Draft Environmental Impact Report
SCH No. 2008061110

Upper Stone Canyon Reservoir Water Quality Improvement Project

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EXECUTIVE SUMMARY

ES.1 Introduction and Overview

This Environmental Impact Report (EIR) has been prepared by the Los Angeles Department of Water and Power (LADWP) to evaluate potential environmental effects that may result from development of the proposed Upper Stone Canyon Reservoir Water Quality Improvement Project (proposed project). It has been prepared in conformance with the California Environmental Quality Act of 1970 (CEQA) statutes (Cal. Pub. Res. Code, Section 21000 et seq., as amended) and implementing guidelines (Cal. Code Regs., Title 14, Section 15000 et seq., 2010). LADWP is the lead agency under CEQA.

Upper Stone Canyon Reservoir (Upper Stone Reservoir) is located approximately 0.5 miles south of Mulholland Drive in the Bel Air community of the City of Los Angeles. The project site is a component of the larger Stone Canyon Reservoir Complex (SCRC) property, which is owned and maintained by LADWP. To help ensure the quality, reliability, and stability of the City of Los Angeles drinking water supply, LADWP proposes to construct a new buried concrete-covered reservoir (buried reservoir) to replace the existing uncovered Upper Stone Reservoir. This would ensure compliance with updated United States Environmental Protection Agency (EPA) water quality standards and maintain required local water storage, both of which are primary objectives of the proposed project. The proposed project would provide essentially the same volume of storage as the existing reservoir, which has a total capacity of approximately 138 million gallons (MG). A maximum depth of 3 feet of topsoil would be placed over the buried reservoir, and shallow-rooting plant species typical of the canyon environment and surrounding area would be installed. A buried structure is the only means to allow for plant material to be established on top of Upper Stone Reservoir, thereby helping to restore the natural character of the reservoir site, which is a secondary objective of the proposed project. After completion of project construction, public access for passive recreation activities would be provided to the SCRC property. The recreation functions would be operated and maintained by the Los Angeles Department of Recreation and Parks (LADRP) and/or the Santa Monica Mountains Conservancy.

CEQA requires consideration and discussion of alternatives to the proposed project that would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project. In this regard, two alternatives, a floating cover and an aluminum cover were also reviewed in detail in this EIR. The floating cover alternative would result in the least significant adverse impact on the physical environment when, as required under CEQA, it is analyzed in relation to the existing environmental conditions at and surrounding the project site. Therefore, the floating cover alternative has been identified as the environmentally superior alternative among all the alternatives considered in detail (including the buried reservoir). Nonetheless, as established in CEQA, a public agency may still choose to approve a project that would cause significant environmental impacts if the benefits provided by the project cannot be met by alternatives and the agency determines that those benefits outweigh the reduction or avoidance of the impacts.

Lower Stone Reservoir will not be modified under the proposed project described in this EIR, and it will remain an uncovered reservoir filled with essentially raw water that will be used only in extreme emergency circumstances.

ES.2 Project Location and Setting

Upper Stone Reservoir is located approximately 0.5 miles south of Mulholland Drive between Roscomare Road and Beverly Glen Boulevard in the City of Los Angeles. The SCRC property is owned and maintained by LADWP. Upper Stone Reservoir itself is accessed from Mulholland Drive via a non-public road located approximately 1.5 miles east of the San Diego Freeway (Interstate [I] 405).

The existing Upper Stone Reservoir has a storage volume of approximately 138 MG at the high water elevation of 930 feet. It has a maximum depth of 49 feet and a surface area of approximately 14 acres at the high water elevation. Upper Stone Reservoir is approximately 1,600 feet long and approximately 600 feet wide at the maximum width, near the outlet tower at the southern end, tapering to approximately 330 feet wide, near the inlet at the northern end. Unlike Lower Stone Reservoir, with its unpaved and irregular edges, the materials and shape of Upper Stone Reservoir impart a clearly manmade appearance. Upper Stone Reservoir has continuous, straight edges and is teardrop in shape. The bottom and sides of the upper reservoir are paved with asphaltic concrete, which has been tinted to more closely match the color of the soil in the surrounding area. The water level in reservoir can fluctuate considerably, exposing more or less of the asphalt side walls. An 8-foot tall chain link fence encloses the entire reservoir, running along its perimeter. A 15- to 20-foot wide paved maintenance road is located around the perimeter of the reservoir. A 15-foot diameter outlet tower is located in the southwest corner of the reservoir, projecting to a height approximately 30 feet above the water surface at the high water elevation. The tower is connected to the perimeter road by an approximately 140-foot long footbridge.

The proposed project would be contained entirely within the boundaries of the approximately 750-acre SCRC property. Land uses surrounding the property are predominantly low- to very low-density residential. The northern portion of the SCRC, located just north of Upper Stone Reservoir itself, is included within the Outer Corridor zone of the Mulholland Scenic Parkway Specific Plan Area, which encompasses an area extending outward 0.5 miles from the road right-of-way. The specific plan has been designated to help preserve natural scenic values and enhance passive recreation opportunities along the Mulholland Drive corridor. The northwestern-most corner of the SCRC property, including the north entry gate to the property, is located within the Mulholland Scenic Parkway Specific Plan Area Inner Corridor, which extends outward 500 feet from the road right-of-way and within which greater restrictions on development activities apply.

ES.3 Project Objectives

The purpose of the proposed project is to maintain and improve the quality, reliability, and stability of the SCRC service area drinking water supply in order to continue to meet customer demand.

The primary project objectives related to this purpose are to:

- Comply with updated water quality standards enacted by the EPA and, by extension, the California Department of Public Health, including the Stage 2 Disinfectants and Disinfection Byproducts Rule (D-DBPR), which establishes new regulations related to the formation of potentially carcinogenic disinfection byproducts that may result from certain drinking water chemical disinfection processes, and the Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR), which establishes new regulations related to the presence of microbial pathogens in drinking water supplies.
- Preserve local water storage capability to maintain reliability and flexibility to meet the SCRC service area demand for drinking water at required distribution system pressures, including during emergency or planned outages of upstream supplies.

A secondary objective of the proposed project is to help restore the natural character of those portions of Stone Canyon involved in the project improvements, to the extent that this can be accomplished consistent with the achievement of the primary water quality and water storage objectives.

Stage 2 Disinfectants and Disinfection Byproducts Rule

Based on 1996 amendments to the Federal Safe Drinking Water Act, the EPA has promulgated the Stage 2 D-DBPR to balance the risks related to microbial pathogens (i.e., disease-causing bacteria, viruses, and parasitic protozoa), which are normally largely inactivated and/or removed from drinking water by disinfection and filtration, against the production of disinfection byproducts in drinking water, which result from chemical reactions involving the use of chlorine as a disinfectant. The treatment of drinking water with disinfectants is considered one of the most important public health accomplishments of the past century, and it has significantly reduced the incidence of serious waterborne diseases, such as typhoid and cholera. The most common method of disinfection has been the addition of relatively small amounts of chlorine to drinking water. However, due to advances in the ability to detect chemical compounds in water, it is now known that reactions between chlorine and the relatively small amount of natural organic matter present in even treated drinking water can form disinfection byproducts. These disinfection byproducts are volatile organic compounds, such as trihalomethanes and haloacetic acids, which have now been linked, when present at elevated levels in laboratory tests, to potential increased risks of certain types of cancer.

Currently, chlorine is used as a secondary residual disinfectant for water that has received primary treatment in the Los Angeles Aqueduct Filtration Plant, located at the Van Norman Complex in Granada Hills. In order to minimize the production of disinfection byproducts in accordance with the Stage 2 D-DBPR, LADWP intends to change over to the use of chloramines. Formed by a mixture of chlorine and ammonia, chloramines are less reactive than chlorine with natural organic matter. Chloramines will replace chlorine throughout the LADWP drinking water distribution system. This changeover to chloramines has already occurred in some drinking water service areas within the LADWP system.

Chloramines are much more stable than chlorine, providing a longer-lasting residual effect throughout the water delivery system and reducing the requirement for supplemental application along the water distribution route. Chloramines are not as potent as chlorine at killing microbial pathogens, but they still provide adequate disinfection to meet safe drinking water standards. This chloramination approach is consistent with EPA mandates to balance disinfection considerations with the requirement to reduce the level of chlorine-related disinfection byproducts in drinking water.

In addition to the disinfection byproducts regulated under the Stage 2 D-DBPR, the formation of bromate in the LADWP drinking water system has also become a concern related to the storage of treated drinking water in uncovered reservoirs. Like the trihalomethanes and haloacetic acids addressed in the Stage 2 D-DBPR, bromate is a chemical compound that has been linked, when present at elevated levels in laboratory tests, to increased risks of certain types of cancer. Bromate levels in drinking water are regulated by the California Department of Public Health. Bromate can be formed when naturally occurring bromide contained in source water interacts with chlorine in the presence of sunlight. The LADWP system-wide changeover to chloramines would also eliminate this potential interaction between bromide and chlorine that can create bromate.

However, field demonstrations conducted by LADWP have established that it is difficult in uncovered reservoirs to maintain the intended chloramine residual and optimal chlorine-to-ammonia ratio necessary to protect drinking water supplies. The demonstrations have indicated that chloramines degrade rapidly in open reservoirs, reducing residual disinfectant levels in drinking water. Chloraminated water supplies exposed to sunlight in uncovered reservoirs also then become susceptible to algae blooms. The application of additional chloramines to the reservoir after an algae bloom occurs has proven ineffective in reducing the large concentrations of algae contained in the bloom. The use of other chemicals, such as chlorine dioxide and copper sulfate, has also proven ineffective because of limitations on their allowable application rates. Adding chlorine, while more effective in controlling algae, would have the potential to generate disinfection byproducts, thereby defeating the intent of the Stage 2 D-DBPR that has prompted the change-over to chloramines.

Replacing the existing Upper Stone Reservoir with a buried reservoir would allow for the proper management of chloramine disinfectant levels and would prevent the exposure of the treated water to sunlight, which promotes the growth of algae. Because the system-wide changeover to chloramines is being implemented to comply with Stage 2 D-DBPR mandates (and to limit the potential formation of bromate), the ability to manage chloramine residual to safeguard drinking water supplies in the SCRC service area is an essential aspect of the proposed project and alternatives to the proposed project.

Long Term 2 Enhanced Surface Water Treatment Rule

In conjunction with the Stage 2 D-DBPR, the EPA has also promulgated the LT2ESWTR to reduce the incidence of disease associated with certain pathogenic microorganisms that have the potential to exist in drinking water. This rule primarily addresses the treatment of drinking water that has surface water as its source, but it also applies to treated water stored in open reservoirs. The rule establishes limits for the presence of certain protozoan pathogens (especially Cryptosporidium) that cause gastrointestinal illness that can be severe or fatal for sensitive groups, such as the elderly, infants, or those with compromised immune systems. The LT2ESWTR requires that either uncovered treated-water reservoirs be covered to limit exposure to the environment and prevent recontamination or that water from uncovered treated-water reservoirs be re-treated before entering the distribution system.

The water treatment system currently used at the Los Angeles Aqueduct Filtration Plant adequately destroys and/or removes Cryptosporidium protozoa during treatment using a multiple-barrier system. This includes the use of ozone, which has been found to be effective at reducing Cryptosporidium levels, followed by the successive use of coagulation, flocculation, and biologically active rapid-rate deep-bed filters, which effectively remove most Cryptosporidium protozoa prior to discharge of the water from the plant. However, regardless of this primary treatment, the LT2ESWTR also includes provisions to ensure that downstream uncovered treated-water storage facilities, such as Upper Stone Reservoir, are managed to maintain the microbial protection of the treated water they receive before the water is discharged from the storage facilities and enters the distribution system. Treated water stored in uncovered reservoirs can be contaminated from numerous sources that could come in contact with the open water surface, including incidental surface water runoff, bird and animal waste, and airborne deposition (including pollutants and bacteria). Treatment at the point of discharge to comply with LT2ESWTR requirements, while not covering Upper Stone Reservoir, would contribute to the degradation of chloramine residual and the optimal chlorine-to-ammonia ratio necessary to maintain an appropriate disinfectant level in the drinking water supply. A solution that responds simultaneously to each water quality issue (i.e., the LT2ESWTR mandates and the maintenance of chloramine residual in relation to the Stage 2 D-DBPR mandates) is necessary. Therefore, it has been proposed that the existing uncovered reservoir be replaced with a buried reservoir to mitigate contamination risks. Compliance with the LT2ESWTR at Upper Stone Reservoir is an essential aspect of the proposed project and alternatives to the proposed project.

Local Water Storage Capability

Beginning in the 1970s, LADWP began efforts to address issues associated with the potential degradation of water quality at its 15 in-City uncovered water storage reservoirs. These reservoirs were dispersed throughout the water distribution system to provide critical local storage capability to meet fluctuations in demand within individual service areas and respond to situations when the primary upstream supply lines or facilities that feed the reservoir service areas may be temporarily out of service due to an unforeseen emergency or planned outage. To preserve this local storage capability while meeting increasingly stringent water quality requirements, a number of the smaller open reservoirs in the system have been covered or replaced with tanks.

In 1991, several of the largest reservoirs in the system, including Encino, Upper and Lower Hollywood, and Lower Stone Canyon, were determined by the California Department of Public Health, in accordance with the 1989 Surface Water Treatment Rule, to be susceptible to contamination from pathogens and pollutants contained in surface water runoff from adjacent hillsides. A number of options were considered to resolve the contamination concerns, including the installation of covers on the reservoirs and the disinfection and filtration of water as it was discharged from the reservoirs into the local distribution system. Based on many considerations, including extensive community involvement, cost and engineering concerns, the location and function of these reservoirs within the LADWP water supply system, and improvements being implemented to the City water distribution system, it was determined that to control potential contamination of the drinking water supply from surface water runoff, the four reservoirs mentioned above, including Lower Stone, should be removed from service as potable water sources.

Although these reservoirs remain in place, most treated drinking water that previously reached the reservoirs is now diverted to the distribution system, including other local storage tanks or reservoirs. Small filtration plants operate at some of the reservoirs to treat water that must be discharged to manage the reservoir water level and quality, but the reservoirs now provide storage for non-potable water that will be utilized as drinking water only during extreme emergencies. The removal of these larger reservoirs from service has eliminated approximately 8 billion gallons of treated water from the LADWP in-City storage system. The ability to continue to provide water to the service areas of these reservoirs was a key consideration in their removal from service. Underground tanks have been installed at the Hollywood Reservoir site to partially replace the lost local storage capacity of the upper and lower reservoirs. The storage offered by Encino Reservoir has become less critical because of extensive upgrades to the water distribution system in the San Fernando Valley that have established significantly greater flexibility and redundancy in providing drinking water to the former Encino Reservoir service area.

The centralization and reduction of water storage within the City has placed greater reliance on the fewer remaining facilities to meet fluctuations in demand and provide emergency storage within local service areas. While emergency supply for the SCRC service area would still be available from Lower Stone Reservoir, it would consist essentially of untreated raw water that would be chlorinated and distributed only in extreme emergencies when other supplies were exhausted; the distribution of water from Lower Stone Reservoir also would require a boil water notice to consumers. After such an emergency distribution, flushing and water quality testing of affected supply pipelines (potentially the entire SCRC service area distribution system) would also be necessary to purge the system of potentially unsafe water. The decision to remove Lower Stone Reservoir from service was based partially on the fact that Upper Stone Reservoir would continue to provide for the SCRC service area water demand.

Upper Stone Reservoir provides drinking water to approximately 450,000 people in a service area that includes Beverly Glen, West Los Angeles, Pacific Palisades, Marina Del Rey, and the Los Angeles International Airport vicinity. In the future, it will also provide secondary support for the Franklin Canyon Reservoir, Hollywood Reservoir, and Silver Lake Reservoir service areas through a planned connection to the recently constructed Stone-Hollywood Trunk Line. Installation of the new buried reservoir would maintain critical local supplies that provide drinking water to these service areas to respond to temporary losses of upstream sources related to a line rupture or other facility outage until repairs or interim operational modifications to circumvent the breakdown could be implemented. It would also provide flexibility to conduct scheduled maintenance of upstream supply facilities as required and still provide water to the SCRC service area at acceptable pressure levels, even though the inflow to the SCRC may be temporarily interrupted. The proposed project would provide essentially the same volume of storage as the existing Upper Stone Reservoir, which has a total capacity of approximately 138 MG. Maintaining local water storage capability in the SCRC service area to respond to emergencies and other outages is an essential aspect of the proposed project and alternatives to the proposed project.

In addition to providing crucial supplies during a temporary loss of upstream sources of water, Upper Stone Reservoir plays a critical role in maintaining local water supplies that help accommodate the often wide fluctuations in demand experienced in the SCRC service area on a daily basis. To maintain operational stability, the storage provided by Upper Stone Reservoir supplements water supplies during high-use periods when the outflow from the reservoir generated by customer demand exceeds inflow from upstream supply lines. Without the operational flexibility provided by the reservoir, this peak use in the SCRC service area would not be met solely by dependence on the distribution system and upstream supplies, which originate at the Van Norman Complex. Replacing the existing Upper Stone Reservoir with a buried structure as a means to achieve the Stage 2 D-DBPR and LT2ESWTR mandates would allow for the continuation of this critical role of providing operational stability to meet fluctuations in demand. Reliability and flexibility required to provide water during peak demand periods is an essential aspect of the proposed project and alternatives to the proposed project.

A buried reservoir would also increase the stability of the service area drinking water supply by eliminating evaporation from the surface of the existing open-air Upper Stone Reservoir. Based on the size of the upper reservoir and the general climatic conditions in the region, approximately 16 to 19 MG of water that would otherwise be lost to evaporation would be conserved each year by covering the reservoir. This volume of water would serve the average annual needs of approximately 100 to 120 households in the City.

Restore Natural Character of Portions of Stone Canyon

LADWP has worked with the Stone Canyon Subcommittee of the Coalition to Preserve Open Reservoirs (CPOR) for many years to help maintain community and environmental values in relation to facility improvements for both Lower and Upper Stone Reservoirs. The intent of this process has been to minimize permanent and temporary environmental impacts from construction and operations at the SCRC while still adhering to updated federal and/or state water quality regulations and continuing to provide adequate drinking water supplies to sections of the City. In relationship to the Upper Stone Canyon Reservoir Water Quality Improvement Project, some members of CPOR have played a primary role in promoting reservoir covering solutions that would help restore the natural character of those portions of the canyon involved in the project. Among the feasible methods to achieve the primary water quality and water storage objectives of the proposed project, a buried structure is the only means to allow for plant material to be established on top of Upper Stone Reservoir, thereby helping to restore the natural character of the site.

However, the concrete roof could only support a maximum of 3 feet of soil cover due to structural limitations. This would limit the type of plant material that could successfully establish on the buried reservoir because of the relatively shallow soil depth. Deep-rooting plants would also need to be avoided directly atop of or adjacent to the reservoir to limit potential structural damage to the reservoir walls or roof from root penetration. While several species common to the coastal sage scrub community of Stone Canyon are relatively shallow rooting and would be appropriate for planting atop the buried reservoir, other species also commonly found in the canyon, including some members of the chaparral and oak-walnut woodland communities, could not be planted. Because of the limited height profile and narrower species mix of the native plants that could be successfully established on the buried reservoir and because of the generally flat terrain of the upper reservoir site (as opposed to the steeper slopes of the surrounding canyon), the proposed project would not entirely replicate, either visually or biologically, the natural habitat of Stone Canyon. However, it would generally mimic the canyon environment, providing an area of lower-growing scrub vegetation, while essentially concealing the manmade elements of Upper Stone Reservoir.

ES.4 Project Description

As discussed above, to accomplish the objectives of the proposed project, the open-surface Upper Stone Reservoir would be replaced with a new buried concrete-covered reservoir. Other than manholes, hatches providing access to the interior of the buried reservoir, above ground vent structures, above ground electrical cabinets, and similar appurtenant facilities, water storage and distribution facilities would be essentially concealed underground after completion of construction. However, a paved road would still be required around the buried reservoir to provide vehicular access for maintenance and operations.

Certain constraints prevent the direct placement of a concrete roof over the existing Upper Stone Reservoir, which was constructed over 55 years ago. These constraints include the limited bearing capacity of the existing reservoir (i.e., the inability of the current reservoir and the sub-grade upon which it rests to support the load of the concrete roof system and the soil cover placed over the roof); and dam integrity and safety that could be compromised by penetrating the upstream side of the existing earth dam with numerous columns required to support the concrete roof. Therefore, to implement the proposed project, the existing Upper Stone Reservoir, including the inlet structure, outlet tower, and liner (the reservoir bottom and sides), would need to be demolished; the sub-grade beneath Upper Stone Reservoir would need to be stabilized to provide an adequate base to structurally support the buried reservoir; and a new perimeter concrete retaining wall would be required to support the concrete roof. The south segment of the new retaining wall would be located upstream of and functionally integrated with the existing earth dam, which would remain in place. The proposed buried reservoir would also require an impermeable liner and an extensive system of interior shear walls and columns to adequately support the roof and soil cover.

The combined weight of the buried reservoir, the water within the reservoir, and the soil layer atop the reservoir would exert tremendous downward force. If the areas below the proposed reservoir were not properly drained and water collected beneath, the upward force of buoyancy caused by the fluid pressure of the collected water could in turn damage the structure. Therefore, a sub-drain system would be installed beneath the buried reservoir liner to prevent water from collecting underneath. The water collected by the drain system would be directed to Lower Stone Reservoir.

The final footprint of the proposed buried reservoir would be slightly smaller than and contained within the footprint of the existing Upper Stone Reservoir, but because the side slopes and bottom would be reshaped to accommodate the required sub-grade drainage system, the total storage volume of the proposed buried reservoir would be slightly greater (by approximately 6 MG) than the existing reservoir.

