Trips (RT)	1,839
• Construction	1,664
• Disposal	175
Mule Trips (RT)	3,555

Notes: cy = cubic yards
RT = round trip

¹ The amount of import material currently does not reflect the import of recycled material from Agnew Dam for retrofitting of Gem Dam. The availability of recycled material from Agnew Dam will be determined pending future material examination/testing by a contractor in coordination with a geotechnical engineer and a structural engineer.

Table 3-11. Estimated Helicopter and Truck Trips Associated with Gem Dam Retrofitting by Construction Season and Month

Activity	Helicopter Trips ^{1,2}			Truck Trips ^{3,4}		
	Total Trips (RT)	Trips/ Construction Season	Trips/ Month	Total Trips (RT)	Trips/ Construction Season	Trips/ Month
Total	1,752	584	116.8	1,839	613	122.6

Notes: RT = round trip

¹ Helicopter trip calculations include construction operations only. Trips associated with restoration are not included.

² Helicopter trip calculations are based on estimated weight (pounds) of material.

³ Truck trip calculations include construction operations only. Trips associated with restoration are not included.

⁴ Truck trip calculations are based on estimated weight (pounds) of material.

Table 3-12. Preliminary List of Construction Equipment Associated with Gem Dam Retrofitting

Equipment Type	Example Make/Model	Quantity (No.)
Excavator, large	CAT 340F	1
Excavator, medium	CAT 330	1
Excavator, mini	CAT 306	1
Tracked dump	Panther T6	2
Mobile crane	Grove 30 Ton	1
Track drill	IR ECM370	1
Boom man lift	Genie S-65 HF	2
Concrete batch plant	EZ 1-1	1
Water pump	Honda WB2.0XT	1
Fuel tank trailer	Lee DT 975	1
Potable water tank	Norwesco 44115	1
Welder	Miller Bobcat 200	1
Container	job office	1
Container	tool unit	2
Work platform	—	4
Barges (floats)	—	2
Skiff	—	1
Temporary bridge	40-foot shipping length	2

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FIGURES

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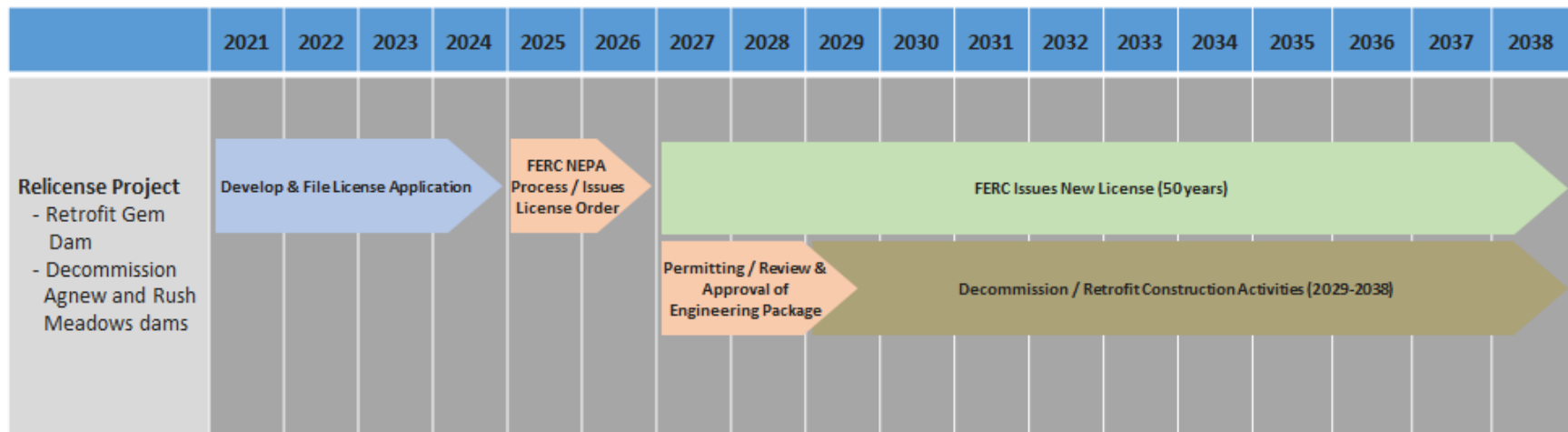


Figure 3-1. Draft Overview Schedule of Relicensing Process, Permitting, Decommissioning / Retrofitting Construction Activities

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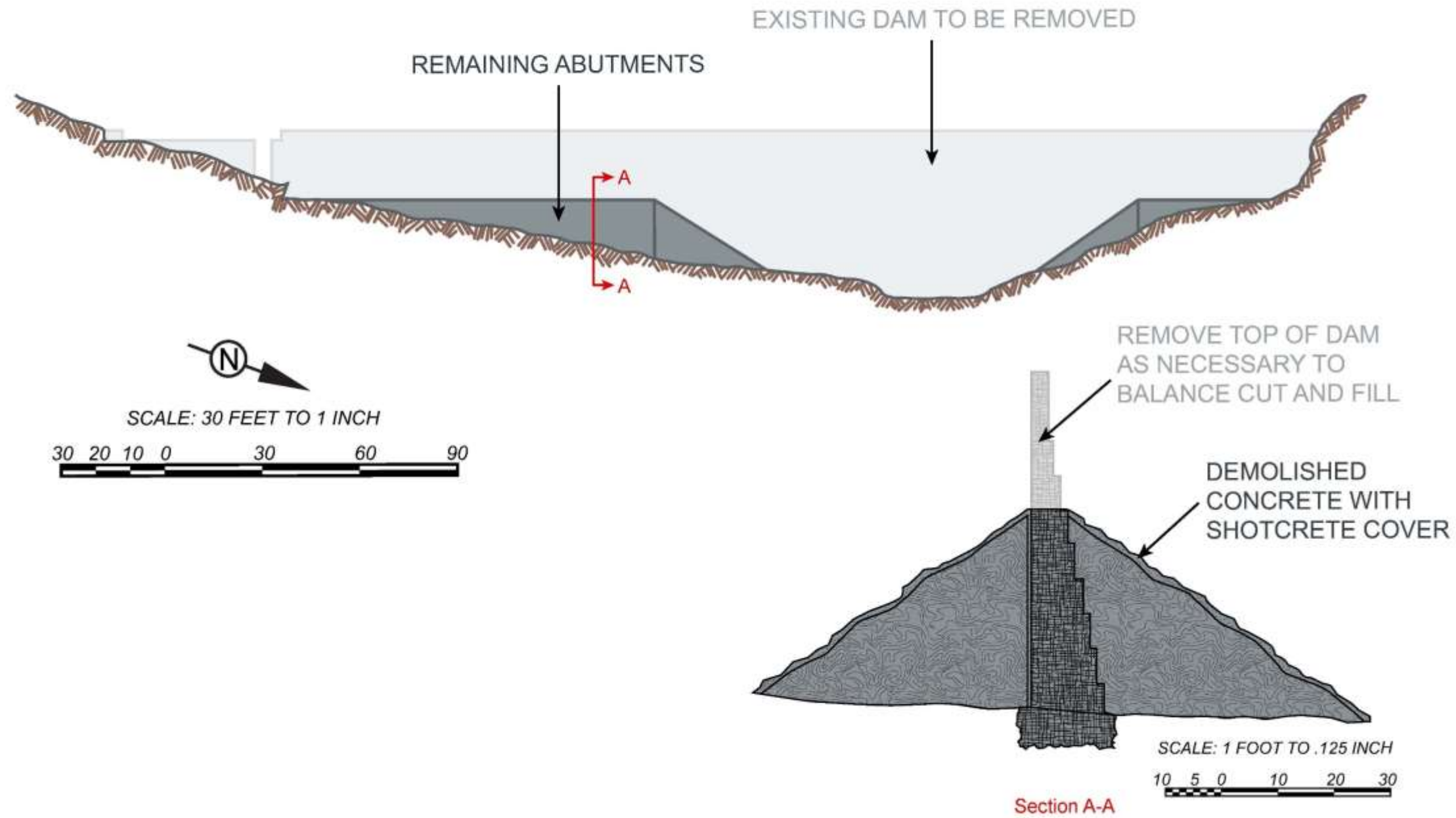


Figure 3-2. Cross Section of the Existing Rush Meadows Dam and Remaining Abutments Associated with the Partial Dam Removal Alternative