Preliminary geotechnical analyses of the area surrounding Upper Stone Reservoir indicate that most areas are geologically stable and do not present a general concern relative to the proposed project. However, the slopes immediately east of the reservoir have experienced several relatively recent and moderately significant landslides (one in 1956 and two in 1969) that were caused by the adverse bedding of sedimentary layers resting on a clay soil plane. If a similar landslide were to occur in this area after the implementation of the proposed project, the buried reservoir could be seriously damaged. Because of the significant cost of the buried reservoir and because repairs necessitated by such a landslide event could remove the buried reservoir from service for a lengthy period and require major construction and investment, including entirely demolishing and rebuilding the reservoir, these potential landslide areas would need to be stabilized as part of the proposed project. The potential landslide areas encompass approximately 20 acres in three separate zones.

The proposed buried reservoir would be covered with a maximum of 3 feet of topsoil and planted with native species typical of the canyon environment and surrounding area. This would help fulfill the secondary objective of the project to restore the natural character of those portions of the canyon involved in the improvements required to meet the primary water quality and water storage objectives of the project. As mentioned above, a buried structure is the only means to achieve this restoration. Nonetheless, to achieve this objective, the proposed project would require a substantial financial investment (approximately $140 million over a 60-year life cycle, the large majority of which would be initial capital costs rather than long-term maintenance expenditures). This cost would essentially be borne by the citizens of Los Angeles, who provide revenue to LADWP through the purchase of drinking water. Based on this investment by LADWP ratepayers, under the proposed project, the benefits of Upper Stone Canyon would be made available to a broader segment of the population of the City rather than merely helping to restore the natural appearance and character of the canyon. In this regard, the proposed buried reservoir project is predicated on providing public access to Stone Canyon in the form of a pedestrian trails system. Public access to Stone Canyon is a component of the proposed project based on the public investment in the buried reservoir, but it is neither a primary nor secondary objective of the project. Furthermore, public access would not be a component of alternatives to the proposed project that would not provide some form of buried water storage facility.

To provide for public access at the SCRC, pedestrian trails would be created within portions of the property. However, the SCRC is and will remain an LADWP operational complex devoted to the storage, treatment, and distribution of drinking water supplies. In addition to Upper Stone Reservoir itself, facilities related to these functions include numerous chemical storage stations required to maintain water quality and distribution system integrity. These include the new chlorination station located west of Upper Stone Reservoir and several chemical storage stations located along the roadway that runs to the west of Lower Stone Reservoir. The recently completed water filtration plant is located south of the Lower Stone Reservoir dam, and a number of appurtenant facilities related to water storage and treatment are located throughout the SCRC, including a diversion structure just north of the upper reservoir. The Los Angeles Fire Department (LAFD) also maintains a helicopter landing area just north of the reservoir. The helicopter landing area includes a fire hydrant system to obtain water for aerial firefighting. In an action not related to the proposed project, this helicopter landing area will be relocated prior to the initiation of project construction to a site approximately 750 feet north of the upper reservoir, adjacent to the SCRC access road. Upper Stone Reservoir is not used to obtain water by helicopter for aerial firefighting. However, in certain circumstances the County of Los Angeles Fire Department may use Lower Stone Reservoir to obtain water by helicopter. No changes to Lower Stone Reservoir that would affect this capability are proposed under the Upper Stone Canyon Reservoir Water Quality Improvement Project. Public access to areas within the SCRC containing these facilities would create potential safety, security, hazards, and vandalism conflicts. In addition, the primary site access road entering the site at Mulholland Drive represents a potential safety conflict because it is relatively narrow and winding and is frequently used by large trucks to deliver materials and supplies related to water operations to the SCRC facilities. Furthermore, while no longer a treated water storage facility, Lower Stone Reservoir, because it was formed by damming a natural canyon, is characterized by deep water and steep embankments along its entire perimeter, creating a potential hazard if the public was given direct access to the area surrounding the reservoir. Therefore, public access to the SCRC would be limited to a trails system that would be segregated from the operational elements of the complex and Lower Stone Reservoir by new boundary fences.

The conceptual plans for public access would entail establishing a parking area along the east side of the SCRC access road at an existing relatively level pad located approximately 0.25 miles south of the Mulholland Drive access gate. Although this proposed location of the parking area would create some potential conflicts between private vehicles and LADWP vehicles sharing this segment of the road, it would minimize the requirement for extensive fill to create a flat pad for parking along the east side of the access road, which runs adjacent to a natural drainage course between the entry gate and the proposed parking area. With relatively minimal grading, off-road parking for approximately 25 vehicles could be provided at this location. A new gate would be installed on the road just southwest of the parking area to preclude access by all but LADWP-related vehicles. A new LADWP guardhouse would be located at this gate. The guardhouse at the existing Mulholland Drive gate would be removed, but a gate to prevent after-hours (between dusk and dawn) public access to the SCRC property would remain at Mulholland Drive. No other amenities would be provided in association with the public access function.

A trailhead would be established at the parking area, and a trail would cross generally eastward in the northern portion of the SCRC and proceed southward in the eastern portion of the SCRC property. A trail would also be established starting at the parking area and proceeding southward in the western portion of the property. Both the eastern and western trail segments would provide overlook opportunities of Lower Stone Reservoir, but, as discussed above, access to the lower reservoir itself would be unavailable. Trail segments also would be established on the buried Upper Stone Reservoir itself. Access to the buried reservoir surface would be available from the eastern trail segment because no crossing of the LADWP operations road, which runs along the west side of the reservoir, would be necessary. Conversely, access to the buried reservoir surface would not be available from the western trail segment because a pedestrian crossing of the LADWP operations road would be prohibited.

New boundary fences would be selectively located to restrict access to the road along both sides from the LADWP control gate south. The fences would encompass within the LADWP operations portion of the property certain facilities located north of the upper reservoir, including the diversion structure and the LAFD helicopter landing area. The boundary fence would also establish a buffer zone around the existing chlorination station. Additional segments of fencing would be installed to prevent access to Lower Stone Reservoir where natural topographic barriers were absent. This selective placement of security fencing would prevent public access to restricted areas but still allow for wildlife movement within the SCRC, especially continued access to the lower reservoir.

The exact placement and extent of the proposed trails system would be subject to a future planning and design process involving stakeholders such as LADWP, LADRP, the Santa Monica Mountains Conservancy, and members of the communities neighboring the SCRC.

ES.4.1 Reservoir Construction

Construction of the proposed project, as described in detail in Chapter 2, would take approximately 4 years to complete, and the analysis contained in this EIR related to potential environmental impacts caused by construction activity is based on this assumption. However, given the magnitude and the complex nature of project construction, and therefore the potential for unforeseen delays, the actual construction period may continue for up to 5 years. It is anticipated that construction activities would start in late 2015 and, assuming no major delays, would be completed in late 2019. For the purposes of estimating the calendar duration of the project and the monthly levels of activity related to personnel, truck deliveries, equipment operations, and earthwork, it has been assumed that, on average, 20 workdays would be available each month. This would generally account for holidays and rain days that would fall on weekdays and during which no construction activity would occur. Other than the delivery of materials and supplies to the site and the hauling of debris and excess soil from the site, all construction activities, including supplies laydown, soil excavation and stockpiling, equipment storage, and worker parking, would be confined within the SCRC boundaries. The general truck route during construction would be between I-405 and the north SCRC entry (at Mulholland Drive) via Skirball Center Drive and Mulholland Drive. No road closures are anticipated during construction, but traffic control measures, such as flag persons, may be required at times to facilitate construction vehicle ingress and egress at the SCRC gate. During construction, drinking water would continue to be provided to the SCRC from the Van Norman Complex in Granada Hills. It would be fed to the service area from the SCRC via the 60-inch line recently installed to bypass Lower Stone Reservoir. Water supplies would be further supplemented as necessary to help temporarily meet peak demand during construction (when Upper Stone Reservoir would be out of service) with additional purchases from the Metropolitan Water District.

Construction of the buried reservoir would consist of several tasks, including mobilization; demolition; landslide stabilization; excavation and reshaping of the reservoir sides and bottom; construction of the concrete perimeter retaining walls and interior shear walls; installation of the concrete liner; construction of the concrete roof columns and roof; backfilling around and above the reservoir; and landscaping above the new structure. Each of these tasks would require truck deliveries and/or haul trips and the operation of heavy equipment, including cranes, excavators, loaders, graders, dozers, and various types of trucks. Although the construction for the buried reservoir would be continuous, for descriptive purposes, tasks can be grouped together in phases based on the general timing of their occurrence and similarities in the type of work conducted. While the tasks and phases are generally sequential in that some must precede others at a given location, a certain amount of overlap would likely occur in different locations within the project site as construction proceeds.

ES.4.3 Project Operations

The new water storage facilities would not create the need for LADWP personnel to be located permanently on site. LADWP operations on site would involve maintenance of the reservoir, pipelines, and ancillary elements at a similar level of activity as current operations at Upper Stone Reservoir. These operations would generate minimal traffic to and from the site, similar to current levels.

The SCRC property would remain under the ownership of LADWP, which would continue to have the primary maintenance responsibilities at the site, but the operation and maintenance related to the trails access function would be the responsibility of LADRP and/or the Santa Monica Mountains Conservancy. The trails would be open to pedestrians only. Bicyclists could access the SCRC as far as the parking area, but no bicycles would be allowed on the trails themselves. Public access would be provided during daylight hours only, and the gate at the Mulholland Drive entrance to the site would be opened in the morning and closed at dusk. Formal picnic areas would not be provided. Smoking and any type of fires, whether a camp fire or the use of a cooking stove, would be prohibited. Informational and regulatory signage would be posted at the parking area and along the trails. No other amenities would be provided in association with the public access function. Parking would be provided for approximately 25 vehicles for trails users. The parking area would permit vehicles to be parked entirely off the road surface to minimize conflicts with LADWP delivery vehicles. Parking along the access road itself would be prevented with a combination of signs and barriers.

In order to assess potential environmental impacts related to public access at the SCRC, several assumptions have been made as follows regarding the anticipated level of visitor use of the trails system based on a maximum number of 25 parking spaces. Based on the availability of parking and on general neighborhood access, in comparison to other locations in the Santa Monica Mountains near Stone Canyon that offer similar recreation experiences (e.g., Franklin Canyon Park and Runyon Canyon Park, which are located approximately 3 and 5.5 miles east of Stone Canyon, respectively), the number of parking spaces that would be provided at the SCRC to support trail access would represent a limiting factor related to the number of visitors that might be expected. The level of use would vary between weekend days and weekdays. On weekend days, the average occupancy for vehicles would be 1.5 people. This would result in a peak use of about 38 visitors on site at a single time, assuming the parking area was fully occupied. However, the parking area would not be expected to be fully occupied throughout the day. Given the nature and size of the proposed trails elements, visitors would be expected to stay approximately 1 to 2 hours at the SCRC, and there would be a turnover of visitors leaving and entering the site during the day. Based on such factors as weather and holidays, the rate of this visitor turnover may vary considerably from weekend to weekend throughout the year, but an average rate of 2 full turnovers per weekend day has been assumed (i.e., 50 visitor vehicles would enter and leave the site during the day). Based on the assumed average vehicle occupancy of 1.5, this turnover rate would result in an average of 75 visitors per day at the SCRC on weekends. As on weekend days, the rate of visitor turnover on weekdays may vary considerably from week to week throughout the year, but the average turnover rate on a weekday is assumed to be half that of a weekend day (i.e., 25 visitor vehicles would enter and leave the site during the day). The average occupancy of vehicles would be greater than 1 but less than the 1.5 average for weekend days, resulting in an average occupancy of 1.25 people per vehicle. This turnover rate and vehicle occupancy would result in an average of 31 visitors per day at the SCRC on weekdays. Based on these factors, an average of approximately 16,000 recreation users would visit the SCRC on an annual basis.

ES.5 Issues Raised by the Public and Agencies

A scoping meeting was held at the Stephen S. Wise Temple in the Bel Air community of Los Angeles on July 14, 2008. The purpose of the meeting was to seek input from public agencies and the general public regarding the environmental issues and concerns that may potentially result from the proposed project. Approximately 60 people attended the scoping meeting. The following list summarizes the public comments or questions that were received at the scoping meeting:

- Why does LADWP need to comply with these water quality regulations? Why is LADWP reducing the amount of storage currently provided by Upper Stone Canyon Reservoir when California is only getting drier?
- Will an entry fee be charged for the public access?
- Will Lower Stone Reservoir still be filled with water?
- How much disturbance in the hillsides will be required to construct this project?
- Will the dust and air pollutants travel up the canyon?
- Only native plants should be planted on top of the buried tanks.
- What are the impacts to wildlife from the proposed project?
- Is the canyon a migratory corridor?
- Will construction of the project affect bird migration? Construction in the canyon has the potential to disturb reptiles and rattlesnakes.
- How old is the existing reservoir?
- LADWP should consider the impacts of moving large amounts of earth when there is periodic flooding and mudslides could occur. Disturbance in the hillsides could undermine the stability of other areas.
- Public access will lead to fires that will endanger the entire community.
- Construction activity could start a fire along the crest of Mulholland Drive.
- Would construction of the tanks hinder fire suppression activities?
- There is an echo effect on Woodfield Court. How much more noise would be generated by the proposed project?
- How will trucks make a left turn out of the project site onto Mulholland Drive?
- What will LADWP do to fix the deterioration of Mulholland Drive from all the heavy trucks?
- Would it be less expensive to cover the existing reservoir?
- LADWP should consider building a filter plant for Upper Stone Reservoir like the one completed for Lower Stone Reservoir.
- LADWP should consider above ground storage tanks.

In addition to the comments provided at the scoping meeting, 82 comment letters were received in response to the Notice of Preparation and Initial Study for this project. Copies of the comment letters are provided in Appendix A. The primary issues identified by the public and agencies included the following:

- What are the traffic impacts to I-405 and the freeway on- and off-ramps in the vicinity of the project site during construction?
- The EIR should include an assessment of flora and fauna within the SCRC, including rare plants and sensitive species.
- No watercourses should be impacted by the proposed project and avoidance of impacts to high quality habitat and sensitive plant and wildlife species should be a priority.

- The EIR should include a survey for Native American artifacts and remains, as well as contact local Native American representatives.
- The air quality analysis should include a human health risk assessment and determine impacts associated with localized significance thresholds.
- The proposed park use has the potential to create substantial traffic volumes on Mulholland Drive, as well as disturb natural habitat within the SCRC.
- The project site is located in a high fire hazard zone. Park uses within the project site could increase liability and potential property losses and danger in the event of a fire.
- Recreational use in the project site has the potential to increase the risk of fire and the associated dangers to nearby property owners, as well as park users.
- The EIR should consider alternatives that leave the site in its current condition, including bypassing the reservoir or storing water elsewhere.
- Recreation use has the potential to increase crime in the community by providing access to nearby homes.
- The cost of burying the reservoir is too high in comparison to other options that would cost less.
- Recreation use in the project site has the potential to hinder wildlife migration.
- How much noise will be created during operation of the site as a public park?
- The addition of a parking lot, restrooms, and other facilities for public access could have an aesthetic impact.
- Will removal of soil from the hillsides result in destabilization and create landslides?
- What are the impacts to air quality and human health during construction?
- The EIR should consider additional treatment options instead of covering the reservoir.
- Is it possible to mitigate noise, traffic, and air quality impacts that may arise during construction?
- What is the impact of covering Upper Stone Reservoir to wildlife that use the reservoir for water?
- The streets surrounding the SCRC should not be used for construction staging. All construction staging should occur within the SCRC.

ES.6 Summary of Environmental Impacts

An analysis of environmental impacts caused by the proposed project has been conducted and is contained in this EIR. Seven issue areas are analyzed in detail and presented in Chapter 3. Table ES-1 provides a summary of the potentially significant environmental impacts that would result during construction and operation of the proposed project, mitigation measures that would lessen potential environmental impacts, and the level of significance of the environmental impacts that would remain after implementation of the proposed mitigation. The proposed project would create significant and unavoidable impacts related to construction air quality (Chapter 3.2), operational wildland fire (Chapter 3.5), construction noise (Chapter 3.6), and construction traffic (Chapter 3.7). The EIR identifies potentially significant impacts requiring mitigation for biological resources (Chapter 3.3), cultural resources (Chapter 3.3), and operational traffic (Chapter 3.7). The EIR identified less than significant impacts for aesthetics (Chapter 3.1), operational air quality and greenhouse gas emissions (Chapter 3.2), and operational noise (Chapter 3.6). As discussed in Chapter 4, the proposed project would contribute to significant and unavoidable cumulative impacts related to air quality and traffic.

Table ES-1 Summary of Significant Impacts and Mitigation Measures

Potential Environmental Impacts	Significance Determination	Mitigation Measures	Level of Significance after Mitigation
AESTHETICS			
VIS-1: The proposed project would not have a substantial adverse effect on a scenic vista.	Less than significant	No mitigation measures are required.	Less than significant
VIS-2: The proposed project would not substantially degrade the existing visual character or quality of the site and its surroundings.	Less than significant	No mitigation measures are required.	Less than significant
AIR QUALITY			
AIR-1: During the construction phase, nitrogen oxides (NO_x), particulate matter less than 2.5 microns in diameter ($PM_{2.5}$), and particulate matter between 2.5 and 10 microns in diameter (PM_{10}) emissions would exceed the South Coast Air Quality Management District's significance threshold, and therefore, the proposed project would contribute to an existing or projected air quality violation.	Significant	**AIR-A** Heavy-duty equipment operations shall be suspended during first and second stage smog alerts. **AIR-B** Equipment and vehicle engines shall be maintained in good condition and in proper tune per manufacturers' specifications. **AIR-C** Based on a 2015 start of construction, all off-road construction diesel engines not registered under CARB's Statewide Portable Equipment Registration Program and that have a rating of 50 horsepower (hp) or more shall meet, at a minimum, the Tier 4 California Emission Standards for Off-Road Compression-Ignition Engines as specified in California Code of Regulations, Title 13, Section 2423(b)(1) unless such engine is not available for a particular item of equipment. In the event a Tier 4 engine is not available for any off-road equipment larger than 100 hp, that equipment shall be equipped with a Tier 3 engine. Equipment properly registered under and in compliance with CARB's Statewide Portable Equipment Registration Program shall be considered in compliance with this mitigation measure. **AIR-D** Electricity shall be utilized from power supply sources rather than temporary gasoline or diesel power generators, as feasible.	Significant

Table ES-1 Summary of Significant Impacts and Mitigation Measures

Potential Environmental Impacts	Significance Determination	Mitigation Measures	Level of Significance after Mitigation
		AIR-E Heavy-duty trucks shall be prohibited from idling in excess of 5 minutes, both on and off site, except as follows: • When verifying that the vehicle is in safe operating condition, or • When the vehicle is positioning or providing a power source for equipment or operations, or • While operating defrosters, heaters, air conditioning, or any other device to prevent a health or safety emergency.	
AIR-2: The proposed project would expose sensitive receptors to substantial pollutant concentrations of particulate matter (PM_{10} and $PM_{2.5}$) and toxic air contaminants (TACs) during construction.	Significant	See mitigation measures AIR-C through AIR-E above.	Significant
AIR-3: The proposed project would not generate greenhouse gas (GHG) emissions, either directly or indirectly, that would have a significant impact on the environment or conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases.	Less than significant	No mitigation measures are required.	Less than significant
BIOLOGICAL RESOURCES			
BIO-1: The proposed project would have a substantial adverse effect, either directly or through habitat modifications, on species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game (CDFG) or the U.S. Fish and Wildlife Service (USFWS).	Significant	**BIO-A** Prior to commencement of proposed project construction, a qualified restoration ecologist shall prepare a formal restoration plan to implement the replanting of walnut woodland and coastal sage scrub areas disturbed during project construction. Impacts to walnut woodland and coastal sage scrub communities shall be mitigated at a ratio of 3:1, and impacts to areas of disturbed walnut woodland and coastal sage scrub communities (i.e., low-quality habitat) shall be mitigated at a ratio of 1:1. These areas shall be replanted in areas	Less than significant

Table ES-1 Summary of Significant Impacts and Mitigation Measures

Potential Environmental Impacts	Significance Determination	Mitigation Measures	Level of Significance after Mitigation
		near or adjacent to the existing walnut woodland and coastal sage scrub communities. Implementation of the restoration plan shall occur within one year of completion of construction. A 3- to 5-year maintenance and monitoring program shall be conducted to ensure that a native plant cover is achieved and aggressive nonnative species do not out-compete the native species. **BIO-B** All coast live oak, southern California black walnuts, and western sycamores that are removed or otherwise impacted shall be replaced at a minimum 2:1 ratio of the same species with a minimum 15-gallon specimen measuring one inch or more in diameter at a point one foot above the base, and not less than 7 feet in height, measured from the base. **BIO-C** Prior to the start of construction, to minimize incidental impacts to adjacent vegetation, the construction contractor shall place construction fencing (chain link, silt fencing, or other fencing as appropriate) along the construction limits of work. The City of Los Angeles Department of Water and Power shall be responsible for hiring a qualified biologist to inspect the fencing upon installation and monthly thereafter for the duration of the project. The construction contractor shall be responsible for any improvements or repairs deemed necessary by the biologist. **BIO-D** Best management practices shall be employed during construction to assure that no discharge of debris, soil, sand, construction waste, cement or concrete washings, asphalt, paint, oil, or other harmful substances occurs in any potential nearby drainages. None of these materials shall be placed where they may run off into potential jurisdictional	

Table ES-1 Summary of Significant Impacts and Mitigation Measures

Potential Environmental Impacts	Significance Determination	Mitigation Measures	Level of Significance after Mitigation
		areas. Clean-up of all spills shall begin immediately. Stationary heavy equipment such as motors, generators, and welders shall not be placed in potential jurisdictional areas and shall have suitable containment to handle a spill or leak. **BIO-E** Activities associated with the proposed project, such as the use of construction vehicles and equipment may facilitate the spread of invasive and/or noxious weeds by inadvertently transporting the seeds or loose plant remnants on tires or the underside of equipment. A Weed Control Plan shall be prepared to minimize the spread of invasive and/or noxious weeds. The Weed Control Plan shall have a complete list of construction and restoration techniques and measures to be implemented to reduce the spread of noxious and invasive weeds. These measures shall include, but are not limited to: the locations of existing weed populations; measures to control introduction and spread of noxious weeds in the vicinity of Upper Stone Reservoir; worker training; inspection procedures for construction materials and equipment; post-construction monitoring for noxious weeds; and eradication and control methods. **BIO-F** Prior to the start of construction, a qualified biologist shall conduct focused pre-construction surveys for the coastal western whiptail and coast (San Diego) horned lizard in the areas to be disturbed by construction activities. If encountered, the species shall be relocated to an approved location based on consultation with the California Department of Fish and Game. In addition, a qualified biologist shall monitor construction activity within coastal sage scrub, chaparral, riparian, and	