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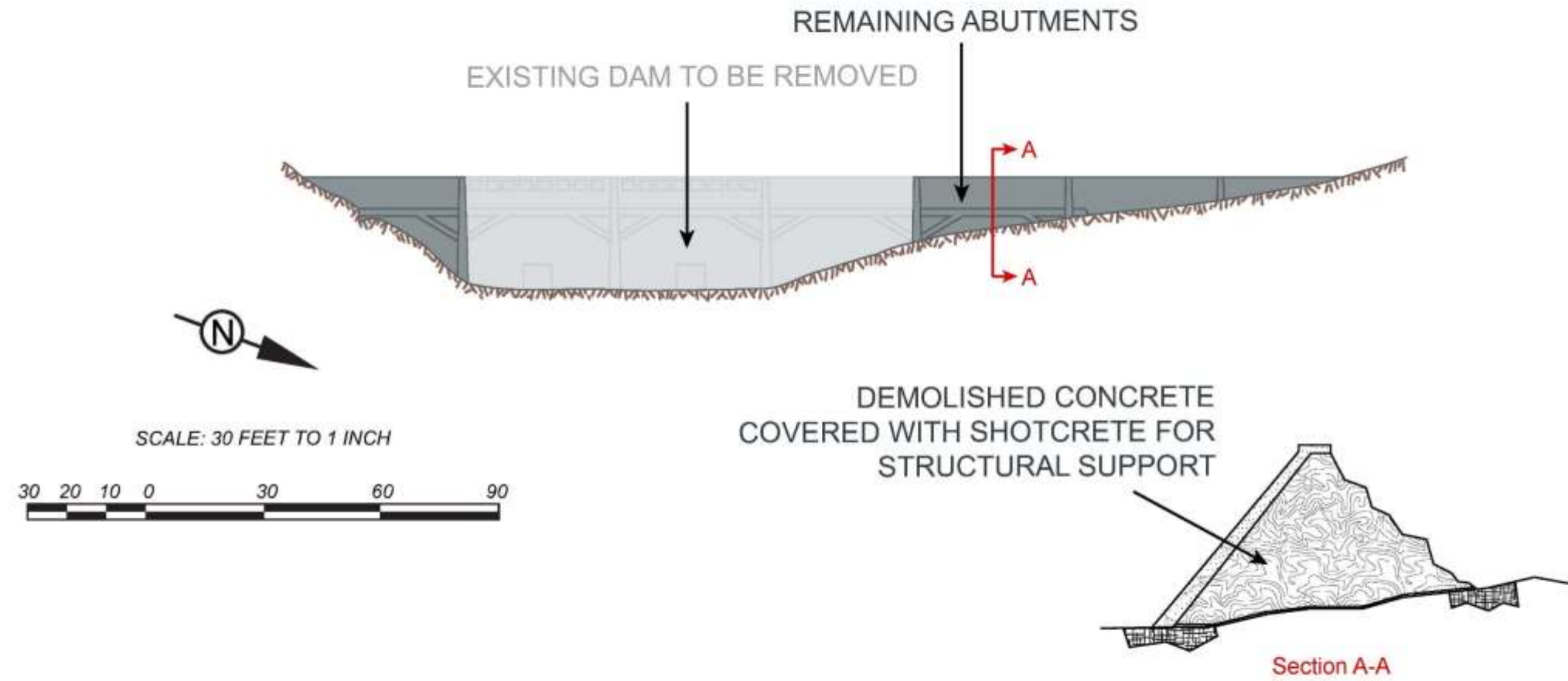


Figure 3-3. Cross Section of the Existing Agnew Dam and Remaining Abutments Associated with the Partial Dam Removal Alternative

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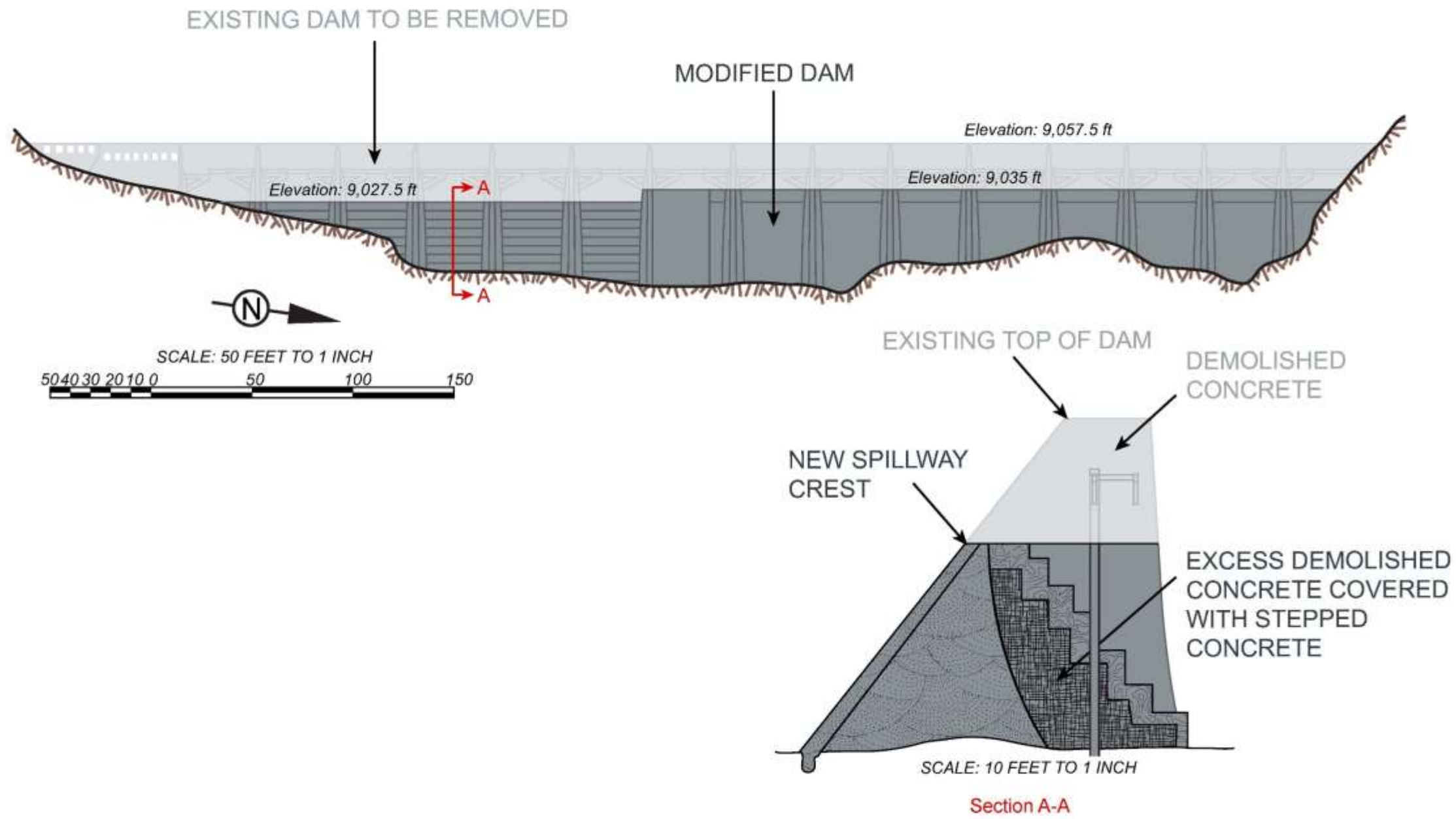


Figure 3-4. Cross Section of the Existing Gem Dam and Modified Dam Associated with the Gem Dam Retrofitting Alternative

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MAPS

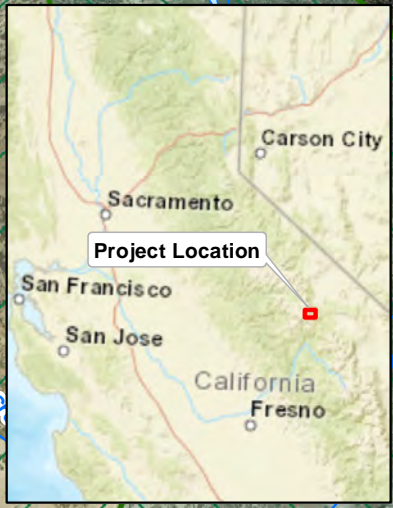
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- SCE Facilities**
- Dam
 - ▲ Powerhouse
 - Flowline / Penstock
 - + Tramway
 - FERC Boundary
- Other Features**
- Approximate Helicopter Flight Path
 - Highway
 - County Boundary
 - ~ Watercourse
 - Lake
 - Non-Project Trail
- Land Management**
- National Wilderness Area**
- Ansel Adams Wilderness
 - Owens River Headwaters Wilderness
- **NOTE:** Ansel Adams Wilderness and Owens River Headwaters Wildernes are located on USFS Lands

June Mountain Ski Area
Parking Lot
Base of Operations

Worker Housing
(Frontier Pack
Station Camp)






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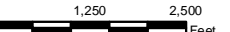
Rush Creek Project (FERC 1389)