Table ES-1 Summary of Significant Impacts and Mitigation Measures

Potential Environmental Impacts	Significance Determination	Mitigation Measures	Level of Significance after Mitigation
		walnut woodland communities to ensure that construction equipment and construction activities do not directly impact coastal western whiptail and coast (San Diego) horned lizard. Species that are observed during construction shall be relocated to an approved location based on consultation with the California Department of Fish and Game. **BIO-G** Project-related activities such as tree removal or vegetation clearance that would be likely to have the potential to disturb suitable bird nesting habitat shall be prohibited from February 15 through September 15 unless a qualified biologist surveys the construction area prior to disturbance to confirm the absence of active nests. Disturbance shall be defined as any activity that physically removes and/or damages vegetation or habitat. Surveys shall be conducted weekly, beginning no earlier than 30 days and ending no later than 3 days prior to the commencement of disturbance. If an active nest is discovered, disturbance within a buffer area surrounding the nest site shall be prohibited until nesting is complete; the buffer distance shall be determined by the biological monitor in consideration of species sensitivity and existing nest site conditions. Limits of the buffer area shall be demarcated with flagging or fencing. Once a flagged nest is determined to be no longer active, the biological monitor shall remove all flagging and construction activities may proceed. **BIO-H** Signs shall be posted near sensitive biological resources and sensitive habitat areas to educate the public to avoid disturbance to these resources. The Los Angeles Department of Water and Power shall post educational signage at trail heads emphasizing the protection of all natural features	

Table ES-1 Summary of Significant Impacts and Mitigation Measures

Potential Environmental Impacts	Significance Determination	Mitigation Measures	Level of Significance after Mitigation
		within the SCRC. **BIO-I** In conjunction with the City of Los Angeles Department of Recreation and Parks or the Santa Monica Mountains Conservancy, the Los Angeles Department of Water and Power shall develop and implement a management plan for operation of the public trails system. At a minimum, the plan shall include methods and provisions for: maintenance of the parking area and trails; invasive weed avoidance and removal; routine patrolling of the trails for litter pick up and inspection for vandalism, erosion, and other damage; and regular closure rotation of trails to minimize erosion and disturbance to habitat. **BIO-J** If at any time disturbance to a sensitive habitat area is suspected, the City of Los Angeles Department of Recreation and Parks or the Santa Monica Mountains Conservancy shall temporarily or permanently close the area for rest or restoration.	
BIO-2: The proposed project would not have a substantial adverse effect on riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by CDFG or USFWS.	No impact	No mitigation measures are required.	No impact
BIO-3: The proposed project would not have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.	No impact	No mitigation measures are required.	No impact

Table ES-1 Summary of Significant Impacts and Mitigation Measures

Potential Environmental Impacts	Significance Determination	Mitigation Measures	Level of Significance after Mitigation
BIO-4: The proposed project would not interfere substantially with the movement of native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.	Less than significant	No mitigation measures are required.	Less than significant
BIO-5: The proposed project would conflict with local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.	Significant	See mitigation measure BIO-B above.	Less than significant
CULTURAL RESOURCES			
CR-1: The proposed project would not cause a substantial adverse change in the significance of a historical resource.	Less than significant	No mitigation measures are required.	Less than significant
CR-2: The proposed project would cause a substantial adverse change in the significance of an archaeological resource.	Significant	**CR-A** Prior to the start of construction, LADWP shall hire a qualified archaeologist to conduct a construction worker briefing. The briefing shall focus on the types of resources that may be encountered during ground disturbing activities. Archaeological materials may manifest in the form of either prehistoric or historic artifacts. Construction workers shall be briefed on the requirements of CEQA Guidelines Section 15064.5 in the event that resources are encountered during ground disturbing activities. LADWP shall retain a qualified archaeological consultant prior to the start of construction to respond on an as-needed basis in the event that discoveries occur.	Less than significant
CR-3: The proposed project would not directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.	Less than significant	No mitigation measures are required.	Less than significant

Table ES-1 Summary of Significant Impacts and Mitigation Measures

Potential Environmental Impacts	Significance Determination	Mitigation Measures	Level of Significance after Mitigation
WILDLAND FIRE			
WILD-1: The public access component of the proposed project would expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.	Significant	**WILD-A** A park ranger shall be present on site at the SCRC during all operating hours and shall be responsible for unlocking and locking the public access gate at the Mulholland Drive entry to the SCRC. The ranger shall have the authority to enforce regulations and codes related to park use, detain individuals in violation of codes, and, if necessary, make arrests. The ranger shall be trained in peace officer standards, first aid, and fire fighting techniques. **WILD-B** Public access to the SCRC shall be prohibited during all red flag warning days as determined by the LAFD, normally considered days on which winds are in excess of 25 miles per hour and relative humidity is less than 15 percent. The Mulholland Drive public entry gate shall remain locked during red flag warning days, and a sign stating the reason for prohibiting entry shall be posted.	Significant
NOISE			
NOISE-1: Construction of the proposed project would result in a substantial temporary increase in ambient noise levels in the vicinity of the project site.	Significant	**NOISE-A** Traffic speeds on the interior site road shall be limited to 15 miles per hour or less. **NOISE-B** Delivery and haul truck activity, with the exception of concrete deliveries, shall be limited to between the hours of 8:00 a.m. and 5:00 p.m. to minimize disruption to sensitive uses.	Significant
NOISE-2: Operation of the proposed project would not expose persons to noise levels in excess of City standards.	Less than significant	No mitigation measures are required.	Less than significant
NOISE-3: Construction and operation of the proposed project would not expose people to excessive ground-borne vibration.	Less than significant	No mitigation measures are required.	Less than significant

Table ES-1 Summary of Significant Impacts and Mitigation Measures

Potential Environmental Impacts	Significance Determination	Mitigation Measures	Level of Significance after Mitigation
TRANSPORTATION/TRAFFIC			
TRANS-1: The proposed project would conflict with an applicable plan, ordinance, or policy for establishing measures of effectiveness for the performance of the circulation system at study intersections and on study roadway segments during construction.	Significant	**TRANS-A** During Phase 4 of construction, construction haul truck and construction delivery truck trips shall be scheduled to occur during the non-peak periods (defined as occurring between 9:00 a.m. and 4:00 p.m.), to the extent possible. **TRANS-B** Prior to construction, a construction traffic control plan shall be prepared for review and approval by the Los Angeles Department of Transportation. The plan may include such elements as advanced signage alerting motorists to construction and an increase in construction vehicle movements; construction speed limit signage along the haul route; and flag persons to control vehicle traffic at the SCRC gate.	Significant
TRANS-2: Construction activity would exceed the level of service standards established by the county congestion management agency for designated roads or highways.	Significant	See mitigation measure TRANS-A above. **TRANS-C** During construction, the construction contractor shall space truck trips destined to Interstate 405 to avoid caravans of trucks on the on- and off-ramps during the morning and evening peak hours.	Less than significant
TRANS-3: The proposed project would create a safety hazard during construction and operation associated with incompatible uses.	Significant	See mitigation measure TRANS-B above. **TRANS-D** Prior to the start of construction, and periodically during construction, as necessary, the construction contractor shall provide all construction drivers with safety training to minimize conflicts between construction activities and vehicles using Mulholland Drive. Training shall include adherence to posted speed limits, discussion of haul routes, and explanation of the construction traffic control plan. **TRANS-E** Prior to operation of the trails access function at the SCRC, warning signs shall be placed for eastbound traffic on Mulholland Drive approaching the SCRC gate to provide notice that vehicle turn movements are occurring.	Less than significant

Table ES-1 Summary of Significant Impacts and Mitigation Measures

Potential Environmental Impacts	Significance Determination	Mitigation Measures	Level of Significance after Mitigation
		TRANS-F Prior to operation of the trails access function at the SCRC, signage shall be installed along the SCRC interior site access road and at the intersection of the SCRC interior site access road with Mulholland Drive prohibiting left-turn movements onto Mulholland Drive except for Los Angeles Department of Water and Power vehicles.	
TRANS-4: The proposed project would not result in inadequate parking supply.	Less than significant	No mitigation measures are required.	Less than significant

ES.7 Alternatives to the Proposed Project

The CEQA Guidelines Section 15126.6 requires consideration and discussion of alternatives to the proposed project in an EIR. Several alternatives, including the No Project Alternative and numerous alternate project sites, were considered but rejected from consideration in this EIR, as discussed in Chapter 5 of this document. The two alternatives summarized below are reviewed in detail in Chapter 5.

ES.7.1 Floating Cover Alternative

Under the floating cover alternative, Upper Stone Reservoir would remain in basically its existing configuration, and an approximately 700,000-square-foot flexible membrane floating cover would be installed over the entire water surface and anchored to the edge of the reservoir basin above the top of water elevation. The floating cover would be larger in area than Upper Stone Reservoir itself at the high-water elevation to allow the cover to float on the water surface as the level of the water in the reservoir rises and falls. The cover would be a minimum of 45-mil thick and a maximum of 60-mil thick polypropylene or hypalon material. Although the reservoir liner and appurtenant facilities would be removed and replaced under this alternative, the reservoir would retain essentially its existing shape and volume (approximately 138 MG), providing local storage capacity for the SCRC service area essentially equivalent to the proposed project.

The floating cover would require a minimal amount of ground disturbance and a relatively low level of construction activity. It would be the least expensive means of covering the Upper Stone Reservoir water supply to achieve the LT2ESWTR and Stage 2 D-DBPR objectives of the proposed project (an estimated $35 million versus $140 million for the proposed project over a 60-year lifecycle). Floating covers require more maintenance, including replacement every 15 to 20 years due to deterioration, compared to a buried concrete reservoir, which has a projected lifespan of over 100 years. However, these additional maintenance and replacement costs have been factored into the total life-cycle costs reflected above. The floating cover alternative would require that Upper Stone Reservoir be removed from service for the least amount of time compared to the proposed project (approximately 1.5 years versus 4 years). Unlike under the proposed project, no landslide stabilization in the areas east of the reservoir would be included as part of the floating cover alternative because the cost of repairs and the downtime for the reservoir related to a potential landslide event are considered relatively low.

The floating cover alternative would not achieve the secondary objective of the proposed project to help restore the natural character of those portions of the canyon involved in the project improvements. As discussed in Chapter 2, public access to the SCRC would not be a component of the floating cover alternative.

Construction of this alternative would take approximately 1.5 years to complete. It is anticipated that construction activities would start in 2014 and be completed in 2015. Similar to the proposed project, the general truck route during construction would be between I-405 and the north SCRC entry (at Mulholland Drive) via Skirball Center Drive and Mulholland Drive. No road closures are anticipated during construction, but traffic control measures, such as flag persons, may be required at times to facilitate construction vehicle ingress and egress at the SCRC gate. During construction, water would continue to be provided to the SCRC from the Los Angeles Aqueduct Filtration Plant in Granada Hills. It would be fed to the SCRC service area via a 60-inch line recently installed to bypass Lower Stone Reservoir. Water supplies would be further supplemented as necessary to help temporarily meet peak demand during construction with additional purchases from the Metropolitan Water District.

As with the proposed project, the floating cover alternative would meet the two primary project objectives. It would comply with current water quality regulations and maintain local drinking water storage within the Upper Stone Reservoir service area. However, this alternative would not meet the secondary project objective of restoring the natural character of those portions of Stone Canyon involved in the project improvements.

The following summarizes the potential environmental impacts that would be created by the floating cover alternative compared to those that would be created by the proposed project.

Aesthetics

- Neither the floating cover alternative nor the proposed project would create a significant impact to a scenic vista.
- Neither the floating cover alternative nor the proposed project would create a significant impact by substantially degrading the existing visual character or quality of the site and its surroundings.

Air Quality

- The floating cover alternative, like the proposed project, would create significant and unavoidable regional air quality impacts during certain periods of the construction phase. However, the floating cover alternative would result in lower peak emissions and substantially lower emissions over the entire construction period compared to the proposed project.
- The proposed project would create a less than significant regional air quality impact related to post-construction project operations. Because the floating cover alternative would generate no additional post-construction traffic or maintenance activity at the SCRC from passive recreation use, it would create no impacts related to regional air pollutant emissions during post-construction operations.
- The floating cover alternative would result in similar peak localized air pollutant concentrations but lower peak TAC emissions during construction compared to the proposed project. However, the floating cover alternative, like the proposed project, would create a significant and unavoidable impact related to localized air pollutant emissions of PM_{10} and $PM_{2.5}$ during certain periods of the construction phase. It would result in substantially lower air pollutant concentrations and TAC emissions over the entire construction period. Unlike the proposed project, the TAC emissions would be less than significant under the floating cover alternative.
- The proposed project would create a less than significant impact related to localized air pollutant emissions and TACs during post-construction project operations. Because the floating cover alternative would generate no additional post-construction traffic or maintenance activity at the SCRC from passive recreation use, it would create no impacts related to localized air pollutant emissions or TACs during post-construction operations.
- Neither the proposed project nor the floating cover alternative would create a significant impact related to GHG emissions from either construction or operations. However, the floating cover alternative would create substantially lower GHG emissions during construction and operations when compared to the proposed project.

Biological Resources

- Unlike the proposed project, the floating cover alternative would not create significant direct impacts related to sensitive plant and wildlife species, nor would it conflict with local tree protection ordinances or impact migratory birds. No impacts to biological resources would occur.
- Unlike the proposed project, because no recreation activity at the SCRC would be provided, no long-term impacts to sensitive plant and wildlife species would occur during operation of the floating cover alternative.

Cultural Resources

- Unlike the proposed project, the floating cover alternative would not create significant impacts related to ground disturbing activities that have the potential to uncover previously unearthed archaeological resources because construction would be confined essentially to the existing reservoir footprint. The impact would be less than significant.
- Both the proposed project and floating cover alternative would have less than significant impacts to historic resources and paleontological resources.

Wildland Fire

- Unlike the proposed project, the floating cover alternative would not include public access within portions of the SCRC during post-construction operations. As such, there would be no increased risk of loss from wildland fire.

Land Use

- Unlike the proposed project, the floating cover alternative would require a zoning variance for the SCRC.

Noise

- Both the floating cover alternative and the proposed project would create a less than significant impact related to on-site construction equipment noise. However, both the proposed project and the floating cover alternative would create a significant noise impact associated with on-site haul truck trips. Even with implementation of mitigation measures NOISE-A and NOISE-B, the impact would remain significant and unavoidable. However, over the entire period of construction, the floating cover alternative would create less noise than the proposed project because of the nature and duration of the construction activities.
- Both the proposed project and the floating cover alternative would have a less than significant mobile noise impact associated with haul truck trips to and from the SCRC. However, the impact under the floating cover alternative would be less than under the proposed project because the duration of construction would be shorter and there would be fewer construction haul truck trips overall.
- The proposed project would create a less than significant impact related to noise during post-construction project operations. Because the floating cover alternative would generate no additional post-construction traffic or maintenance activity at the SCRC from passive recreation use, it would create no impact related to noise during post-construction operations.

Transportation and Traffic

- The floating cover alternative would create substantially fewer average and peak construction-related daily vehicle trips compared to the proposed project. Unlike the proposed project, the floating cover alternative would not create a significant impact related to level of service at the study intersections during construction.
- Both the floating cover alternative and the proposed project would create a significant impact to the level of service on the study roadway segments during construction. However, the floating cover alternative would create substantially fewer average and peak construction-related daily vehicle trips compared to the proposed project.
- Both the floating cover alternative and the proposed project would create significant impacts related to potential safety hazards to vehicles traveling on Mulholland Drive near the SCRC gate, primarily from trucks exiting the site. With the implementation of mitigation measures TRANS-D through TRANS-F, these impacts would be reduced to a less than significant level under both the floating cover alternative and the proposed project. However, the floating cover alternative would create substantially fewer average and peak construction-related vehicle trips compared to the proposed project.
- Because the floating cover alternative would not provide public access to the SCRC for passive recreation, the potential safety hazard at the Mulholland gate during the operations phase would be eliminated.
- Unlike the proposed project, the floating cover would not create a significant impact to CMP facilities in the project vicinity during construction.
- The proposed project would create a less than significant impact related to traffic and parking during post-construction project operations. Because the floating cover alternative would generate no additional post-construction traffic or maintenance activity at the SCRC from passive recreation use, it would create no impact related to traffic and parking during post-construction operations.

ES.7.2 Aluminum Cover Alternative

Under the aluminum cover alternative, Upper Stone Reservoir would remain in basically its existing configuration, and a lightweight aluminum cover would be installed over the entire surface of the reservoir. The aluminum cover structure would consist of a standing seam roof, situated several feet above the water surface, resting on concrete side walls. Although the reservoir liner and appurtenant facilities would be removed and replaced under this alternative, Upper Stone Reservoir would retain essentially its existing shape and volume (approximately 138 MG minus an insignificant volume lost to the roof support columns), providing local storage capacity for the SCRC service area essentially equivalent to the proposed project.

The aluminum cover would create less ground disturbance and require less construction activity than the proposed project. It would also be a less expensive means than the proposed project to cover the Upper Stone Reservoir water supply to achieve the LT2ESWTR and Stage 2 D-DBPR mandates (an estimated $80 million versus $140 million for the proposed project over a 60-year lifecycle). The aluminum cover would require approximately 3.5 years for construction compared to 4 years for the proposed project. The aluminum cover would be less durable than the buried reservoir, but still require relatively little maintenance or replacement of components. Similar to the floating cover alternative, the aluminum cover alternative would not achieve the secondary objective of the proposed project to help restore the natural character of those portions of the canyon involved in the project. Likewise, public access to the SCRC would not be a component of the aluminum cover alternative.

The slopes immediately east of the upper reservoir have experienced several relatively recent and moderately significant landslides. If a similar landslide were to occur in this area after the implementation of the aluminum cover alternative, the structure could be severely damaged. Because of the relatively significant cost of the aluminum cover and because repairs necessitated by such a landslide event could remove the reservoir from service for a relatively lengthy period and require major construction activity and investment, including entirely rebuilding the aluminum cover, the slopes east of the reservoir must be stabilized as part of this alternative, similar to the proposed project. The potential landslide areas encompass approximately 20 acres in three separate zones.

Columns would be necessary to support the aluminum cover, including some that would need to be located within the earth dam at the southern end of the reservoir. However, the relatively small number of columns that would penetrate the dam (approximately 30), combined with the relatively light weight of the aluminum cover, would not compromise the structural integrity of the dam, even during seismic events.

Construction of this alternative would take approximately 3.5 years to complete. It is anticipated that construction activities would start in 2014 and be completed in 2018. Similar to the proposed project, the general truck route during construction would be between I-405 and the north SCRC entry (at Mulholland Drive) via Skirball Center Drive and Mulholland Drive. No road closures are anticipated during construction, but traffic control measures, such as flag persons, may be required at times to facilitate construction vehicle ingress and egress at the SCRC gate. During construction, water would continue to be provided to the SCRC from the Los Angeles Aqueduct Filtration Plant in Granada Hills. It would be fed to the SCRC service area via a 60-inch line recently installed to bypass Lower Stone Reservoir. Water supplies would be further supplemented as necessary to help temporarily meet peak demand during construction with additional purchases from the Metropolitan Water District.

As with the proposed project, the aluminum cover alternative would meet two primary project objectives. It would comply with current water quality regulations and maintain local drinking water storage within the Upper Stone Reservoir service area. However, this alternative would not meet the secondary project objective of restoring the natural character of those portions of Stone Canyon involved in the project improvements.

Solar Panel Option

In an effort to help meet LADWP's ongoing commitment to renewable energy production to provide for the electrical power needs of the City, an option to install solar photovoltaic (PV) panels on the aluminum cover at Upper Stone Reservoir is under consideration. A solar energy option is not under consideration for the floating cover alternative because incompatibilities between the floating cover and the solar components would hinder operations and maintenance and compromise the integrity of both the water storage and solar energy systems. A solar energy option is not under consideration for the buried reservoir (the proposed project) because it would be contrary to the secondary objective of the project to help restore the natural character of those portions of the canyon involved in the improvements required to meet the primary water quality and water supply objectives of the proposed project. The solar panel option would extend the construction period for the aluminum cover alternative from approximately 3.5 years to 4 years.

To effectively and efficiently meet LADWP's goal of in-City solar projects, LADWP is focusing on sites that provide an opportunity for large-scale rooftop and ground mounted installations. Upper Stone Reservoir, which is located on City-owned property and offers several acres of generally unshaded area, provides such an opportunity. The Upper Stone solar facility would create approximately 5 megawatts (MW) of power generation, enough to provide for the annual electrical energy needs of over 1,500 households in the City.

The installation of the solar panels would represent an additional phase of construction that would occur after the construction of the aluminum cover itself. As such, the potential environmental impacts of the construction and operation of the aluminum cover alternative (without the solar panel component) can be considered separately, and the impacts associated with the construction and operation of the solar panel option can then be considered additionally along with any impacts related to the aluminum cover alternative.

No additional personnel would be required at the SCRC on a daily basis to maintain and operate the Upper Stone Reservoir solar power facilities. A small number of personnel may be required during brief periods when certain maintenance operations must be performed. The project would be monitored by automated methods to ensure that it is generating electricity to the specified capacity. Static PV arrays generate electricity without moving parts, and general maintenance requirements are characteristically low. Maintenance activities, such as troubleshooting, repairing, replacing, or optimizing system components, would occur on an event-driven basis. Occasional washing of the solar panels may be required in order to restore generation efficiency. However, such washing would be performed only as needed to maintain system performance and manufacturer's warranties on electrical equipment.

The following summarizes the potential environmental impacts that would be created by the aluminum cover alternative compared to those that would be created by the proposed project. Unless otherwise noted, the impacts pertain to the aluminum cover with or without the implementation of the solar panel option.

Aesthetics

- Neither the aluminum cover alternative nor the proposed project would create a significant impact to a scenic vista.
- Neither the aluminum cover alternative nor the proposed project would create a significant impact by substantially degrading the existing visual character or quality of the site and its surroundings.

Air Quality

- The aluminum cover alternative, like the proposed project, would create significant and unavoidable regional air quality impacts during certain periods of the construction phase. However, while the aluminum cover alternative would result in similar peak emissions, it would result in substantially lower emissions over the entire construction period compared to the proposed project.
- The proposed project would create a less than significant regional air quality impact related to post-construction operations. Because the aluminum cover alternative would generate no additional post-construction traffic or maintenance activity at the SCRC from passive recreation use, it would create no impacts related to regional air pollutant emissions during post-construction operations.

- The aluminum cover alternative, like the proposed project, would create a significant and unavoidable impact related to localized air pollutant emissions and TACs. However, the aluminum cover alternative would result in similar localized air pollutant concentrations but higher TAC emissions during construction compared to the proposed project.
- The proposed project would create a less than significant impact related to localized air pollutant emissions and TACs during post-construction project operations. Because the aluminum cover alternative would generate no additional post-construction traffic or maintenance activity at the SCRC from passive recreation use, it would create no impacts related to localized air pollutant emissions or TACs during post-construction operations.
- Neither the proposed project nor the aluminum cover alternative would create a significant impact related to GHG emissions from either construction or operations. However, the aluminum cover alternative would create lower GHG emissions during construction and operations when compared to the proposed project.

Biological Resources

- Both the aluminum cover alternative and the proposed project could create significant impacts related to sensitive plant and wildlife species, sensitive habitats, and migratory birds, as well as conflict with the local tree protection ordinance. With the implementation of mitigation measures BIO-A through BIO-G, these impacts would be reduced to a less than significant level under both the aluminum cover alternative and the proposed project. However, potential impacts to biological resources would be decreased under the aluminum cover alternative when compared to the proposed project because the nature and duration of construction activities.
- Unlike the proposed project, because no recreation activity at the SCRC would be provided, no long-term impacts to sensitive plant and wildlife species would occur during operation of the aluminum cover alternative.

Cultural Resources

- Both the aluminum cover alternative and the proposed project would create significant impacts related to ground disturbing activities that have the potential to uncover previously unearthed archaeological resources. With the implementation of mitigation measure CR-A, the impact would be reduced to a less than significant level.
- Both the proposed project and aluminum cover alternative would have less than significant impacts to historic resources and paleontological resources.

Wildland Fire

- Unlike the proposed project, the aluminum cover alternative would not include public access within portions of the SCRC during the post-construction operations. As such, there would be no increased risk of loss from wildland fire.

Land Use

- Unlike the proposed project, the aluminum cover alternative would require a zoning variance for the SCRC.

Noise

- Both the aluminum cover alternative and the proposed project would create a less than significant impact related to on-site construction equipment noise. However, both the proposed project and the aluminum cover alternative would create a significant noise impact associated with on-site haul truck trips. Even with implementation of mitigation measures NOISE-A and NOISE-B, the impact would remain significant and unavoidable. However, over the entire period of construction, the aluminum cover alternative would create less noise than the proposed project because of the nature and duration of the construction activities.
- Both the proposed project and the aluminum cover alternative would have a less than significant mobile noise impact associated with haul truck trips to and from the SCRC. However, the impact under the aluminum cover alternative would be less than under the proposed project because the duration of construction would be somewhat shorter and there would be substantially fewer construction haul truck trips overall.
- The proposed project would create a less than significant impact related to noise during post-construction project operations. Because the aluminum cover alternative would generate no additional post-construction traffic or maintenance activity at the SCRC from passive recreation use, it would create no impact related to noise during post-construction operations.

Transportation and Traffic

- Both the proposed project and the aluminum cover alternative would create significant impacts related to level of service at some of the study intersections during construction. Even with the implementation of mitigation measure TRANS-A and TRANS-B, the impact would remain significant and unavoidable. However, the aluminum cover alternative would create substantially fewer average and peak construction-related daily vehicle trips compared to the proposed project.
- Both the aluminum cover alternative and the proposed project would create a significant impact to the level of service on the study roadway segments during construction. However, the aluminum cover alternative would create substantially fewer average and peak construction-related daily vehicle trips compared to the proposed project.
- Both the aluminum cover alternative and the proposed project would create significant impacts related to potential safety hazards to vehicles traveling on Mulholland Drive near the SCRC gate, primarily from trucks exiting the site. With the implementation of mitigation measures TRANS-D through TRANS-F, these impacts would be reduced to a less than significant level under both the aluminum cover alternative and the proposed project. However, the aluminum cover alternative would create substantially fewer average and peak construction-related vehicle trips compared to the proposed project.
- Because the aluminum cover alternative would not provide public access to the SCRC for passive recreation, the potential safety hazard at the Mulholland gate during the operations phase would be eliminated.
- Unlike the proposed project, the aluminum cover would not create a significant impact to CMP facilities in the project vicinity during project construction.
- The proposed project would create a less than significant impact related to traffic and parking during post-construction project operations. Because the aluminum cover alternative would generate no additional post-construction traffic or maintenance activity at the SCRC

from passive recreation use, it would create no impact related to traffic and parking during post-construction operations.

ES.7.3 Environmentally Superior Alternative

In accordance with Section 15126.6(e)(2) of the CEQA Guidelines, an EIR shall identify an environmentally superior alternative among the alternatives. Most impacts related to the floating and aluminum covers would be reduced compared to the proposed project because these alternatives involve less ground disturbance, truck traffic, and construction time than the proposed project. These include impacts related to air quality/greenhouse gas emissions, biological resources, cultural resources, noise, and transportation/traffic. Both the floating cover alternative and the aluminum cover alternative (including the solar panel option) would eliminate the significant and unavoidable impact to wildland fire because public access to the SCRC would not be permitted under these alternatives. Impacts related to air quality/greenhouse gas emissions, noise, and transportation/traffic would be less under the floating cover alternative than under the aluminum cover alternative due to the reduced scope of construction required. Further, the floating cover alternative would eliminate significant impacts to biological resources and cultural resources without implementation of mitigation because ground disturbing activities would be limited to the existing Upper Stone Reservoir footprint. Lastly, the floating cover alternative would eliminate short-term construction impacts from toxic air contaminants.

The floating cover alternative would meet the two primary project objectives. It would maintain local drinking water storage capacity within the SCRC service area. However, this alternative would not meet the secondary project objective of helping to restore the natural character of those portions of Stone Canyon involved in the project improvements. Table 5-17 in Chapter 5 provides a comparison of the impacts of the alternatives to the proposed project.

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CHAPTER 1
INTRODUCTION

1.1 Summary of the Proposed Project

This Environmental Impact Report (EIR) has been prepared by the Los Angeles Department of Water and Power (LADWP) to evaluate potential environmental effects that may result from development of the proposed Upper Stone Canyon Reservoir Water Quality Improvement Project (proposed project). It has been prepared in conformance with the California Environmental Quality Act of 1970 (CEQA) statutes (Cal. Pub. Res. Code, Section 21000 et seq., as amended) and implementing guidelines (Cal. Code Regs., Title 14, Section 15000 et seq.). LADWP is the lead agency under CEQA.

Upper Stone Canyon Reservoir (Upper Stone Reservoir) is located approximately 0.5 miles south of Mulholland Drive in the Bel Air community of the City of Los Angeles. The project site is a component of the larger Stone Canyon Reservoir Complex (SCRC) property, which is owned and maintained by LADWP. To help ensure the quality, reliability, and stability of the City of Los Angeles drinking water supply and to ensure compliance with updated United States Environmental Protection Agency (EPA) water quality standards, LADWP proposes to construct a new buried concrete-covered reservoir to replace the existing uncovered Upper Stone Reservoir. The proposed project would provide essentially the same volume of storage as the existing reservoir, which has a total capacity of approximately 138 million gallons (MG). A maximum depth of 3 feet of topsoil would be placed over the buried reservoir, and shallow-rooting native plant species typical of the canyon environment and surrounding area would be installed. After completion of project construction, public access for passive recreation activities would be provided to the SCRC. The recreation functions would be operated and maintained by the Los Angeles Department of Recreation and Parks (LADRP) and/or the Santa Monica Mountains Conservancy.

1.2 CEQA Environmental Process

CEQA requires preparation of an EIR when there is substantial evidence supporting a fair argument that a project may have a significant effect on the environment. The purpose of an EIR is to provide decision makers, public agencies, and the general public with an objective informational document that discloses the potential environmental effects of the proposed project. The EIR process is intended to facilitate the evaluation of potentially significant direct, indirect, and cumulative impacts of the proposed project, and to identify potentially feasible mitigation measures and alternatives that would substantially reduce or avoid any identified significant effects. In addition, CEQA specifically requires that an EIR identify those adverse impacts determined to remain significant after mitigation.

In accordance with the CEQA Guidelines, an Initial Study was prepared and a Notice of Preparation (NOP) was distributed on June 23, 2008, to public agencies and organizations, as well as private organizations and individuals with a possible interest in the proposed project. The purpose of the NOP was to provide notification that the lead agency (LADWP) planned to prepare an EIR and to solicit input on the scope and content of the EIR. LADWP distributed approximately 5,000 postcards announcing the public scoping meeting and the availability of the

Initial Study. Over 32 copies of the Initial Study and 85 copies of the NOP were distributed to agencies, organizations, and interested individuals. In response to the NOP, 82 written comment letters were received from various agencies, organizations, and individuals. These letters and the NOP/Initial Study are included in Appendix A of this Draft EIR.

The public scoping meeting was held at the Stephen S. Wise Temple in the Bel Air community of Los Angeles on July 14, 2008. The purpose of the scoping meeting was to seek input from public agencies and the general public regarding the environmental issues and concerns that may potentially result from the proposed project. Other than representatives of LADWP, including members of LADWP's EIR preparation team, approximately 60 people attended the scoping meeting. The following list summarizes the public comments or questions that were received at the scoping meeting:

- **Project Description.** Why does LADWP need to comply with these water quality regulations? Why is LADWP reducing the amount of storage currently provided by Upper Stone Reservoir when California is only getting drier? What will LADWP do to fix the deterioration of Mulholland Drive from all of the heavy trucks? Will an entry fee be charged for the public access? Will Lower Stone Reservoir still be filled with water? How much disturbance in the hillsides will be required to construct this project? (see Chapter 2, Project Description)

- **Air Quality.** Will the dust and air pollutants travel up the canyon? (see Chapter 3.2, Air Quality)

- **Biological Resources.** Only native plants should be planted on top of the buried tanks. What are the impacts to wildlife from the proposed project? Is the canyon a migratory corridor? Will construction of the project affect bird migration? Construction in the canyon has the potential to disturb reptiles and rattlesnakes. (see Chapter 3.3, Biological Resources)

- **Cultural Resources.** How old is the existing reservoir? (see Chapter 3.4, Cultural Resources)

- **Geology and Soils.** LADWP should consider the impacts of moving large amounts of earth when periodic flooding and mudslides could occur. Disturbance in the hillsides could undermine the stability of other areas (see Chapter 4, Impact Overview)

- **Wildfire.** Public access could lead to fires that would endanger the entire community. Construction activity could start a fire along the crest of Mulholland Drive. Would construction of the tanks hinder fire suppression activities? (see Chapter 3.5, Wildland Fire)

- **Noise.** There is an echo effect on Woodfield Court. How much more noise would be generated by the proposed project? (see Chapter 3.6, Noise)

- **Transportation and Traffic.** How will trucks make a left turn out of the project site onto Mulholland Drive? (see Chapter 3.7, Transportation and Traffic)

- **Alternatives.** Would it be less expensive to cover the existing reservoir? LADWP should consider building a filter plant for Upper Stone Reservoir like the one completed for

Lower Stone Reservoir. LADWP should consider above ground storage tanks. (see Chapter 5, Alternatives)

This EIR focuses on the environmental impacts identified as potentially significant during the scoping process, including the analysis contained in the Initial Study and comments received in response to the NOP. The issue areas analyzed in detail in this EIR include aesthetics, air quality/greenhouse gas emissions, biological resources, cultural resources, wildland fire, noise, and transportation/traffic. Other issue areas determined not to create significant effects are addressed in Section 4.2 of this EIR.

This Draft EIR is being circulated for 45 days for public review and comment. The timeframe of the public review period is identified in the Notice of Availability attached to this Draft EIR. During this period, comments from the general public, organizations, and agencies regarding environmental issues analyzed in the Draft EIR and the Draft EIR's accuracy and completeness may be submitted to the lead agency at the following address:

Ms. Julie Van Wagner
Department of Water and Power
City of Los Angeles
111 North Hope Street, Room 1044
Los Angeles, CA 90012
Phone: (213) 367-4466 (message box)

General questions about this EIR and the EIR process may also be directed to the address or phone number above. LADWP will prepare written responses to comments pertaining to environmental issues raised in the Draft EIR review if they are submitted in writing and postmarked by the last day of the public review period identified in the Notice of Availability.

Prior to approval of the proposed project or an alternative to the proposed project, the City of Los Angeles Board of Water and Power Commissioners, as the decision making entity related to the project, is required to certify that this EIR has been completed in compliance with CEQA, that the EIR reflects the independent judgment of the lead agency, and that the information in this EIR has been considered during the review of the project. CEQA also requires the Board of Water and Power Commissioners to adopt "findings" with respect to each significant environmental effect identified in the EIR (Cal. Pub. Res. Code Section 21081; Cal. Code Regs., Title 14, Section 15091). For each significant effect, the approving agency must make one or more of the following findings:

- Alterations have been made to avoid or substantially lessen significant impacts identified in the Final EIR.
- The responsibility to carry out such changes or alterations is under the jurisdiction of another agency.
- Specific economic, legal, social, technological, or other considerations make infeasible mitigation measures or project alternatives identified in the Final EIR.

If the Board of Water and Power Commissioners concludes that the proposed project or an alternative to the proposed project will result in significant effects that have been identified in this EIR but cannot be substantially lessened or avoided by feasible mitigation measures and/or alternatives, it must adopt a "statement of overriding considerations" in order to approve the project (Cal Pub. Res. Code Section 21081 [b]). Such statements are intended under CEQA to provide a means by which the lead agency balances, in writing, benefits with significant and unavoidable environmental impacts. Where the lead agency concludes that the economic, legal, social, technological, or other benefits outweigh the unavoidable environmental impacts, the lead agency may find such impacts "acceptable" and approve the proposed project.

In addition, the Board of Water and Power Commissioners must also adopt a Mitigation Monitoring and Reporting Program describing the changes that were incorporated into the project or made a condition of approval in order to mitigate or avoid significant effects on the environment (Cal. Pub. Res. Code Section 21081.6). The Mitigation Monitoring and Reporting Program is adopted at the time of approval and is designed to ensure compliance during implementation. Upon approval of the proposed project or an alternative to the proposed project, the lead agency will be responsible for implementation of the Mitigation Monitoring and Reporting Program.

1.3 Organization of the EIR

This EIR is organized as follows:

The **Executive Summary** provides an overview of the information provided in detail in subsequent chapters. It consists of an introduction; a brief description of the proposed project; a discussion of issues raised by the public and agencies relative to the project construction and operations; a table that summarizes the environmental impacts in each issue area, the significance determination for those impacts, necessary mitigation measures, and significance after mitigation; and a comparative discussion of alternatives to the proposed project.

Chapter 1 provides a summary of the proposed project, an overview of the CEQA environmental review process, and a description of the organization of the EIR.

Chapter 2 provides a description of the proposed project. Project objectives are identified, and information on the proposed project characteristics and construction and operation is provided. This chapter also includes a description of the intended uses of the EIR and public agency actions related to the proposed project.

Chapter 3 describes the potential environmental effects of implementing the proposed project. The discussion in Chapter 3 is organized by seven environmental issue areas, as follows:

- Aesthetics
- Air Quality/Greenhouse Gas Emissions
- Biological Resources
- Cultural Resources
- Wildland Fire
- Noise
- Transportation and Traffic

For each environmental issue, the analysis and discussion are organized into five subsections as described below:

Environmental Setting - This subsection describes, from a local and regional perspective, the physical environmental conditions in the vicinity of the proposed project and at the project site. The environmental setting establishes the baseline conditions which were used to determine whether specific project-related impacts would be significant.

Thresholds of Significance - This subsection identifies a set of thresholds according to which the level of impact is determined.

Environmental Impacts - This subsection provides information on the environmental effects of the proposed project and whether the impacts of the proposed project would meet or exceed the established significance criteria.

Mitigation Measures - This subsection identifies feasible mitigation measures that would avoid or substantially reduce significant adverse project-related impacts.

Significance after Mitigation - This subsection indicates whether project-related impacts would be reduced to below a level of significance with implementation of the mitigation measures identified in the EIR. This subsection also identifies any residual significant and unavoidable adverse effects of the proposed project that would result even after the mitigation measures have been implemented.

Chapter 4 presents other mandatory CEQA sections, including the following:

Unavoidable Significant Adverse Impacts - This subsection identifies and summarizes the unavoidable significant impacts described in greater detail in Chapter 3.

Effects Not Found to Be Significant - This subsection identifies and summarizes the issue areas that were determined to have no adverse environmental effect or a less than significant environmental effect given the established significance criteria.

Cumulative Impacts - This subsection addresses the potentially significant cumulative impacts that may result from the proposed project when taking into account other past, present, and reasonably foreseeable future projects.

Irreversible Environmental Changes - This subsection addresses the extent to which the proposed project would result in a significant commitment of nonrenewable resources.

Growth-Inducing Impacts - This subsection describes the potential of the proposed project to induce economic or population growth or the construction of additional housing, either directly or indirectly, in the surrounding environment.

Chapter 5 describes and evaluates the comparative merits of a reasonable range of alternatives to the proposed project that would feasibly attain most of the basic objectives of the proposed project and avoid or substantially lessen potentially significant project-related impacts. The chapter also describes the analysis and rationale for selecting the range of alternatives discussed in the EIR and identifies the alternatives considered by LADWP that were rejected from further detailed analysis during the environmental analysis process. Chapter 5 also includes a discussion of the environmental effects of the No Project Alternative and identifies the environmentally superior alternative.

Chapter 6 provides a list of acronyms and abbreviations used in this EIR.

Chapter 7 provides a bibliography of reference materials used in preparation of this EIR.

Chapter 8 identifies those persons responsible for preparation of this EIR.

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CHAPTER 2
DESCRIPTION OF THE PROPOSED PROJECT

2.1 Overview of the Project

To help ensure the quality, reliability, and stability of the City of Los Angeles drinking water supply and to ensure compliance with updated EPA water quality standards, LADWP proposes to construct a new buried concrete-covered reservoir (buried reservoir) to replace the existing uncovered Upper Stone Reservoir. The new buried reservoir would consist of a reinforced concrete liner, concrete perimeter retaining walls, an extensive system of interior concrete shear walls and columns, and a concrete roof. The new buried reservoir would be constructed in essentially the same location as the existing reservoir, although with a slightly reduced footprint. This would necessitate the demolition of the existing reservoir bottom, sides, inlet structure, and outlet tower. A maximum depth of 3 feet of topsoil would be placed over the buried reservoir, and shallow-rooting native plant species typical of the canyon environment and surrounding area would be installed. After completion of project construction, public access consisting of pedestrian trails would be provided in portions of the SCRC property. The trails function would be operated and maintained by the LADRP and/or the Santa Monica Mountains Conservancy. Ownership and general maintenance of the SCRC would remain under LADWP.

The buried reservoir analyzed as the proposed project in this EIR is consistent with the buried concrete structure described in the Notice of Preparation for the EIR (June 2008), but differs in several respects from the proposed project that was presented to the public during an EIR scoping meeting (July 2008) and a subsequent public meeting (December 2008) held in the Stone Canyon community to provide information regarding the Upper Stone Canyon Reservoir Water Quality Improvement Project and elicit public comment regarding potential environmental impacts and other project concerns. During these meetings, the proposed project was described as a series of three separate underground cylindrical concrete tanks that would be constructed within the basic footprint of the existing reservoir. While this underground tanks option would achieve the objectives of the proposed project (see Section 2.5 below), it was preliminarily determined that it may also result in several potentially significant environmental impacts related to air quality, traffic, noise, and biological and visual resources, largely associated with extensive earthwork operations required to construct and fully bury the concrete tanks. It was preliminarily estimated that these operations would entail the movement of over 2 million cubic yards (CY) of earth material on site and would involve the disturbance of relatively large areas in Stone Canyon (up to 40 acres) that lie outside the general footprint of the existing reservoir and that would be used as material borrow and stockpile sites.

Consistent with the intent of CEQA to utilize the public disclosure and participation process as an influence on project definition and to prevent or reduce, where possible, environmental impacts associated with project implementation, LADWP, in response to community input and based on detailed investigations related to feasibility (including the reservoir dam integrity and safety), has developed the current buried reservoir concept as the proposed means to provide a water storage facility at Upper Stone Canyon. The buried reservoir would meet the primary and secondary objectives of the proposed project and would significantly lessen, although not necessarily eliminate, the potential environmental impacts associated with the previously proposed underground concrete tanks option, primarily by reducing the quantity of earthwork required and by confining most, but not all, construction activities to the reservoir itself and immediately adjacent areas.