Map 3-1

**Location of Base of Operations,
Flight Paths, and Recreation Trails**



Date: 8/23/2021

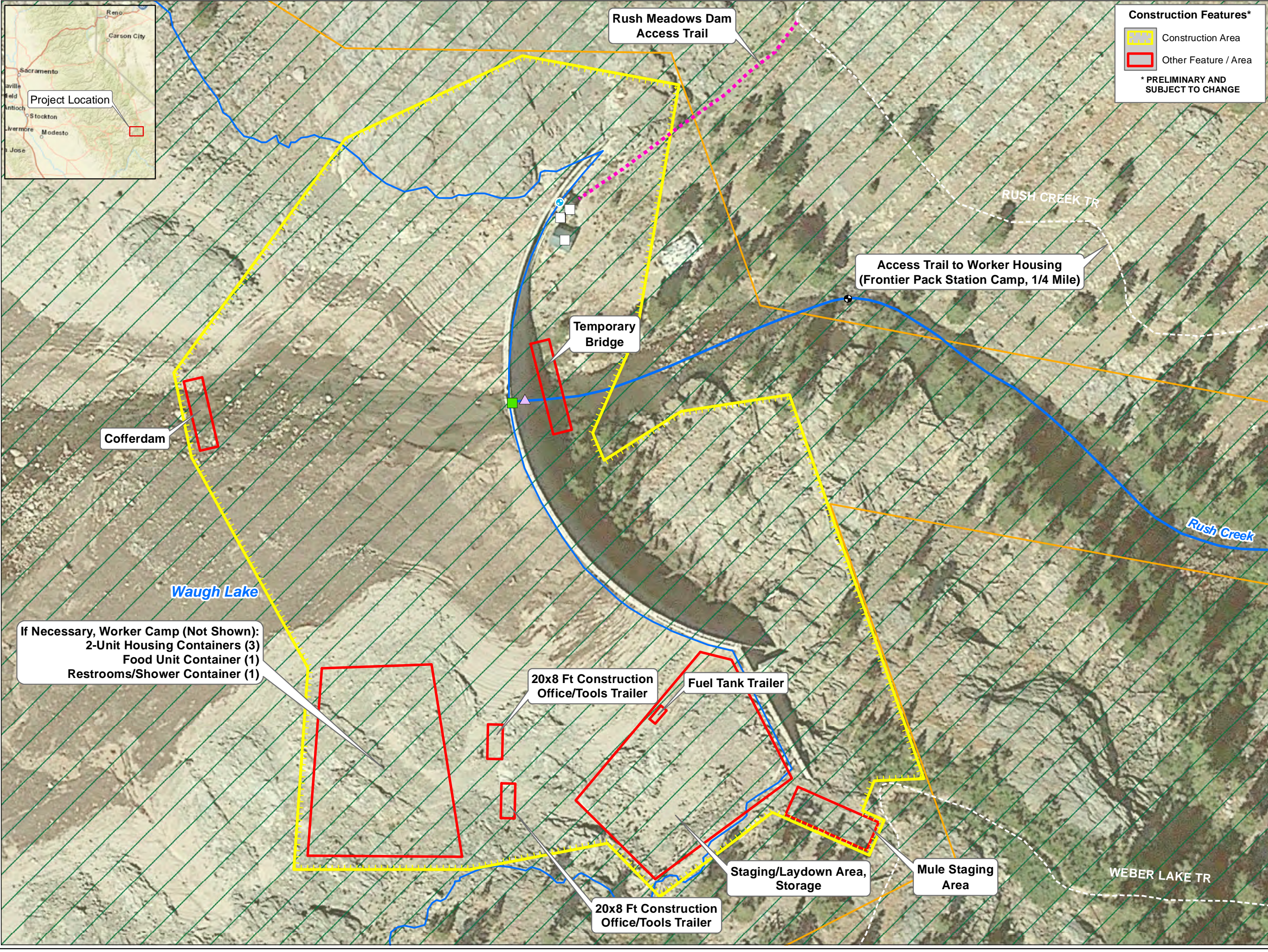


0 1,250 2,500 Feet

Projection: UTM Zone 11
Datum: NAD 83

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Construction Features*

- Construction Area
- Other Feature / Area

* PRELIMINARY AND SUBJECT TO CHANGE

SCE Facilities

- Dam
- Stream Gage
- Reservoir Gage
- Ancillary Facility
- Helicopter Landing Site
- Water Conveyance Feature
- Tailrace
- Flowline / Penstock
- Power Line
- Communication Line
- Transmission Line
- Tramway
- Project Road
- FERC Project Boundary
- Tunnel
- Lake

Other Features

- Watercourse
- Non-Project Trail

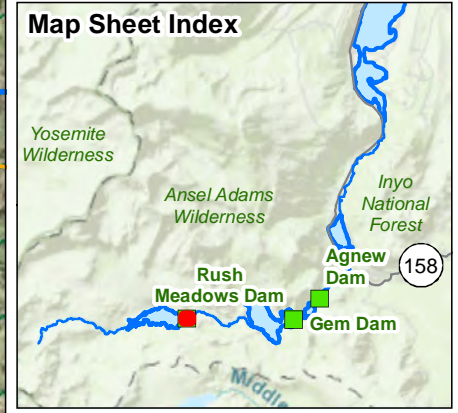
Land Management

National Wilderness Area**

- Ansel Adams Wilderness
- Owens River Headwaters Wilderness

**NOTE: Ansel Adams Wilderness and Owens River Headwaters Wildernes are located on USFS Lands

If Necessary, Worker Camp (Not Shown):
 2-Unit Housing Containers (3)
 Food Unit Container (1)
 Restrooms/Shower Container (1)



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Rush Creek Project (FERC 1389)