2.2 Project Location

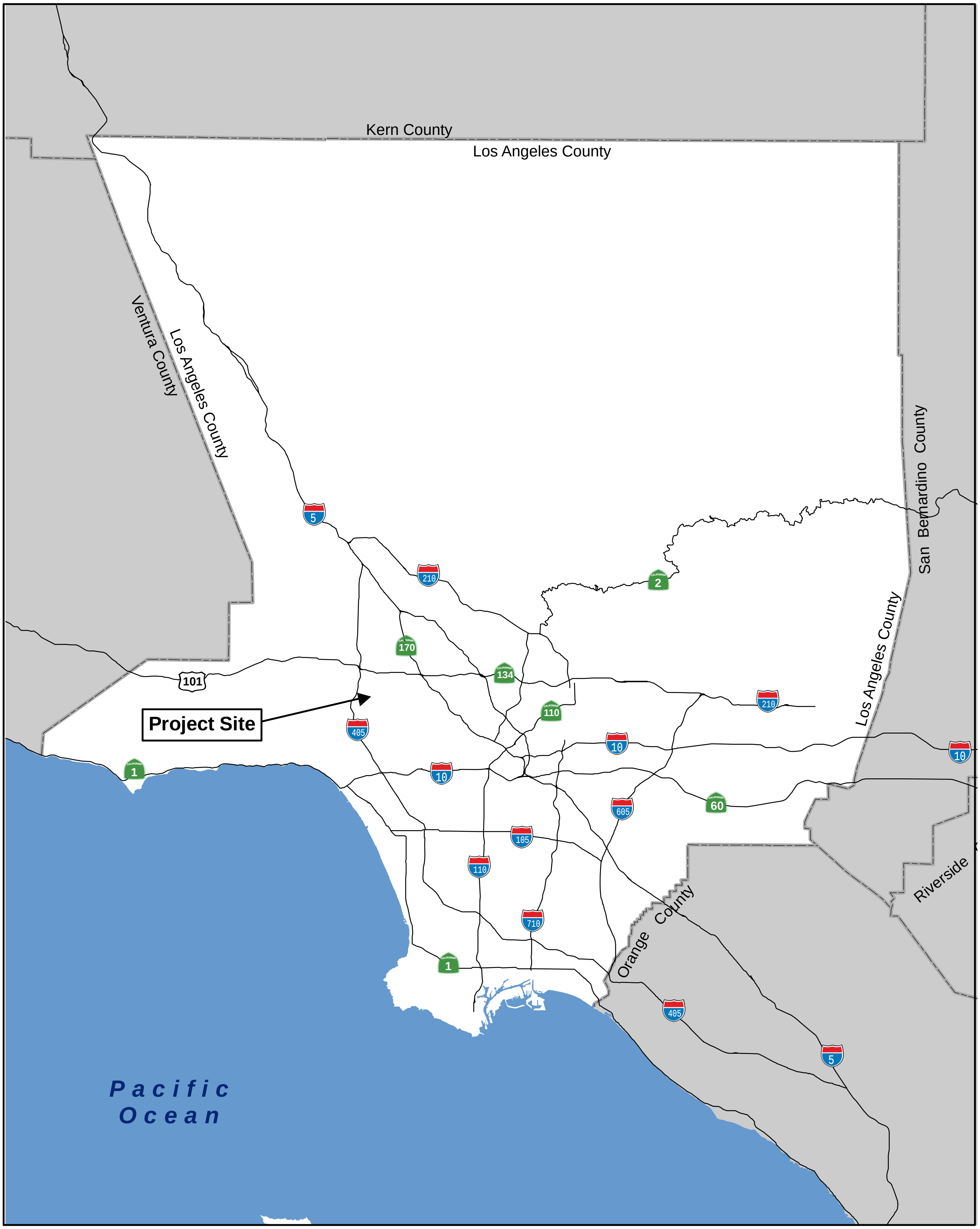
Upper Stone Reservoir is located approximately 0.5 miles south of Mulholland Drive between Roscomare Road and Beverly Glen Boulevard in the City of Los Angeles. The SCRC property is owned and maintained by LADWP. Upper Stone Reservoir itself is accessed from Mulholland Drive via a non-public road located approximately 1.5 miles east of the San Diego Freeway (Interstate [I] 405). Figure 2-1 shows Upper Stone Reservoir in relation to the region, and Figure 2-2 shows the vicinity of the SCRC.

2.3 Historical Perspective and Current Operations of Upper Stone Reservoir

Upper Stone Reservoir is a component of the larger SCRC, which consists of approximately 750 acres of property owned and maintained by LADWP. The SCRC is not currently open to public access. The original Stone Canyon Reservoir, now referred to as Lower Stone Canyon Reservoir (Lower Stone Reservoir), was created in 1921 by damming the canyon and providing water through pipelines from upstream supplies. Lower Stone Reservoir provided storage for approximately 3.4 billion gallons of drinking water to serve western areas of the City of Los Angeles. However, it has now been taken out of service as a drinking water source as part of a system-wide initiative to comply with EPA and California Department of Public Health drinking water quality requirements related to the 1989 Surface Water Treatment Rule. To facilitate the removal of Lower Stone Reservoir from service, a new water supply conduit was constructed to operationally bypass the lower reservoir and deliver water from Upper Stone Reservoir and upstream supply lines directly to the SCRC service area distribution system. Lower Stone Reservoir will not be modified under the proposed project described in this EIR, and it will remain an uncovered reservoir filled with essentially raw water that will be used only in extreme emergency circumstances. Because it was formed by simply impounding water in a canyon behind a dam, Lower Stone Reservoir has the appearance of a natural water body with unpaved and irregular edges.

Upper Stone Reservoir was constructed in the early 1950s to provide approximately 138 MG of additional drinking water storage capacity and increase the distribution system operating pressure for portions of the SCRC service area. Treated drinking water is supplied to the SCRC by pipelines that originate at the LADWP Van Norman Complex in Granada Hills and traverse the San Fernando Valley. The SCRC is fed directly from the Stone Canyon Reservoir Regulating Station, located on Stone Canyon Avenue north of Mulholland Drive, through the 4,500-foot long Stone Inlet Line tunnel.

Upper Stone Reservoir, which is currently uncovered, provides drinking water to approximately 450,000 people in a service area that includes Beverly Glen, West Los Angeles, Pacific Palisades, Marina Del Rey, and the Los Angeles International Airport vicinity. In general, water flows through the reservoir on a continuous basis at varying rates depending on drinking water demand in the service area. Upper Stone Reservoir provides crucial emergency storage and operational capacity that allows for the flexibility necessary to meet peaks in demand that could not be satisfied long term through other sources or through the use of water distribution pipelines alone. The operational flexibility provided by Upper Stone Reservoir has become increasingly important since the loss of the vast amount of storage (3.4 billion gallons) previously provided by, but no longer available from, Lower Stone Reservoir.



Source: California Geospatial Information Library (2003-5)

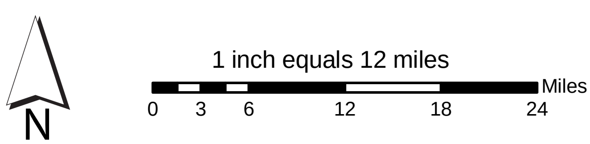
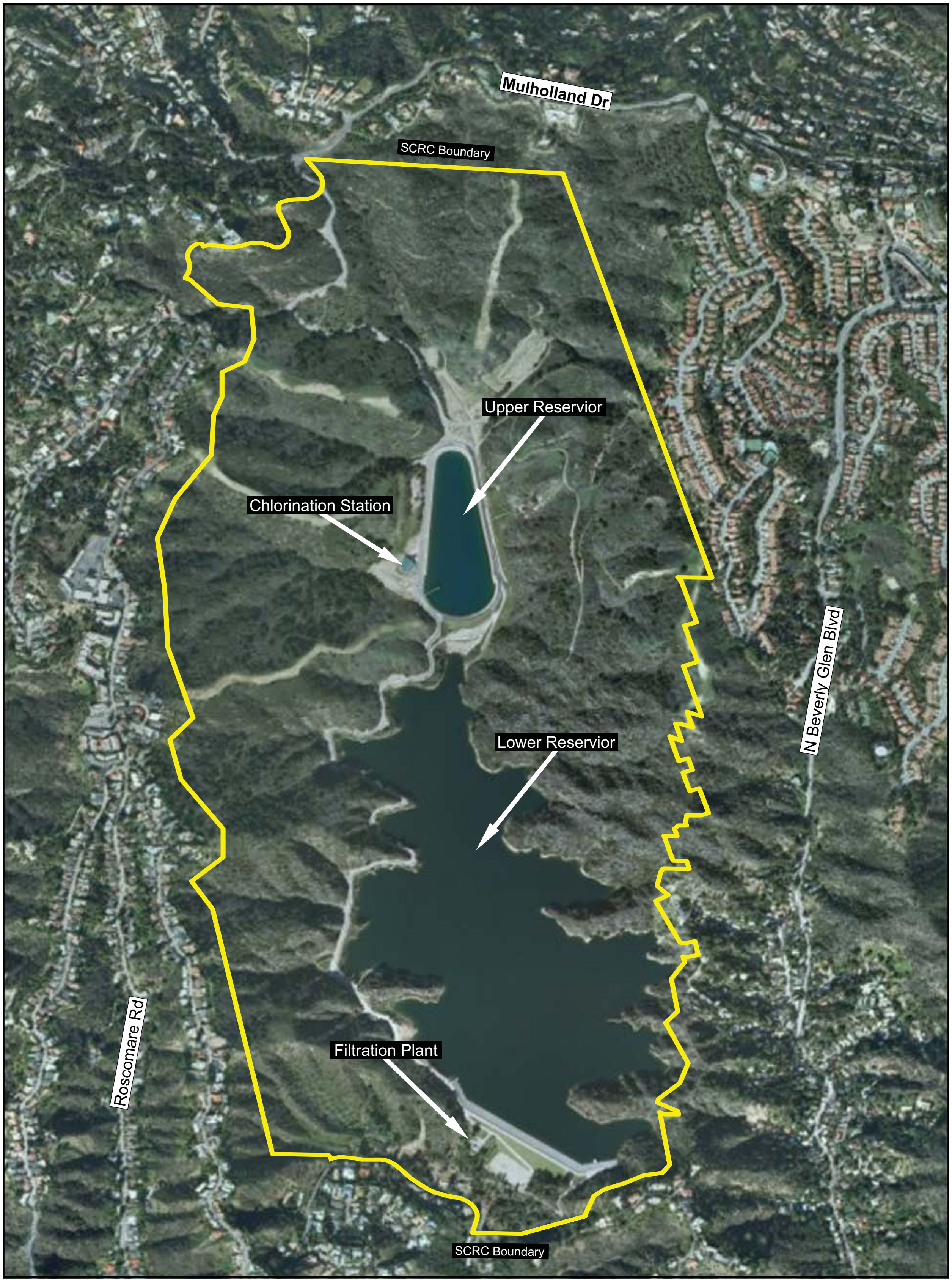


Figure 2-1
Regional Location Map



Source: ESRI Imagery World 2D 2009

Figure 2-2
Project Vicinity

For two decades, LADWP has worked closely with the Stone Canyon Subcommittee of the Coalition to Preserve Open Reservoirs (CPOR) to determine the nature and extent of facility improvements at the SCRC that are required to meet federal and state drinking water standards. This process was an outgrowth of public meetings in the late 1980s between LADWP and numerous citizens groups in communities throughout the City related to proposed physical and operational changes at the City's open reservoirs necessary to implement the Surface Water Treatment Rule, first promulgated by the EPA in 1989. In 1990, the Los Angeles City Council directed that decisions regarding improvements at several open reservoirs (including those at the SCRC) be conducted through a mediation process between LADWP and the CPOR committee associated with each reservoir. A primary aim of the Stone Canyon Subcommittee of CPOR has been to maintain and restore the natural character of the canyon. In relation to Lower Stone Reservoir, this included the preservation of the lower reservoir as an open water body, the design and scale of a new water filtration plant located south of the Lower Stone Reservoir dam, and locating a new bypass line on the bottom of the lower reservoir itself to minimize disturbance to land surrounding the lower reservoir. In relation to the improvements at Upper Stone Reservoir necessary to comply with federal and state water quality regulations, some members of CPOR have advocated a solution that would allow for the upper reservoir to be buried and for planting atop the reservoir to help restore the natural character in portions of the canyon.

2.4 Physical Setting

2.4.1 Existing Facility

The existing Upper Stone Reservoir has a storage volume of approximately 138 MG at the high water elevation of 930 feet. It has a maximum depth of 49 feet and a surface area of approximately 14 acres at the high water elevation. Upper Stone Reservoir is approximately 1,600 feet long and approximately 600 feet wide at the maximum width, near the outlet tower at the southern end, tapering to approximately 330 feet wide, near the inlet at the northern end. Unlike Lower Stone Reservoir, with its unpaved and irregular edges, the materials and shape of Upper Stone Reservoir impart a clearly manmade appearance. Upper Stone Reservoir has continuous, straight edges and is teardrop in shape. The bottom and sides of the upper reservoir are paved with asphaltic concrete, which has been tinted to more closely match the color of the soil in the surrounding area. The water level in the reservoir can fluctuate considerably, exposing more or less of the asphalt side walls. An 8-foot tall chain link fence encloses the entire reservoir, running along its perimeter. A 15- to 20-foot wide paved maintenance road is located around the perimeter of the reservoir. A 15-foot diameter outlet tower is located in the southwest corner of the reservoir, projecting to a height approximately 30 feet above the water surface at the high water elevation. The tower is connected to the perimeter road by an approximately 140-foot long footbridge. Figure 2-3 shows the existing Upper Stone Reservoir site.

In addition to the bypass line constructed as part of the Lower Stone Reservoir project, facilities recently constructed at the SCRC include a new chlorination station, located adjacent to the west side of Upper Stone Reservoir, and a filtration plant, located south of the Lower Stone Reservoir dam. The 750-acre SCRC property remains essentially undeveloped, other than the reservoirs and appurtenant facilities.

Source: ESRI Imagery World 2D 2009

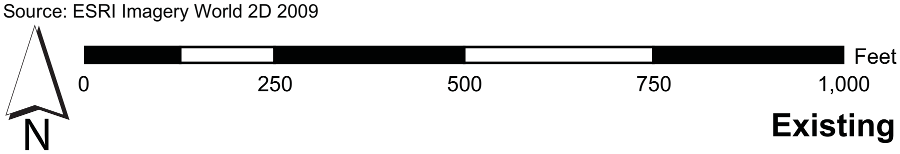


Figure 2-3
Existing Upper Stone Reservoir

2.4.2 Surrounding Land Uses

The proposed project would be contained entirely within the boundaries of the SCRC property. Land uses surrounding the property are predominantly low- to very low-density residential. The northern portion of the SCRC, located just north of Upper Stone Reservoir itself, is included within the Outer Corridor zone of the Mulholland Scenic Parkway Specific Plan Area, which encompasses an area extending outward 0.5 miles from the road right-of-way. The specific plan has been designated to help preserve natural scenic values and enhance passive recreation opportunities along the Mulholland Drive corridor. The northwestern-most corner of the SCRC property, including the north entry gate to the property, is located within the Mulholland Scenic Parkway Specific Plan Area Inner Corridor, which extends outward 500 feet from the road right-of-way and within which greater restrictions on development activities apply.

2.4.3 General Plan Designation and Zoning

Along with the entire SCRC, Upper Stone Reservoir is designated as Open Space in the City of Los Angeles General Plan. The project site is located within the Bel Air-Beverly Crest Community Plan area. The zoning designation for the SCRC is OS (Open Space). The City of Los Angeles Municipal Code states that a purpose of the OS zone is to encourage the management of public lands in a manner which protects the natural resources and features of the environment. While Upper Stone Reservoir itself is located outside the Outer Corridor zone of the Mulholland Scenic Parkway Specific Plan Area, portions of the Outer Corridor zone would be used temporarily during construction for access, materials laydown, parking, and/or construction offices. Areas within the Outer Corridor zone would also be used for the temporary stockpiling of excavated earth material required for the proposed project. In addition, parking for trails access and a limited trails network would be implemented in the Outer Corridor zone during post-construction operations of the proposed project. The portion of the SCRC property located within the Inner Corridor of the Mulholland Scenic Parkway Specific Plan Area would not be affected by the proposed project, other than to provide continued site access during construction and operations.

2.5 Project Objectives

The purpose of the proposed project is to maintain and improve the quality, reliability, and stability of the SCRC service area drinking water supply in order to continue to meet customer demand.

The primary project objectives related to this purpose are to:

- Comply with updated water quality standards enacted by the EPA and, by extension, the California Department of Public Health, including the Stage 2 Disinfectants and Disinfection Byproducts Rule (D-DBPR), which establishes new regulations related to the formation of potentially carcinogenic disinfection byproducts that may result from certain drinking water chemical disinfection processes, and the Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR), which establishes new regulations related to the presence of microbial pathogens in drinking water supplies.
- Preserve local water storage capability to maintain reliability and flexibility to meet the SCRC service area demand for drinking water at required distribution system pressures, including during emergency or planned outages of upstream supplies.

A secondary objective of the proposed project is to help restore the natural character of those portions of Stone Canyon involved in the project improvements, to the extent that this can be accomplished consistent with the achievement of the primary water quality and water storage objectives.

Stage 2 Disinfectants and Disinfection Byproducts Rule

Based on 1996 amendments to the Federal Safe Drinking Water Act, the EPA has promulgated the Stage 2 D-DBPR to balance the risks related to microbial pathogens (i.e., disease-causing bacteria, viruses, and parasitic protozoa), which are normally largely inactivated and/or removed from drinking water by disinfection and filtration, against the production of disinfection byproducts in drinking water, which result from chemical reactions involving the use of chlorine as a disinfectant. The treatment of drinking water with disinfectants is considered one of the most important public health accomplishments of the past century, and it has significantly reduced the incidence of serious waterborne diseases, such as typhoid and cholera. The most common method of disinfection has been the addition of relatively small amounts of chlorine to drinking water. However, due to advances in the ability to detect chemical compounds in water, it is now known that reactions between chlorine and the relatively small amount of natural organic matter present in even treated drinking water can form disinfection byproducts. These disinfection byproducts are volatile organic compounds, such as trihalomethanes and haloacetic acids, which have now been linked, when present at elevated levels in laboratory tests, to potential increased risks of certain types of cancer.

Currently, chlorine is used as a secondary residual disinfectant for water that has received primary treatment in the Los Angeles Aqueduct Filtration Plant, located at the Van Norman Complex in Granada Hills. In order to minimize the production of disinfection byproducts in accordance with the Stage 2 D-DBPR, LADWP intends to change over to the use of chloramines. Formed by a mixture of chlorine and ammonia, chloramines are less reactive than chlorine with natural organic matter. Chloramines will replace chlorine throughout the LADWP drinking water distribution system. This changeover to chloramines has already occurred in some drinking water service areas within the LADWP system.

Chloramines are much more stable than chlorine, providing a longer-lasting residual effect throughout the water delivery system and reducing the requirement for supplemental application along the water distribution route. Chloramines are not as potent as chlorine at killing microbial pathogens, but they still provide adequate disinfection to meet safe drinking water standards. This chloramination approach is consistent with EPA mandates to balance disinfection considerations with the requirement to reduce the level of chlorine-related disinfection byproducts in drinking water.

In addition to the disinfection byproducts regulated under the Stage 2 D-DBPR, the formation of bromate in the LADWP drinking water system has also become a concern related to the storage of treated drinking water in uncovered reservoirs. Like the trihalomethanes and haloacetic acids addressed in the Stage 2 D-DBPR, bromate is a chemical compound that has been linked, when present at elevated levels in laboratory tests, to increased risks of certain types of cancer. Bromate levels in drinking water are regulated by the California Department of Public Health. Bromate can be formed when naturally occurring bromide contained in source water interacts with chlorine in the presence of sunlight. The LADWP system-wide changeover to chloramines would also eliminate this potential interaction between bromide and chlorine that can create bromate.

However, field demonstrations conducted by LADWP have established that it is difficult in uncovered reservoirs to maintain the intended chloramine residual and optimal chlorine-to-ammonia ratio necessary to protect drinking water supplies. The demonstrations have indicated that chloramines degrade rapidly in open reservoirs, reducing residual disinfectant levels in drinking water. Chloraminated water supplies exposed to sunlight in uncovered reservoirs also then become susceptible to algae blooms. The application of additional chloramines to the reservoir after an algae bloom occurs has proven ineffective in reducing the large concentrations of algae contained in the bloom. The use of other chemicals, such as chlorine dioxide and copper sulfate, has also proven ineffective because of limitations on their allowable application rates. Adding chlorine, while more effective in controlling algae, would have the potential to generate disinfection byproducts, thereby defeating the intent of the Stage 2 D-DBPR that has prompted the change-over to chloramines.

Replacing the existing Upper Stone Reservoir with a buried reservoir would allow for the proper management of chloramine disinfectant levels and would prevent the exposure of the treated water to sunlight, which promotes the growth of algae. Because the system-wide changeover to chloramines is being implemented to comply with Stage 2 D-DBPR mandates (and to limit the potential formation of bromate), the ability to manage chloramine residual to safeguard drinking water supplies in the SCRC service area is an essential aspect of the proposed project and alternatives to the proposed project.

Long Term 2 Enhanced Surface Water Treatment Rule

In conjunction with the Stage 2 D-DBPR, the EPA has also promulgated the LT2ESWTR to reduce the incidence of disease associated with certain pathogenic microorganisms that have the potential to exist in drinking water. This rule primarily addresses the treatment of drinking water that has surface water as its source, but it also applies to treated water stored in open reservoirs. The rule establishes limits for the presence of certain protozoan pathogens (especially Cryptosporidium) that cause gastrointestinal illness that can be severe or fatal for sensitive groups, such as the elderly, infants, or those with compromised immune systems. The LT2ESWTR requires that either uncovered treated-water reservoirs be covered to limit exposure to the environment and prevent recontamination or that water from uncovered treated-water reservoirs be re-treated before entering the distribution system to achieve established limits for pathogens.