Map 3-2

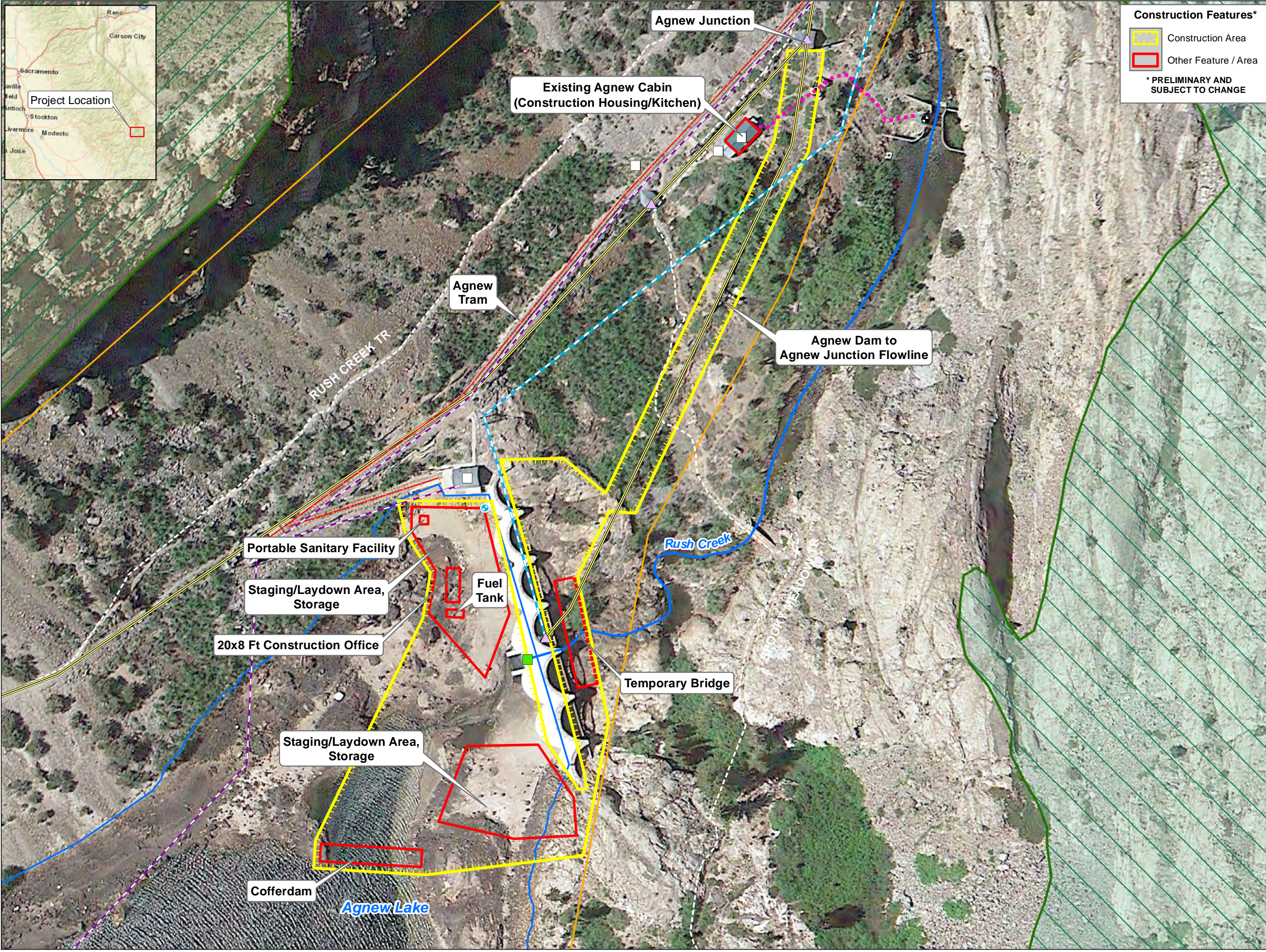
Rush Creek Project
Rush Meadows Dam Construction Area

Date: 8/23/2021

Projection: UTM Zone 11
 Datum: NAD 83

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Construction Features*

- Construction Area
- Other Feature / Area

* PRELIMINARY AND SUBJECT TO CHANGE

SCE Facilities

- Dam
- Stream Gage
- Reservoir Gage
- Ancillary Facility
- Helicopter Landing Site
- Water Conveyance Feature
- Tailrace
- Flowline / Penstock
- Power Line
- Communication Line
- Transmission Line
- Tramway
- Project Road
- Project Trail
- FERC Project Boundary

Other Features

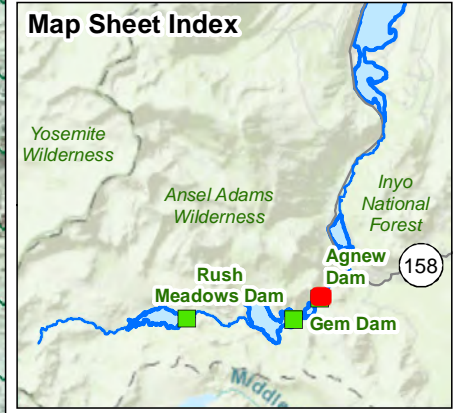
- Watercourse
- Lake
- Non-Project Trail

Land Management

National Wilderness Area**

- Ansel Adams Wilderness
- Owens River Headwaters Wilderness

**NOTE: Ansel Adams Wilderness and Owens River Headwaters Wildernes are located on USFS Lands



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Rush Creek Project (FERC 1389)