The water treatment system currently used at the Los Angeles Aqueduct Filtration Plant adequately destroys and/or removes Cryptosporidium protozoa during treatment using a multiple-barrier system. This includes the use of ozone, which has been found to be effective at reducing Cryptosporidium levels, followed by the successive use of coagulation, flocculation, and biologically active rapid-rate deep-bed filters, which effectively remove most Cryptosporidium protozoa prior to discharge of the water from the plant. However, regardless of this primary treatment, the LT2ESWTR also includes provisions to ensure that downstream uncovered treated-water storage facilities, such as Upper Stone Reservoir, are managed to maintain the microbial protection of the treated water they receive before the water is discharged from the storage facilities and enters the distribution system. Treated water stored in uncovered reservoirs can be contaminated from numerous sources that could come in contact with the open water surface, including incidental surface water runoff, bird and animal waste, and airborne deposition (including pollutants and bacteria). Treatment at the point of discharge to comply with LT2ESWTR requirements, while not covering Upper Stone Reservoir, would contribute to the degradation of chloramine residual and the optimal chlorine-to-ammonia ratio necessary to maintain an appropriate disinfectant level in the drinking water supply. A solution that responds simultaneously to each water quality issue (i.e., the LT2ESWTR mandates and the maintenance of chloramine residual in relation to the Stage 2 D-DBPR mandates) is necessary. Therefore, it has been proposed that the existing uncovered reservoir be replaced with a buried reservoir to mitigate contamination risks. Compliance with the LT2ESWTR at Upper Stone Reservoir is an essential aspect of the proposed project and alternatives to the proposed project.

Local Water Storage Capability

Beginning in the 1970s, LADWP began efforts to address issues associated with the potential degradation of water quality at its 15 in-City uncovered water storage reservoirs. These reservoirs were dispersed throughout the water distribution system to provide critical local storage capability to meet fluctuations in demand within individual service areas and respond to situations when the primary upstream supply lines or facilities that feed the reservoir service areas may be temporarily out of service due to an unforeseen emergency or planned outage. To preserve this local storage capability while meeting increasingly stringent water quality requirements, a number of the smaller open reservoirs in the system have been covered or replaced with tanks.

In 1991, several of the largest reservoirs in the system, including Encino, Upper and Lower Hollywood, and Lower Stone Canyon, were determined by the California Department of Public Health, in accordance with the 1989 Surface Water Treatment Rule, to be susceptible to contamination from pathogens and pollutants contained in surface water runoff from adjacent hillsides. A number of options were considered to resolve the contamination concerns, including the installation of covers on the reservoirs and the disinfection and filtration of water as it was discharged from the reservoirs into the local distribution system. Based on many considerations, including extensive community involvement, cost and engineering concerns, the location and function of these reservoirs within the LADWP water supply system, and improvements being implemented to the City water distribution system, it was determined that to control potential contamination of the drinking water supply from surface water runoff, the four reservoirs mentioned above, including Lower Stone Reservoir, should be removed from service as potable water sources.

Although these reservoirs remain in place, most treated drinking water that previously reached the reservoirs is now diverted to the distribution system, including other local storage tanks or reservoirs. Small filtration plants operate at some of the reservoirs to treat water that must be discharged to manage the reservoir water level and quality, but the reservoirs now provide storage for non-potable water that will be utilized as drinking water only during extreme emergencies. The removal of these larger reservoirs from service has eliminated approximately 8 billion gallons of treated water from the LADWP in-City storage system. The ability to continue to provide water to the service areas of these reservoirs was a key consideration in their removal from service. Underground tanks have been installed at the Hollywood Reservoir site to partially replace the lost local storage capacity of the upper and lower reservoirs. The storage offered by Encino Reservoir has become less critical because of extensive upgrades to the water distribution system in the San Fernando Valley that have established significantly greater flexibility and redundancy in providing drinking water to the former Encino Reservoir service area.

The centralization and reduction of water storage within the City has placed greater reliance on the fewer remaining facilities to meet fluctuations in demand and provide emergency storage within local service areas. While emergency supply for the SCRC service area would still be available from Lower Stone Reservoir, it would consist essentially of untreated raw water that would be chlorinated and distributed only in extreme emergencies when other supplies were exhausted; the distribution of water from Lower Stone Reservoir also would require a boil water notice to consumers. After such an emergency distribution, flushing and water quality testing of affected supply pipelines (potentially the entire SCRC service area distribution system) would also be necessary to purge the system of potentially unsafe water. The decision to remove Lower Stone Reservoir from service was based partially on the fact that Upper Stone Reservoir would continue to provide for the SCRC service area water demand.

Upper Stone Reservoir is a primary source of water for numerous communities in the western part of the City, and in the future, it will also provide secondary support for the Franklin Canyon Reservoir, Hollywood Reservoir, and Silver Lake Reservoir service areas through a planned connection to the recently constructed Stone-Hollywood Trunk Line. Installation of the new buried reservoir would maintain critical local supplies that provide drinking water to these service areas to respond to temporary losses of upstream sources related to a line rupture or other facility outage until repairs or interim operational modifications to circumvent the breakdown could be implemented. It would also provide flexibility to conduct scheduled maintenance of upstream supply facilities as required and still provide water to the SCRC service area at acceptable pressure levels, even though the inflow to the SCRC may be temporarily interrupted. The proposed project would provide essentially the same volume of storage as the existing Upper Stone Reservoir, which has a total capacity of approximately 138 MG. Maintaining local water storage capability in the SCRC service area to respond to emergencies and other outages is an essential aspect of the proposed project and alternatives to the proposed project.

In addition to providing crucial supplies during a temporary loss of upstream sources of water, Upper Stone Reservoir plays a critical role in maintaining local water supplies that help accommodate the often wide fluctuations in demand experienced in the SCRC service area on a daily basis. To maintain operational stability, the storage provided by Upper Stone Reservoir supplements water supplies during high-use periods when the outflow from the reservoir generated by customer demand exceeds inflow from upstream supply lines. Without the operational flexibility provided by the reservoir, this peak use in the SCRC service area would not be met solely by dependence on the distribution system and upstream supplies, which originate at the Van Norman Complex. Replacing the existing Upper Stone Reservoir with a buried structure as a means to achieve the Stage 2 D-DBPR and LT2ESWTR mandates would allow for the continuation of this critical role of providing operational stability to meet fluctuations in demand. Reliability and flexibility required to provide water during peak demand periods is an essential aspect of the proposed project and alternatives to the proposed project.

A buried reservoir would also increase the stability of the service area drinking water supply by eliminating evaporation from the surface of the existing open-air Upper Stone Reservoir. Based on the size of the upper reservoir and the general climatic conditions in the region, approximately 16 to 19 MG of water that would otherwise be lost to evaporation would be conserved each year by covering the reservoir. This volume of water would serve the average annual needs of approximately 100 to 120 households in the City.

Restore Natural Character of Portions of Stone Canyon

LADWP has worked with the Stone Canyon Subcommittee of CPOR for many years to help maintain community and environmental values in relation to facility improvements for both Lower and Upper Stone Reservoirs. The intent of this process has been to minimize permanent and temporary environmental impacts from construction and operations at the SCRC while still adhering to updated federal and/or state water quality regulations and continuing to provide adequate drinking water supplies to sections of the City. In relationship to the Upper Stone Canyon Reservoir Water Quality Improvement Project, some members of CPOR have played a primary role in promoting reservoir covering solutions that would help restore the natural character of those portions of the canyon involved in the project. Among the feasible methods to achieve the primary water quality and water storage objectives of the proposed project, a buried structure is the only means to allow for plant material to be established on top of Upper Stone Reservoir, thereby helping to restore the natural character of the site.

However, the concrete roof could only support a maximum of 3 feet of soil cover due to structural limitations. This would limit the type of plant material that could successfully establish on the buried reservoir because of the relatively shallow soil depth. Deep-rooting plants would also need to be avoided directly atop of or adjacent to the reservoir to limit potential structural damage to the reservoir walls or roof from root penetration. While several species common to the coastal sage scrub community of Stone Canyon are relatively shallow rooting and would be appropriate for planting atop the buried reservoir, other species also commonly found in the canyon, including some members of the chaparral and oak-walnut woodland communities, could not be planted. Because of the limited height profile and narrower species mix of the native plants that could be successfully established on the buried reservoir and because of the generally flat terrain of the upper reservoir site (as opposed to the steeper slopes of the surrounding canyon), the proposed project would not entirely replicate, either visually or biologically, the natural habitat of Stone Canyon. However, it would generally mimic the canyon environment, providing an area of lower-growing scrub vegetation, while essentially concealing the manmade elements of Upper Stone Reservoir.

2.6 Project Description

As discussed above, to accomplish the objectives of the proposed project, the open-surface Upper Stone Reservoir would be replaced with a new buried concrete-covered reservoir. Figure 2-4 indicates the general limits of construction activity related to the project. Other than manholes, hatches providing access to the interior of the buried reservoir, above ground vent structures, above ground electrical cabinets, and similar appurtenant facilities, water storage and distribution facilities would be essentially concealed underground after completion of construction. However, a paved road would still be required around the buried reservoir to provide vehicular access for maintenance and operations.

Certain constraints prevent the direct placement of a concrete roof over the existing Upper Stone Reservoir, which was constructed over 55 years ago. These constraints include the limited bearing capacity of the existing reservoir (i.e., the inability of the current reservoir and the sub-grade upon which it rests to support the load of the concrete roof system and the soil cover placed over the roof); and dam integrity and safety that could be compromised by penetrating the upstream side of the existing earth dam with numerous columns required to support the concrete roof.

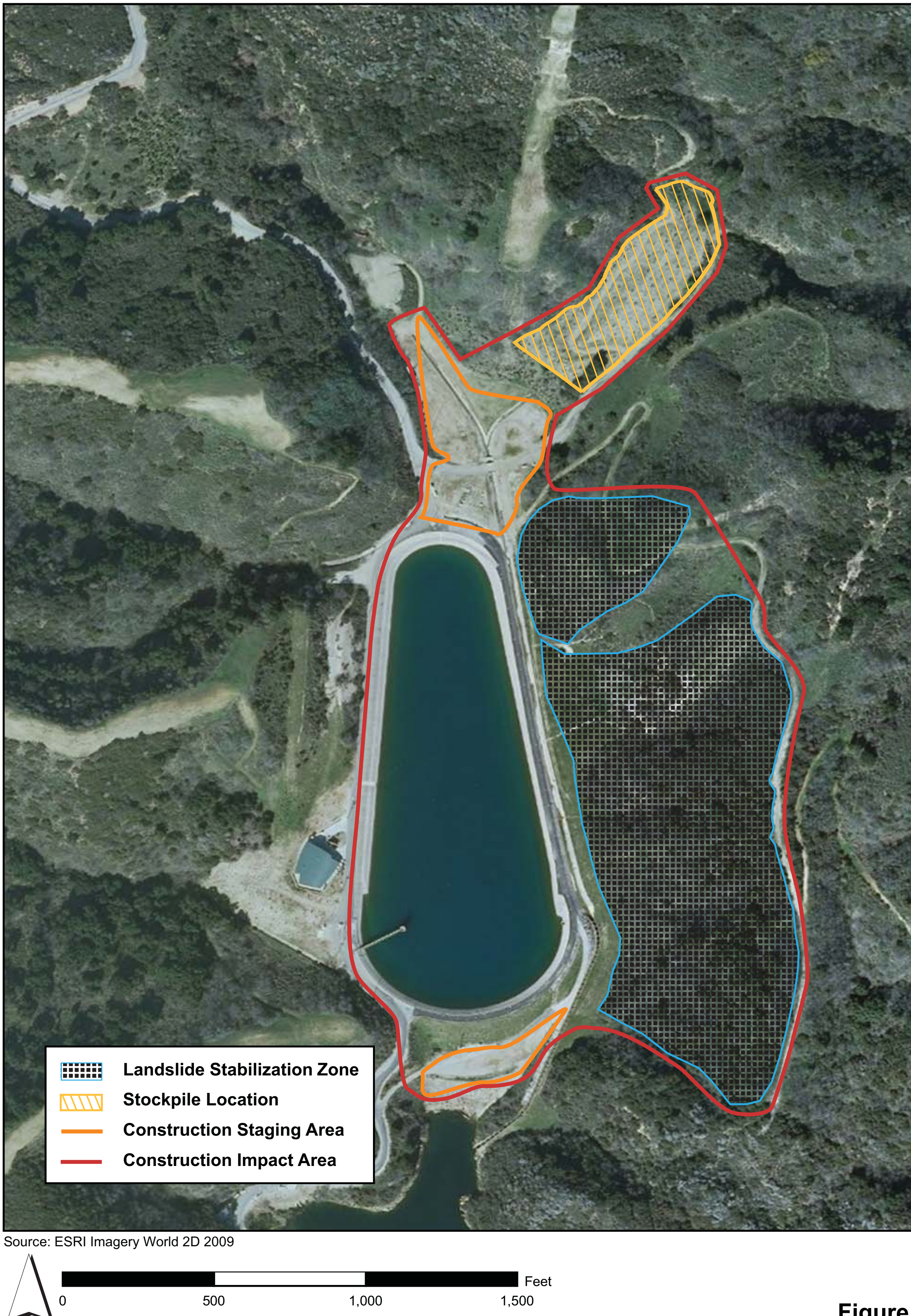


Figure 2-4
Construction Impact Areas

Therefore, to implement the proposed project, the existing Upper Stone Reservoir, including the inlet structure, outlet tower, and liner (the reservoir bottom and sides), would need to be demolished; the sub-grade beneath the reservoir would need to be stabilized to provide an adequate base to structurally support the buried reservoir; and a new perimeter concrete retaining wall would be required to support the concrete roof. The south segment of the new retaining wall would be located upstream of and functionally integrated with the existing earth dam, which would remain in place. The proposed buried reservoir would also require an impermeable liner and an extensive system of interior shear walls and columns to adequately support the roof and soil cover.

The combined weight of the buried reservoir, the water within the reservoir, and the soil layer atop the reservoir would exert tremendous downward force. If the areas below the proposed buried reservoir were not properly drained and water collected beneath, the upward force of buoyancy caused by the fluid pressure of the collected water could in turn damage the structure. Therefore, a sub-drain system would be installed beneath the buried reservoir liner to prevent water from collecting underneath. The water collected by the drain system would be directed to Lower Stone Reservoir.

The final footprint of the proposed buried reservoir would be slightly smaller than and contained within the footprint of the existing Upper Stone Reservoir, but because the side slopes and bottom would be reshaped to accommodate the required sub-grade drainage system, the total storage volume of the proposed buried reservoir would be slightly greater (by approximately 6 MG) than the existing reservoir.

Preliminary geotechnical analyses of the area surrounding Upper Stone Reservoir indicate that most areas are geologically stable and do not present a general concern relative to the proposed project. However, the slopes immediately east of the reservoir have experienced several relatively recent and moderately significant landslides (one in 1956 and two in 1969) that were caused by the adverse bedding of sedimentary layers resting on a clay soil plane. If a similar landslide were to occur in this area after the implementation of the proposed project, the buried reservoir could be seriously damaged. Because of the significant cost of the buried reservoir and because repairs necessitated by such a landslide event could remove the buried reservoir from service for a lengthy period and require major construction and investment, including entirely demolishing and rebuilding the reservoir, these potential landslide areas would need to be stabilized as part of the proposed project. The potential landslide areas encompass approximately 20 acres in three separate zones (see Figure 2-5).

Source: ESRI Imagery World 2D 2009

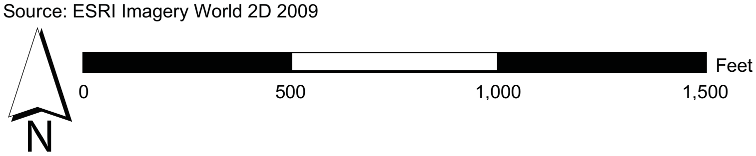


Figure 2-5
Landslide Stabilization Areas

The proposed buried reservoir would be covered with a maximum of 3 feet of topsoil and planted with native species typical of the canyon environment and surrounding area. This would help fulfill the secondary objective of the project to restore the natural character of those portions of the canyon involved in the improvements required to meet the primary water quality and water storage objectives of the project. As mentioned above, a buried structure is the only means to achieve this restoration. Nonetheless, to achieve this objective, the proposed project would require a substantial financial investment (approximately $140 million over a 60-year life cycle, the large majority of which would be initial capital costs rather than long-term maintenance expenditures). This cost would essentially be borne by the citizens of Los Angeles, who provide revenue to LADWP through the purchase of drinking water. Based on this investment by LADWP ratepayers, under the proposed project, the benefits of Upper Stone Canyon would be made available to a broader segment of the population of the City rather than merely helping to restore the natural appearance and character of the canyon. In this regard, the proposed buried reservoir project is predicated on providing public access to Stone Canyon in the form of a pedestrian trails system. Public access to Stone Canyon is a component of the proposed project based on the public investment in the buried reservoir, but it is neither a primary nor secondary objective of the project. Furthermore, public access would not be a component of alternatives to the proposed project that would not provide some form of buried water storage facility.

To provide for public access at the SCRC, pedestrian trails would be created within portions of the property. However, the SCRC is and will remain an LADWP operational complex devoted to the storage, treatment, and distribution of drinking water supplies. In addition to Upper Stone Reservoir itself, facilities related to these functions include numerous chemical storage stations required to maintain water quality and distribution system integrity. These include the new chlorination station located west of Upper Stone Reservoir and several chemical storage stations located along the roadway that runs to the west of Lower Stone Reservoir. The recently completed water filtration plant is located south of the Lower Stone Reservoir dam, and a number of appurtenant facilities related to water storage and treatment are located throughout the SCRC, including a diversion structure just north of Upper Stone Reservoir. The Los Angeles Fire Department (LAFD) also maintains a helicopter landing area just north of the reservoir. The helicopter landing area includes a fire hydrant system to obtain water for aerial firefighting. In an action not related to the proposed project, this helicopter landing area will be relocated prior to the initiation of project construction to a site approximately 750 feet north of Upper Stone Reservoir, adjacent to the SCRC access road. Upper Stone Reservoir is not used to obtain water by helicopter for aerial firefighting. However, in certain circumstances the County of Los Angeles Fire Department may use Lower Stone Reservoir to obtain water by helicopter. No changes to Lower Stone Reservoir that would affect this capability are proposed under the Upper Stone Canyon Reservoir Water Quality Improvement Project. Public access to areas within the SCRC containing these facilities would create potential safety, security, hazards, and vandalism conflicts. In addition, the primary site access road entering the site at Mulholland Drive represents a potential safety conflict because it is relatively narrow and winding and is frequently used by large trucks to deliver materials and supplies related to water operations to the SCRC facilities. Furthermore, while no longer a treated water storage facility, Lower Stone Reservoir, because it was formed by damming a natural canyon, is characterized by deep water and steep embankments along its entire perimeter, creating a potential hazard if the public was given direct access to the area surrounding the reservoir. Therefore, public access to the SCRC would be limited to a trails system that would be segregated from the operational elements of the complex and Lower Stone Reservoir by new boundary fences.

The conceptual plans for public access would entail establishing a parking area along the east side of the SCRC access road at an existing relatively level pad located approximately 0.25 miles south of the Mulholland Drive access gate. Although this proposed location of the parking area would create some potential conflicts between private vehicles and LADWP vehicles sharing this segment of the road, it would minimize the requirement for extensive fill to create a flat pad for parking along the east side of the access road, which runs adjacent to a natural drainage course between the entry gate and the proposed parking area. With relatively minimal grading, off-road parking for approximately 25 vehicles could be provided at this location. A new gate would be installed on the road just southwest of the parking area to preclude access by all but LADWP-related vehicles. A new LADWP guardhouse would be located at this gate. The guardhouse at the existing Mulholland Drive gate would be removed, but a gate to prevent after-hours (between dusk and dawn) public access to the SCRC property would remain at Mulholland Drive. No other amenities would be provided in association with the public access function.

A trailhead would be established at the parking area, and a trail would cross generally eastward in the northern portion of the SCRC and proceed southward in the eastern portion of the SCRC property. A trail would also be established starting at the parking area and proceeding southward in the western portion of the property. Both the eastern and western trail segments would provide overlook opportunities of Lower Stone Reservoir, but, as discussed above, access to the lower reservoir itself would be unavailable. Trail segments also would be established on the buried Upper Stone Reservoir itself. Access to the buried reservoir surface would be available from the eastern trail segment because no crossing of the LADWP operations road, which runs along the west side of the reservoir, would be necessary. Conversely, access to the buried reservoir surface would not be available from the western trail segment because a pedestrian crossing of the LADWP operations road would be prohibited.

New boundary fences would be selectively located to restrict access to the road along both sides from the LADWP control gate south. The fences would encompass within the LADWP operations portion of the property certain facilities located north of Upper Stone Reservoir, including the diversion structure and the LAFD helicopter landing area. The boundary fence would also establish a buffer zone around the existing chlorination station. Additional segments of fencing would be installed to prevent access to Lower Stone Reservoir where natural topographic barriers were absent. This selective placement of security fencing would prevent public access to restricted areas but still allow for wildlife movement within the SCRC, especially continued access to Lower Stone Reservoir.

The exact placement and extent of the proposed trails system would be subject to a future planning and design process involving stakeholders such as LADWP, LADRP, the Santa Monica Mountains Conservancy, and members of the communities neighboring the SCRC. For the purposes of the environmental analysis contained in this EIR, the primary issues relate to the general type, intensity, and extent of public access as it has been defined above.