Map 3-3

Rush Creek Project
Agnew Dam Construction Area

Date: 8/23/2021

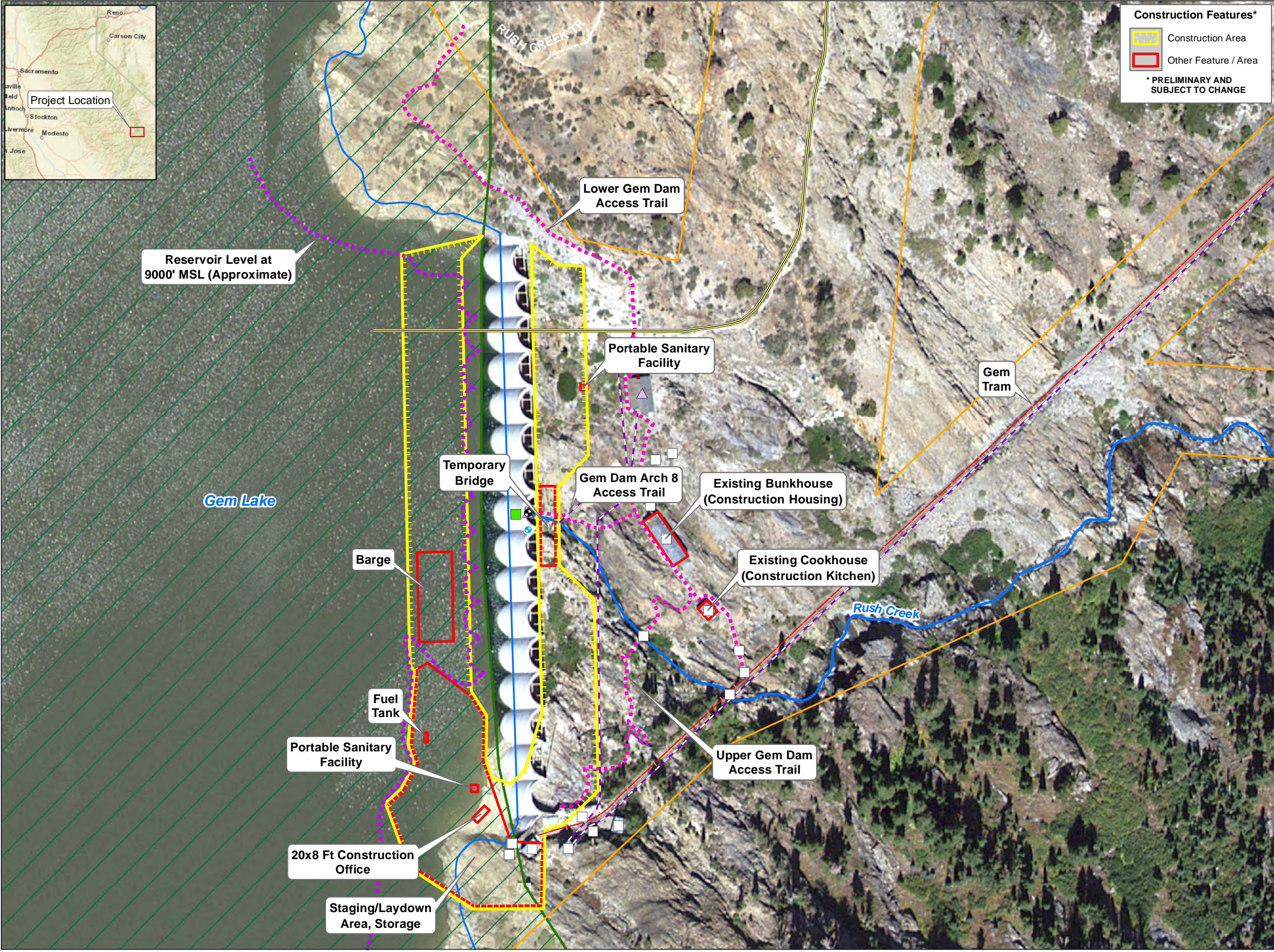
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Datum: NAD 83

Scale: 0 25 50 Feet

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Construction Features*

- Construction Area
- Other Feature / Area

* PRELIMINARY AND SUBJECT TO CHANGE

SCE Facilities

- Dam
- Stream Gage
- Reservoir Gage
- Ancillary Facility
- Helicopter Landing Site
- Water Conveyance Feature
- Tailrace
- Flowline / Penstock
- Power Line
- Communication Line
- Transmission Line
- Tramway
- Project Road
- Project Trail
- Tunnel
- FERC Project Boundary

Other Features

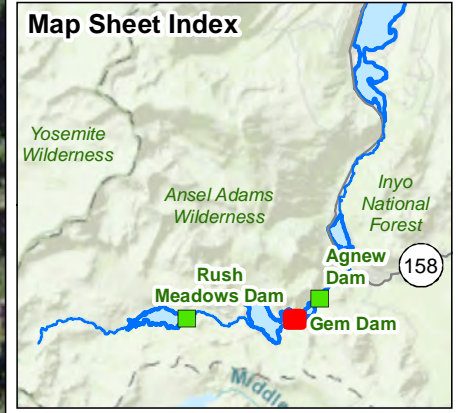
- Watercourse
- Lake
- Non-Project Trail

Land Management

National Wilderness Area**

- Ansel Adams Wilderness
- Owens River Headwaters Wilderness

**NOTE: Ansel Adams Wilderness and Owens River Headwaters Wilderness are located on USFS Lands



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Rush Creek Project (FERC 1389)