2.6.1 Construction Phases

Construction of the proposed project, as described below, would take approximately 4 years to complete, and the analysis contained in this EIR related to potential environmental impacts caused by construction activity is based on this assumption. However, given the magnitude and the complex nature of project construction, and therefore the potential for unforeseen delays, the actual construction period may continue for up to 5 years. It is anticipated that construction activities would start in late 2015 and, assuming no major delays, would be completed in late 2019. For the purposes of estimating the calendar duration of the project and the monthly levels of activity related to personnel, truck deliveries, equipment operations, and earthwork, it has been assumed that, on average, 20 workdays would be available each month. This would generally account for holidays and rain days that would fall on weekdays and during which no construction activity would occur. Other than the delivery of materials and supplies to the site and the hauling of debris and excess soil from the site, all construction activities, including supplies laydown, soil excavation and stockpiling, equipment storage, and worker parking, would be confined within the SCRC boundaries (see Figure 2-4). The general truck route during construction would be between I-405 and the north SCRC entry (at Mulholland Drive) via Skirball Center Drive and Mulholland Drive. No road closures are anticipated during construction, but traffic control measures, such as flag persons, may be required at times to facilitate construction vehicle ingress and egress at the SCRC gate. During construction, drinking water would continue to be provided to the SCRC from the Van Norman Complex in Granada Hills. It would be fed to the service area from the SCRC via the 60-inch line recently installed to bypass Lower Stone Reservoir. Water supplies would be further supplemented as necessary to help temporarily meet peak demand during construction (when Upper Stone Reservoir would be out of service) with additional purchases from the Metropolitan Water District.

Construction of the buried reservoir would consist of several tasks, including mobilization; demolition; landslide stabilization; excavation and reshaping of the reservoir sides and bottom; construction of the concrete perimeter retaining walls and interior shear walls; installation of the concrete liner; construction of the concrete roof columns and roof; backfilling around and above the reservoir; and landscaping above the new structure. Each of these tasks would require truck deliveries and/or haul trips and the operation of heavy equipment, including cranes, excavators, loaders, graders, dozers, and various types of trucks. Although the construction for the buried reservoir would be continuous, for descriptive purposes, tasks can be grouped together in phases based on the general timing of their occurrence and similarities in the type of work conducted. While the tasks and phases are generally sequential in that some must precede others at a given location, a certain amount of overlap would likely occur in different locations within the project site as construction proceeds. However, the following description generally considers the tasks and phases separately as a means of describing the overall sequence of construction and establishing the general level of activity related to functions such as equipment operations, truck deliveries, worker commute trips, and earthwork in order to analyze potential environmental impacts related to the construction phase of the project. Spreadsheets that indicate the type, duration, and level of activities for the various construction tasks are included in Appendix B of this EIR.

Phase 1: Reservoir Draining, Mobilization, Reservoir Demolition, and Landslide Stabilization (4 months)

The first phase of construction would consist of draining Upper Stone Reservoir, mobilizing for construction, demolishing the existing reservoir and appurtenant facilities, and initiating the stabilization of potential landslide areas east of the reservoir. This phase would require approximately 4 months to complete. During Phase 1, the number of on-site workers per day based on a monthly average would range from a low of 17 during mobilization to a peak of 48 during the concurrent stabilization of the landslide areas and the demolition of the reservoir. The number of truck deliveries or haul trips per day based on a monthly average would range from a low of 3 during mobilization to a peak of 79 during the concurrent stabilization of the landslide areas and the demolition of the reservoir. The number of full-time operating equipment per day based on a monthly average would range from a low of 12 during mobilization to a peak of 69 during the concurrent stabilization of the landslide areas and the demolition of Upper Stone Reservoir.

Prior to initiating construction, Upper Stone Reservoir would need to be drained. This would initially be accomplished by normal consumption through the drinking water distribution system until the water level reached the lower limit of the normal operating range of the reservoir. Below this elevation, the water would be gravity drained to Lower Stone Reservoir. To maintain the stability of the earth dam located at the southern end of the upper reservoir, the rate at which the water level would be lowered would be carefully controlled. After the water reaches the lower limit of the normal operating range, it would take approximately 3 weeks to drain the remaining water from Upper Stone Reservoir and an additional 2 to 3 weeks for the reservoir to dry out. This task would involve minor numbers of equipment and personnel.

Mobilization would entail widening and stabilizing existing on-site roads as necessary for truck access during construction, preparing construction materials laydown areas and vehicle and equipment parking areas, erecting temporary offices and other support facilities, and establishing temporary electrical power connections. The laydown, office, and parking area would be located in previously disturbed areas north of Upper Stone Reservoir, where similar functions were located during the Lower Stone Reservoir project construction. This task would take approximately 1 month and would occur concurrently with draining the reservoir.

Demolition of the existing reservoir would include the removal of the reservoir’s existing asphalt liner; the inlet line; the outlet tower and line; and the surrounding curb and fence. Demolition would generate about 9,000 CY of debris, which would be hauled off site, requiring about 1,800 truck trips. The demolition task would take approximately 3 months to complete.

The preferred method to reduce the landslide risk in the potentially unstable area east of Upper Stone Reservoir is to excavate and grade the slopes to establish stability. However, the surface area of the grading necessary to achieve stability often extends considerably beyond the boundaries of the slide zone itself. The limits of this grading can be reasonably determined for only one of the three identified slide zones. In this case, approximately 3.5 acres would be graded, resulting in the excavation of approximately 46,500 CY of earth, which would include approximately 2,300 CY of topsoil (generally defined as ± 6 inches in depth) that would be removed from the area, stockpiled, and returned after excavation activities are complete to provide an appropriate medium for replanting the area. The balance of the excavated material (44,200 CY) would be hauled off site and recycled or disposed with the demolition debris. This would require about 6,400 truck trips over a 5-month period, which would extend into Phase 2.

Since the extent of grading required to achieve stability at the two remaining slide zones cannot be adequately determined at this time, soil nails would instead be employed to avoid excavation that may need to extend well above the uphill boundary of the slide zones, creating a considerably larger area of disturbance. Soil nails are steel rods that, when driven into the ground, reinforce and strengthen the slope, reducing the potential of collapse. Nails ranging in length from 15 to 75 feet would be driven into the slope at a spacing of approximately 5 feet on center. The nails would be grouted in place and would include a small steel plate at the surface to provide additional support. Approximately 20 rows of nails would be required across the combined 17 acres of the two slide zones. In order to install the nails, several temporary parallel roads across the slope would be necessary to provide access for heavy equipment. The area around each nail would also need to be cleared of vegetation. Excavation and grading in limited areas may also be necessary within these two slide zones to provide stability. Approximately 2,400 CY of topsoil would be temporarily removed from the area and stockpiled, to be returned after stabilization activities are complete to provide an appropriate medium for replanting in disturbed areas. The landslide stabilization task would take a total of approximately 5 months to complete, the first 3 months of which would take place concurrently with the reservoir demolition task during Phase 1.

Phase 2: Landslide Stabilization, Reservoir Rough Shaping, Retaining Wall Excavation, and Sub-Grade Excavation and Preparation (12 months)

The second phase of reservoir construction would involve completing the landslide stabilization task and excavating and preparing the sub-grade below the buried reservoir to adequately support the load of the concrete roof system and the soil cover. A new inlet line to the buried reservoir and outlet line from the reservoir would also be constructed during this phase. The entire phase would require approximately 12 months to complete. During Phase 2, the number of on-site workers per day based on a monthly average would range from a low of 28 to a peak of 67. The number of truck deliveries or haul trips per day based on a monthly average would range from a low of 4 to a peak of 49. The number of full-time operating equipment per day based on a monthly average would range from a low of 39 to a peak of 67.

The landslide stabilization task would continue for the initial 2 months of Phase 2 until complete. It would involve the same type of activity as described for the task under Phase 1.

In order for the sub-drain system installed beneath the buried reservoir to function properly, the bottom of the reservoir could not exceed a slope of five horizontal units to each vertical unit (5h:1v). This would require reshaping the outer portions of the existing upper reservoir bottom, which currently slope at approximately 2.5h:1v (twice the maximum slope required for the sub-drain system to function properly). The reshaping of the reservoir bottom would create approximately 118,500 CY of excavated material. Approximately 32,500 CY of material would also be excavated to allow space for the construction of the buried reservoir perimeter retaining walls during Phase 3 of construction. This excavated material would be stockpiled on site until needed during later phases of construction. The stockpile area would be an approximately 3-acre site located northeast of Upper Stone Reservoir (see Figure 2-4). This area was previously disturbed and revegetated as part of the Lower Stone Reservoir water quality improvements and would again be revegetated at the completion of the proposed project as described in Task 4 below. As part of construction, this stockpile area would need to be cleared and properly engineered to stabilize slopes and provide for appropriate drainage. The stockpiled material would be protected throughout project construction by stabilizing exposed areas and providing barriers to minimize runoff, erosion, and sedimentation.

Portions of Upper Stone Reservoir rest directly on bedrock material capable of supporting the proposed buried reservoir, while other portions rest on soil layers above bedrock, which are incapable of adequately supporting the proposed reservoir. Preparation of the sub-grade would include excavating these soil layers, mixing the excavated soil with cement, and placing the soil-cement mixture in the previously excavated areas to provide a structurally sound base for the new reservoir. This task would require approximately 5 months and would entail excavating, mixing, and returning approximately 212,000 CY of soil. This activity would occur entirely within the existing Upper Stone Reservoir footprint, except for approximately 10,500 CY of unusable material, which would be placed in the stockpile area. In addition, approximately 46,500 CY of the excavated material previously placed in the stockpile area during rough shaping would be returned to the area to build up the buried reservoir bottom at the south end, where the new retaining wall would be functionally integrated with the existing earth dam. This fill material would also be mixed with cement to provide a solid base for the buried reservoir. The delivery of the dry cement to the SCRC during this phase would require a total of approximately 1,250 truck trips over a 5-month period. This method of reinforcing the sub-grade eliminates the requirement to construct an extensive foundation system of drilled caissons to support the proposed concrete roof and soil cover.

Phase 3: Concrete Reservoir and Sub-Drain System Construction (27 months)

The third phase of the project would involve the construction of the new concrete reservoir, including the perimeter retaining walls and interior shear walls, liner and sub-drain system, and column and roof assembly (see Figures 2-6 and 2-7). The entire phase would require approximately 27 months to complete. During Phase 3, the number of on-site workers per day based on a monthly average would range from a low of 48 to a peak of 107. The number of truck deliveries or haul trips per day based on a monthly average would range from a low of 20 to a peak of 57. The number of full-time operating equipment per day based on a monthly average would be 20 throughout the phase.

Because the elevation of the outer portions of the bottom of the buried reservoir would be lowered during Phase 2 to allow for proper operation of the sub-drain system, a new concrete retaining wall approximately 23.5 feet in height would be required around the entire perimeter of the reservoir to retain the water. To provide adequate access along both sides to construct the retaining wall, the wall would generally be located slightly inward from the upper edge of the existing upper reservoir. However, at the southern end of the reservoir, where the retaining wall would be functionally integrated with the existing earth dam, it would be located inward of the toe of the slope of the dam, approximately 125 feet inward from the top of dam of the existing upper reservoir based on preliminary plans. (The area between the new retaining wall and the existing dam would be backfilled with soil during Phase 4 of construction.) Although this configuration of the retaining walls would reduce the overall footprint of the reservoir, the storage volume of the new structure would actually increase by about 6 MG to a total of 144 MG. This is because the buried reservoir sides and bottom would have been reshaped during Phase 2 to permit the sub-drain system to function properly. This configuration would allow for a greater balancing of cut and fill material on site than would be possible if the wall were located closer to the top of the existing dam.

In addition to the perimeter retaining walls, a series of shear walls would be constructed in the interior of the buried reservoir to help support the load of the concrete roof and soil cover and to resist inertial loads that may be created by seismic events (see Figures 2-6 and 2-7). To adequately provide the structural support for the buried reservoir, the retaining and shear walls would be a minimum of 24-inch thick reinforced concrete. Together, the walls would require about 42,000 CY of concrete, which would be delivered to the site over an approximately 7-month period, requiring about 5,750 truck trips.

To help adequately support loads and prevent seepage, the liner of the buried reservoir would be 7.5-inch thick reinforced impermeable concrete. The liner would be constructed in 25-foot by 25-foot sections, with all joints between sections sealed with water-stop elements. The buried reservoir liner would require approximately 22,500 CY of concrete, which would be delivered to the site over an approximately 8-month period, requiring about 3,100 truck trips. Prior to constructing the liner, a sub-drain system consisting of multi-branched drain lines set within a 12-inch thick gravel bed would be installed beneath the entire reservoir. The drainage system would require approximately 21,000 CY of gravel, which would be delivered to the site over an approximately 13-month period, requiring about 2,100 truck trips.

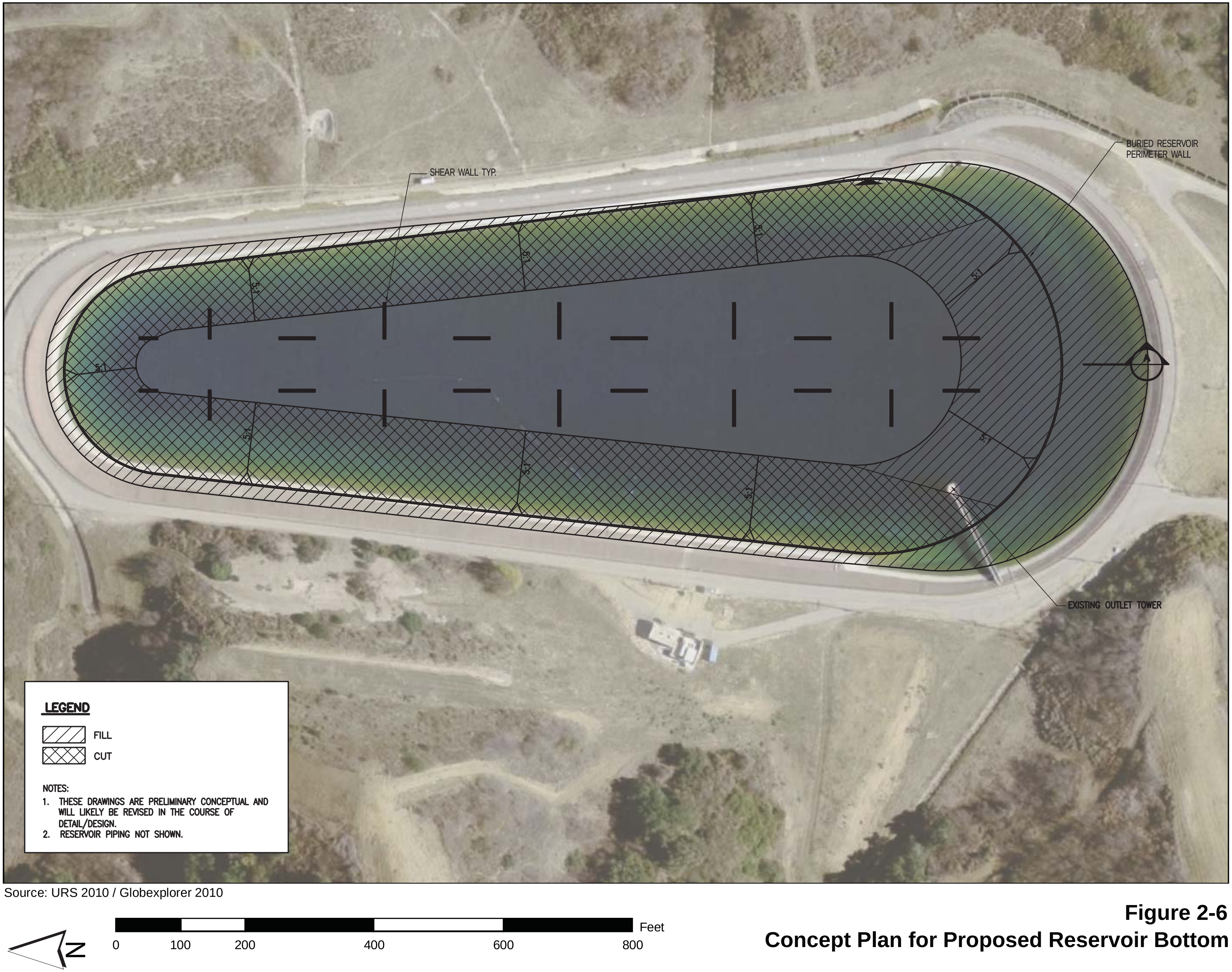
In addition to the perimeter and shear walls, an extensive system of columns would be required to support the reservoir roof and soil cover (see Figure 2-7). The columns would be set in a grid pattern at 25 feet on-center within the reservoir. They would be cylindrical 2-foot diameter reinforced concrete, with a spread footing integrated into the reservoir liner and a concrete cap to support the reservoir roof. The roof would be 12-inch thick reinforced concrete constructed in 25-foot by 25-foot sections, centered over individual columns and with all joints between sections sealed with water-stop elements. The buried reservoir column and roof system would require approximately 28,000 CY of concrete, which would be delivered to the site over an approximately 12-month period, requiring about 3,800 truck trips.

During Phase 3, excavated material that would be unsuitable for use as compacted fill related to various purposes in the buried reservoir construction would be hauled off site. It is estimated that approximately 5 percent of all the material excavated during the various construction tasks would be unusable rock rubble. This would represent about 18,000 CY of material, the hauling of which would require approximately 1,800 truck trips over a 3-month period.

Phase 4: Backfilling and Landscaping (2 months)

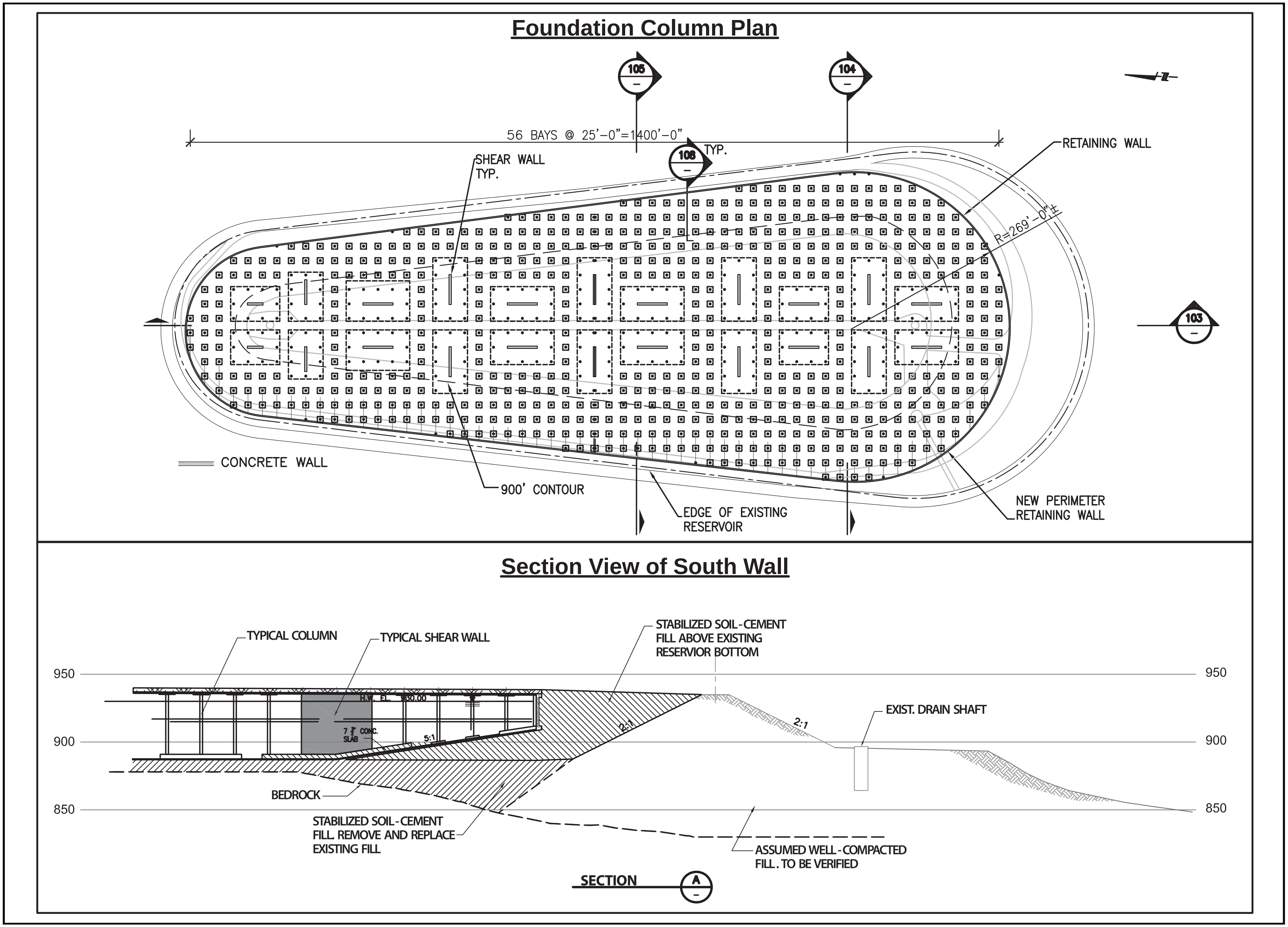
The fourth phase of construction would consist of backfilling behind the retaining walls, including the area between the wall at the south end of the buried reservoir and the existing earth dam. This phase would also include covering the reservoir with topsoil and site landscaping. It would require 2 months to complete. The number of on-site workers per day would average about 47, the number of truck deliveries or haul trips per day would average about 163, and the number of full-time operating equipment per day would average about 16.

A portion of the soil placed in the on-site stockpile (approximately 46,500 CY) would have been previously used during Phase 2 to build up the buried reservoir bottom below the south end retaining wall, and another portion (approximately 18,000 CY) would have been hauled off site during Phase 3 as material unusable for compacted fill. The balance of the on-site stockpile material (approximately 86,500 CY) would be used to backfill behind the retaining walls of the new reservoir, including the area between the new concrete retaining wall at the south end of the reservoir and the earth dam of the existing Upper Stone Reservoir. After completion of the backfilling, the buried reservoir would take approximately 1 month to refill.