Map 3-4

Rush Creek Project
Gem Dam Construction Area

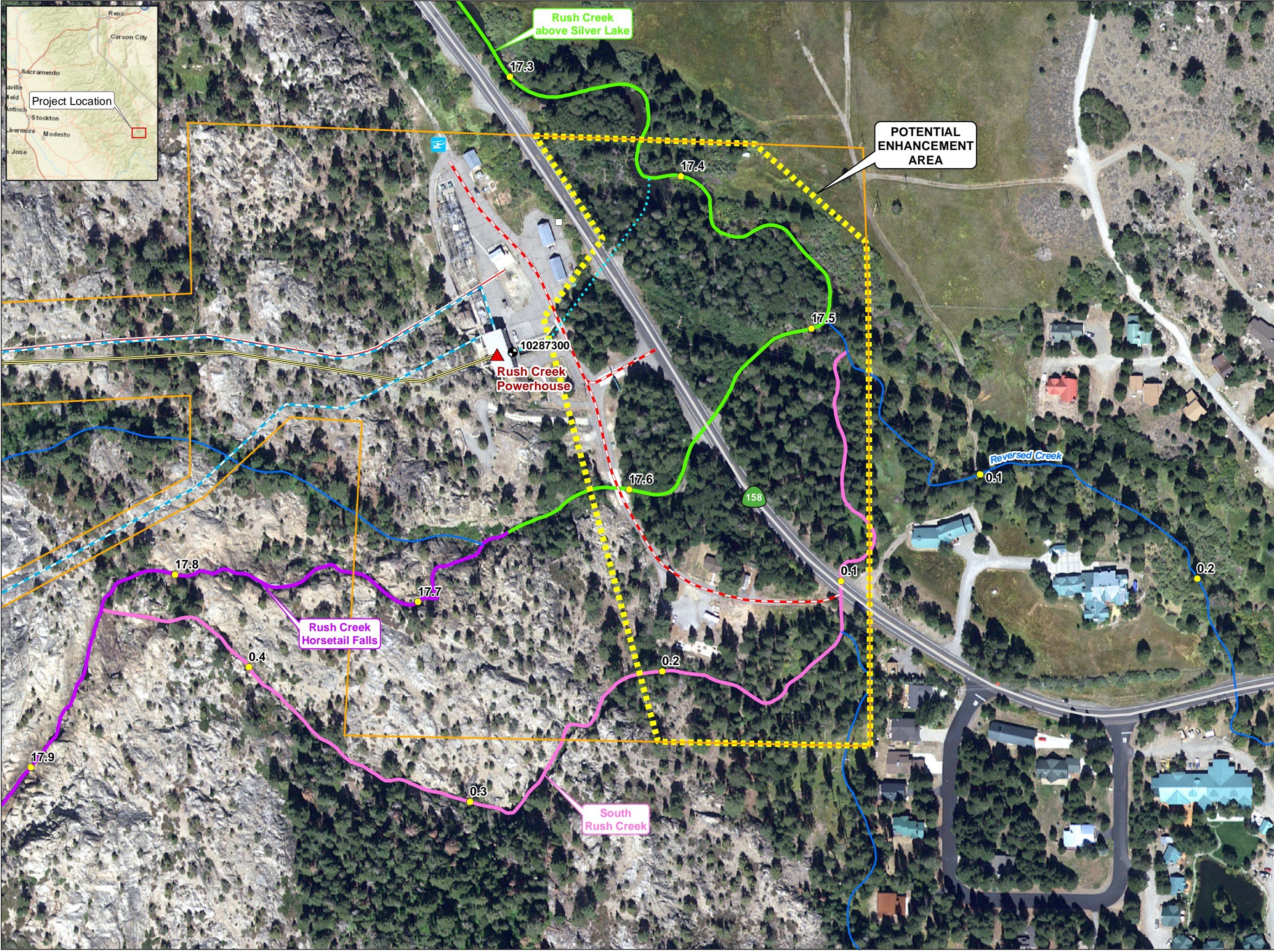
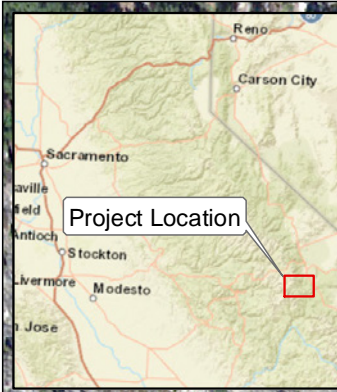
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Projection: UTM Zone 11
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Date: 8/23/2021

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- SCE Facilities**
- Powerhouse
 - Stream Gage
 - Ancillary Facility
 - Helicopter Landing Site
 - Tailrace
 - Penstock
 - Power or Communication Line
 - Tramway
 - Project Road
 - FERC Project Boundary
- Other Features**
- Non-Project Watercourse
 - River Mile / 10th Mile
 - Potential Enhancement Area



Rush Creek Project (FERC 1389)

Map 3-5

**Rush Creek
Potential Enhancement Area**



Projection: UTM Zone 11
Datum: NAD 83

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