Source: URS 2010 / Globexplorer 2010

Figure 2-6
Concept Plan for Proposed Reservoir Bottom



Source: URS 2010

Figure 2-7
Section and Expanded Side Wall

Approximately 64,000 CY of imported topsoil would be required to provide a maximum of 3-feet of appropriate planting medium for the area above the buried reservoir. This topsoil importation would require approximately 6,400 truck trips over the 2-month period. In addition to planting the area above the reservoir with native plant species typical of the SCRC property and the surrounding area, Phase 4 would include planting other areas on site that were exposed during construction. This would involve approximately 16 acres above the reservoir itself, 20 acres for the landslide stabilization area east of the reservoir, and 3 acres for the area utilized for material stockpiling. The landscaping would include a combination of seeding and individual specimens, both shrubs and trees. However, to avoid potential structural damage, planting in the area above and immediately surrounding the buried reservoir would be limited to grasses, herbaceous species, and shallow-rooting shrub species. Maintaining soil cover on restored areas may require netting or other temporary physical measures to anchor the soil and protective mulch until plants become established. Quickly-germinating "nurse crops" may also be used to provide temporary erosion control while permanent plant species can establish. A temporary irrigation system would be installed to ensure successful establishment of new plant material.

Phase 5: Trails Improvements (3 months)

The construction of the trails improvements at the SCRC would involve clearing, grading, stabilizing, and marking the public parking area; installing the new boundary fences and gates; clearing, grading, and stabilizing trails; installing trail signs; and constructing overlook areas. This phase of work would take approximately 3 months to complete. An average of 4 pieces of equipment would be on site throughout this phase. Delivery trips to the site would not exceed 4 on any day. An average of approximately 12 personnel would be on site throughout the phase.

2.6.2 Project Operations

The new water storage facilities would not create the need for LADWP personnel to be located permanently on site. LADWP operations on site would involve maintenance of the buried reservoir, pipelines, and ancillary elements at a similar level of activity as current operations at Upper Stone Reservoir. These operations would generate minimal traffic to and from the site, similar to current levels.

The SCRC property would remain under the ownership of LADWP, which would continue to have the primary maintenance responsibilities at the site, but the operation and maintenance related to the trails access function would be the responsibility of LADRP and/or the Santa Monica Mountains Conservancy. The trails would be open to pedestrians only. Bicyclists could access the SCRC as far as the parking area, but no bicycles would be allowed on the trails themselves. Public access would be provided during daylight hours only, and the gate at the Mulholland Drive entrance to the site would be opened in the morning and closed at dusk. Formal picnic areas would not be provided. Smoking and any type of fires, whether a camp fire or the use of a cooking stove, would be prohibited. Informational and regulatory signage would be posted at the parking area and along the trails. As discussed above, no other amenities would be provided in association with the public access function. Parking would be provided for approximately 25 vehicles for trails users. The parking area would permit vehicles to be parked entirely off the road surface to minimize conflicts with LADWP delivery vehicles. Parking along the access road itself would be prevented with a combination of signs and barriers.

In order to assess potential environmental impacts related to public access at the SCRC, several assumptions have been made as follows regarding the anticipated level of visitor use of the trails system based on a maximum number of 25 parking spaces. Based on the availability of parking and on general neighborhood access, in comparison to other locations in the Santa Monica Mountains near Stone Canyon that offer similar recreation experiences (e.g., Franklin Canyon Park and Runyon Canyon Park, which are located approximately 3 and 5.5 miles east of Stone Canyon, respectively), the number of parking spaces that would be provided at the SCRC to support trail access would represent a limiting factor related to the number of visitors that might be expected. The level of use would vary between weekend days and weekdays. On weekend days, the average occupancy for vehicles would be 1.5 people. This would result in a peak use of about 38 visitors on site at a single time, assuming the parking area was fully occupied. However, the parking area would not be expected to be fully occupied throughout the day. Given the nature and size of the proposed trails elements, visitors would be expected to stay approximately 1 to 2 hours at the SCRC, and there would be a turnover of visitors leaving and entering the site during the day. Based on such factors as weather and holidays, the rate of this visitor turnover may vary considerably from weekend to weekend throughout the year, but an average rate of 2 full turnovers per weekend day has been assumed (i.e., 50 visitor vehicles would enter and leave the site during the day). Based on the assumed average vehicle occupancy of 1.5, this turnover rate would result in an average of 75 visitors per day at the SCRC on weekends. As on weekend days, the rate of visitor turnover on weekdays may vary considerably from week to week throughout the year, but the average turnover rate on a weekday is assumed to be half that of a weekend day (i.e., 25 visitor vehicles would enter and leave the site during the day). The average occupancy of vehicles would be greater than 1 but less than the 1.5 average for weekend days, resulting in an average occupancy of 1.25 people per vehicle. This turnover rate and vehicle occupancy would result in an average of 31 visitors per day at the SCRC on weekdays. Based on these factors, an average of approximately 16,000 recreation users would visit the SCRC on an annual basis.

2.6.3 Best Management Practices

An appropriate combination of monitoring and resource impact avoidance would be employed during all phases of the proposed project, including implementation of the following Best Management Practices:

- The proposed project would implement Rule 403 dust control measures required by the South Coast Air Quality Management District (SCAQMD).
- Active grading areas would be watered at least twice daily and as necessary to reduce dust during construction activities.
- The construction contractor would develop and implement an erosion control plan and a Storm Water Pollution Prevention Plan for construction activities. Erosion control and grading plans would include but would not be limited to:
    1) minimizing the extent of disturbed areas and duration of exposure;
    2) stabilizing and protecting disturbed areas;
    3) keeping runoff velocities low;
    4) retaining sediment within the construction area.
- Construction erosion control Best Management Practices may include the following:
    1) temporary desilting basins;

2) silt fences;
3) gravel bag barriers;
4) temporary soil stabilization with mattresses or mulching;
5) temporary drainage inlet protection; and
6) diversion dikes and interceptor swales.

- Environmentally sensitive areas would be fenced and avoided except for those areas where project facilities or functions are planned, including those related to construction activities.
- The proposed project would comply with the Regional Water Quality Control Board's National Pollution Discharge Elimination System Phase II Rule.
- Construction would comply with the City of Los Angeles Noise Ordinance, which limits the hours of construction to between 7:00 a.m. and 9:00 p.m., Monday through Friday, and between 8:00 a.m. and 6:00 p.m. on Saturday. No construction would occur on Sundays or City holidays.
- The proposed project construction would incorporate source reduction techniques and recycling measures and maintain a recycling program to divert waste in accordance with the Citywide Construction and Demolition Debris Recycling Ordinance.
- Residences and businesses near the project site and along delivery/haul routes would be notified prior to the start of construction (e.g., via flyers). The notices would include a telephone number for comments or questions related to construction activities.
- As part of the haul permit, a cash bond or surety bond would be paid at the outset of project construction for road repair and street sweeping during the construction period.
- LADWP and the construction contractor, in accordance with the Los Angeles Public Safety Code, shall implement fire prevention procedures during project construction, which would include such measures as fire safety training of all construction workers, on-site water trucks for rapid response, equipping construction equipment with spark arresters, prohibition of smoking, appropriate vegetation clearance areas around all construction zones, and stopping construction during red flag warning conditions. The construction contractor shall provide fire prevention monitors during the duration of construction to ensure compliance with required procedures.

2.7 Intended Uses of the EIR

An EIR is a public document used by a public agency to analyze the environmental effects of a project and to disclose possible ways to reduce or avoid significant environmental impacts, including alternatives to the proposed project (CEQA Guidelines Section 15121). As an informational document, an EIR does not make recommendations for or against approving a project. The main purpose of an EIR is to inform governmental decision makers and the public about potential environmental impacts of the project. This EIR will be used by LADWP, as the lead agency under CEQA, in making decisions with regard to the adoption of the proposed project described above, the subsequent construction and operation of the proposed project, and the related approvals described herein.

2.8 Project Approvals

LADWP is the project lead agency pursuant to CEQA Guidelines Section 15367. Numerous approvals and/or permits would be required to implement the Upper Stone Canyon Reservoir Water Quality Improvement Project. The environmental documentation for the proposed project would be used to facilitate compliance with federal and state laws and the granting of permits by various state and local agencies having jurisdiction over one or more aspects of the proposed project. These approvals and permits may include the following:

City of Los Angeles Department of Water and Power

- Certification by the Board of Water and Power Commissioners that the EIR was prepared in accordance with CEQA and other applicable codes and guidelines
- Approval of the proposed project or an alternative to the proposed project, including a No Project alternative
- Approval of an agreement between LADWP and LADRP and/or the Santa Monica Mountains Conservancy for the lease, operations, maintenance, and security for the trails access aspects of the project

City of Los Angeles Department of Recreation and Parks

- Approval by the Board of Commissioners the City of Los Angeles Department of Recreation and Parks of an agreement between LADWP and LADRP for the lease, operations, maintenance, and security for the trails access aspects of the project

City of Los Angeles Department of Public Works, Bureau of Engineering

- Excavation Permits

City of Los Angeles Department of Building and Safety

- Grading Permit
- Haul Route Permits

City of Los Angeles Department of Public Works, Flood Control

- Discharge Permit for construction dewatering and hydrostatic test water discharge in storm system and channel

State of California Department of Water Resources, Division of Safety of Dams

- Approval of plans and specifications for the modification of a dam and reservoir

State of California Los Angeles Regional Water Quality Control Board

- National Pollution Discharge Elimination System Permit for Construction Dewatering
- National Pollution Discharge Elimination System Permit for Hydrostatic Test Water Discharge

CHAPTER 3
ENVIRONMENTAL SETTING, IMPACTS AND MITIGATION

The following chapters include an analysis, by issue area, of the proposed project's potential effects on the environment. Each environmental issue area chapter includes the following subsections as applicable:

- Environmental Setting
- Regulatory Setting (where appropriate)
- Environmental Impacts
- Mitigation Measures
- Significance After Mitigation

The mitigation measures provided are proposed by LADWP, unless otherwise noted. The environmental issue areas analyzed in the following chapters include:

- Aesthetics (Chapter 3.1)
- Air Quality/Greenhouse Gas Emissions (Chapter 3.2)
- Biological Resources (Chapter 3.3)
- Cultural Resources (Chapter 3.4)
- Wildland Fire (Chapter 3.5)
- Noise (Chapter 3.6)
- Transportation and Traffic (Chapter 3.7)

As identified in the Initial Study prepared in June 2008, the following are the environmental issue areas that were not found to be significantly impacted by the proposed project:

- Agricultural Resources
- Geology and Soils
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Land Use and Planning
- Mineral Resources
- Population and Housing
- Public Services
- Recreation
- Utilities and Service Systems

Chapter 4 includes a brief discussion of impacts that were not found to be significant.

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CHAPTER 3.1
AESTHETICS

The purpose of this chapter is to identify and evaluate key aesthetic resources related to the project site and the visually accessible surrounding area and to determine the degree of impacts to such resources that would be attributable to the proposed project. The analysis describes the potential aesthetic effects of the proposed project on the existing landscape and built environment, focusing on the compatibility of the proposed project with existing conditions and its potential effect on visual resources.

3.1.1 Environmental Setting

Project Setting

The SCRC is located in the Santa Monica Mountains just south of Mulholland Drive, between Roscomare Road and Beverly Glen Boulevard within the Bel Air and Beverly Glen neighborhoods of the City of Los Angeles. It is surrounded primarily by low and very-low density single-family residential uses, with some multi-family residential uses and some vacant land. Single-family homes abut most of the western property boundary. These homes sit along the ridge at the top of Stone Canyon, with backyards adjoining the SCRC property boundary. The northern property boundary of the SCRC abuts primarily vacant land, but several homes located south of Mulholland Drive nonetheless have views of the SCRC. Single-family residential uses also abut small sections of the eastern boundary, including along the north-central portion of the boundary, generally parallel with Upper Stone Reservoir. Similar to the west side, these homes sit along the ridge at the top of the canyon with backyards and homeowners association property adjoining the SCRC property boundary. Residential uses also abut the SCRC property along its southern boundary, but these uses do not generally possess a view of Upper Stone Reservoir. In general, the surrounding uses are separated from the SCRC by chain link fencing. Some property owners have installed additional fencing between their properties and the SCRC. Figures 3.1-2 through 3.1-7 show photographs of the project site and surrounding area from within the SCRC (Figure 3.1-1 is a key for the photograph locations).

A public overlook is located along Mulholland Drive approximately 0.75 miles east of the SCRC property entrance, near Nicada Drive. It is part of the Santa Monica Mountains Conservancy amenities located along the north and south sides of Mulholland Drive. A paved parking area that accommodates eight vehicles is located directly adjacent to Mulholland Drive. The overlook faces the SCRC property to the south, providing views of Stone Canyon, the adjacent residential communities, and somewhat distant views of portions of Upper and Lower Stone Reservoirs (see Figure 3.1-4). In order to see the surface of either Upper or Lower Stone Reservoir, visitors must walk along a paved path approximately 200 feet to the west of the parking lot to access the actual overlook. From this viewpoint, Upper Stone Reservoir is visible in the middle ground of the view, with a small portion of Lower Stone Reservoir visible in the background. Upper Stone Reservoir is more visible than Lower Stone Reservoir not just because of the distance from the viewer but because the upper reservoir side walls stand out against the backdrop of the canyon vegetation. However, Upper Stone Reservoir is not a dominant visual element within the broad view of Stone Canyon from the overlook.

Project Site

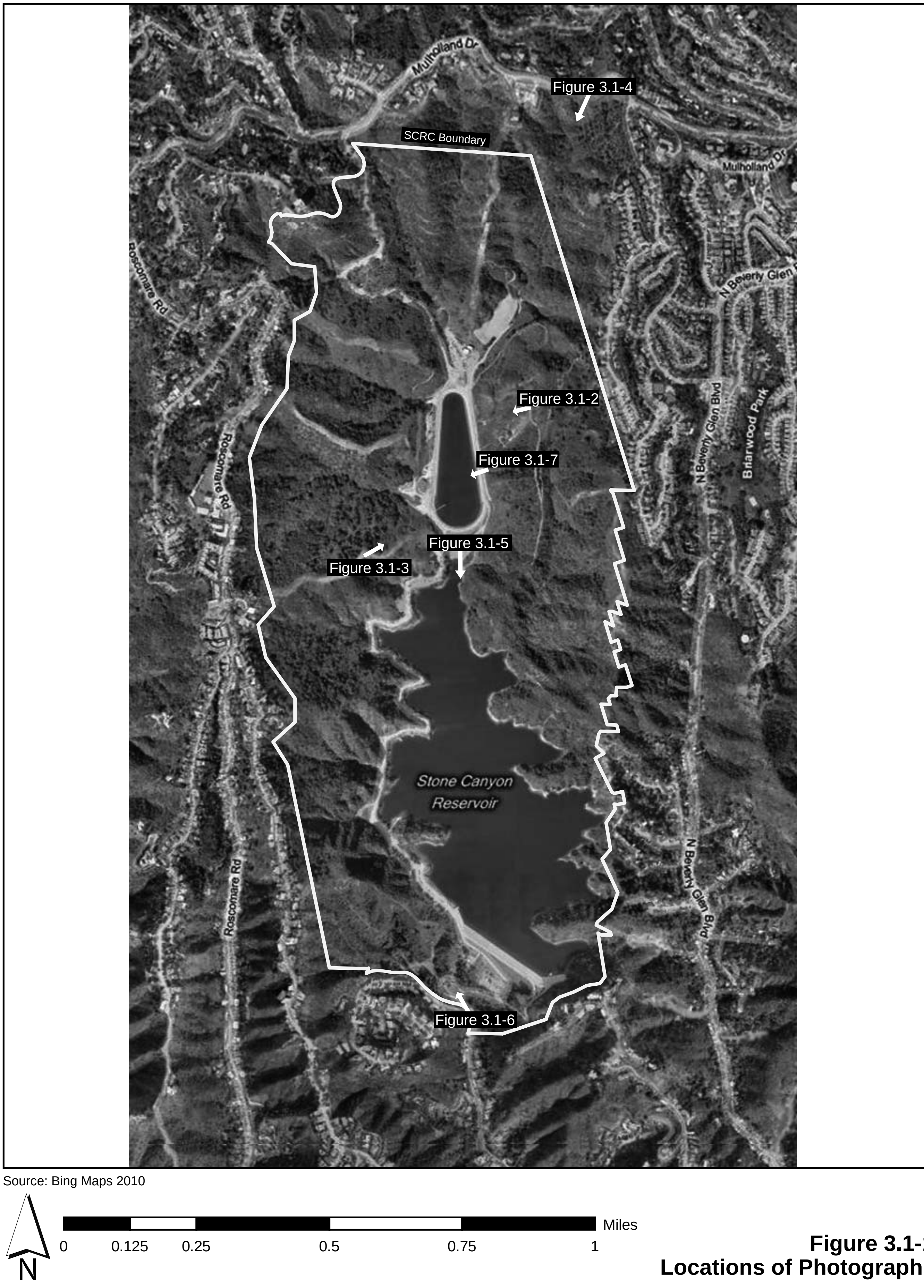
The project site is located within the approximately 750-acre SCRC property, which includes both Upper and Lower Stone Reservoirs. The SCRC property includes a mix of undeveloped hillsides and manmade facilities associated with the storage, treatment, and distribution of drinking water.

The original Stone Canyon Reservoir, now referred to as Lower Stone Reservoir, was created in 1921 by damming the canyon and providing water through pipelines from upstream supplies. Because it was created by damming the natural canyon, it has an irregularly-shaped edge that gives it the appearance of a lake (see Figure 3.1-5). Lower Stone Reservoir has been closed as a potable water storage facility, but still stores approximately 3.4 billion gallons of non-potable water. It has a surface area of approximately 138 acres. An approximately 30-foot wide paved road runs along the west side of Lower Stone Reservoir. This road provides access between the Mulholland Drive gate on the north end of the SCRC and the southern entry gate off of Stone Canyon Road.

A water filtration plant is located south of Lower Stone Reservoir (see Figure 3.1-6). The filtration plant was constructed in 2007 as part of LADWP's efforts to comply with the 1989 Surface Water Treatment Rule. The water filtration plant provides limited potable water supplies and is used partially to regulate the water level within Lower Stone Reservoir. Based on the negotiations with the surrounding community, the Lower Stone water filtration plant was built into the hillside at the lower end of the canyon, and grass was planted on a portion of the roof in order to make the facility less visible against the backdrop of the canyon.

A former dam keeper's house is also located south of Lower Stone Reservoir. It is a single-story wood-clad structure painted beige with dark brown trim. A combination dirt and paved surface parking lot is located adjacent to the former dam keeper's house. In addition to these facilities, chemical storage tanks and eye wash stations are located throughout the lower portion of the SCRC along the Lower Stone Reservoir perimeter road.

In contrast to Lower Stone Reservoir, Upper Stone Reservoir is an entirely manmade feature in both structure and appearance. The approximately 14-acre reservoir is tear drop shaped and contains approximately 138 MG of drinking water. Upper Stone Reservoir has continuous, straight edges, tapering in width at the north end (see Figures 3.1-2, 3.1-3, and 3.1-7). An outlet tower approximately 15 feet in diameter projects above the water surface approximately 30 feet near the southwest corner of Upper Stone Reservoir. The tower is connected to the perimeter road by an approximately 140-foot long footbridge. The water level in Upper Stone Reservoir can fluctuate considerably depending on water demand and other factors, exposing or concealing more of the asphalt side walls. Upper Stone Reservoir is surrounded by an approximately 3-foot tall concrete parapet wall. An approximately 8-foot tall chain link fence sits atop the parapet wall. The perimeter of Upper Stone Reservoir is surrounded by an approximately 15- to 20-foot wide paved maintenance road. A chlorination station is located on the west side of Upper Stone Reservoir. This chlorination station was completed in 2007 as part of the Stone Canyon Water Quality Improvement Project. It is a concrete structure with a green corrugated metal roof (see Figure 3.1-7).



Source: Bing Maps 2010

Figure 3.1-1
Locations of Photographs

Figure 3.1-2 Upper Stone Reservoir and residential uses located on west property boundary

Figure 3.1-3 Upper Stone Reservoir and residential uses located on east property boundary

Figure 3.1-4 Santa Monica Mountains Conservancy Nicada Overlook on Mulholland Drive

Figure 3.1-5 View of Lower Stone Reservoir from within SCRC

Figure 3.1-6 Lower Stone Reservoir water filtration plant

Figure 3.1-7 Upper Stone Reservoir outlet tower and chlorination station

A cleared area that was used for staging during the recent Stone Canyon Water Quality Improvement Project construction project is located immediately to the north of Upper Stone Reservoir. A small dirt parking area is located south of the dam for Upper Stone Reservoir. The remainder of the SCRC is essentially undeveloped. It contains moderate to steep slopes that make up the canyon walls. The sides of the canyon are vegetated with a mix of scrub and trees. Fire breaks, within which scrub vegetation has been removed, are located along selected ridgelines within the SCRC property.

Chain link fence generally surrounds the SCRC to denote the property line. A black decorative metal gate and low stone wall are located at the property entrance on Mulholland Drive. A small guard station is located directly inside the SCRC gate. Access to the SCRC property is restricted to LADWP employees and their contractors.

Viewpoints

The restricted access to the SCRC limits the public views of Upper Stone Reservoir. Due to the location of Upper Stone Reservoir within a canyon and the surrounding terrain and vegetation, there are no views of the reservoir to motorists traveling on Mulholland Drive. Public views of the project site are limited to the Santa Monica Mountains Conservancy Nicada Overlook, located on Mulholland Drive about 0.75 miles east of the SCRC gate. However, Upper Stone Reservoir is partially visible from many of the adjacent properties surrounding the SCRC boundaries, particularly those properties that sit along the ridgelines above the canyon. Thus, the visual analysis includes both public and private views. Figure 3.1-8 shows the locations of the key viewpoints contained within this analysis.

Figure 3.1-9 shows the view from Key Viewpoint 1, the public view of Upper Stone Reservoir from the Nicada Overlook. This view is directed southward down the canyon from the overlook. The undeveloped hillsides within the SCRC property and adjacent private properties are prominent in the foreground, middle ground, and background views. Upper Stone Reservoir is visible in the middle ground of the view. The surface of the water contained with the reservoir, the outlet tower and footbridge, the sidewalls of the reservoir, and the perimeter road are all visible. Only a small portion of Lower Stone Reservoir is visible south of the upper reservoir. Given the expansiveness of the view of the canyon, the reservoirs are not dominant visual elements.

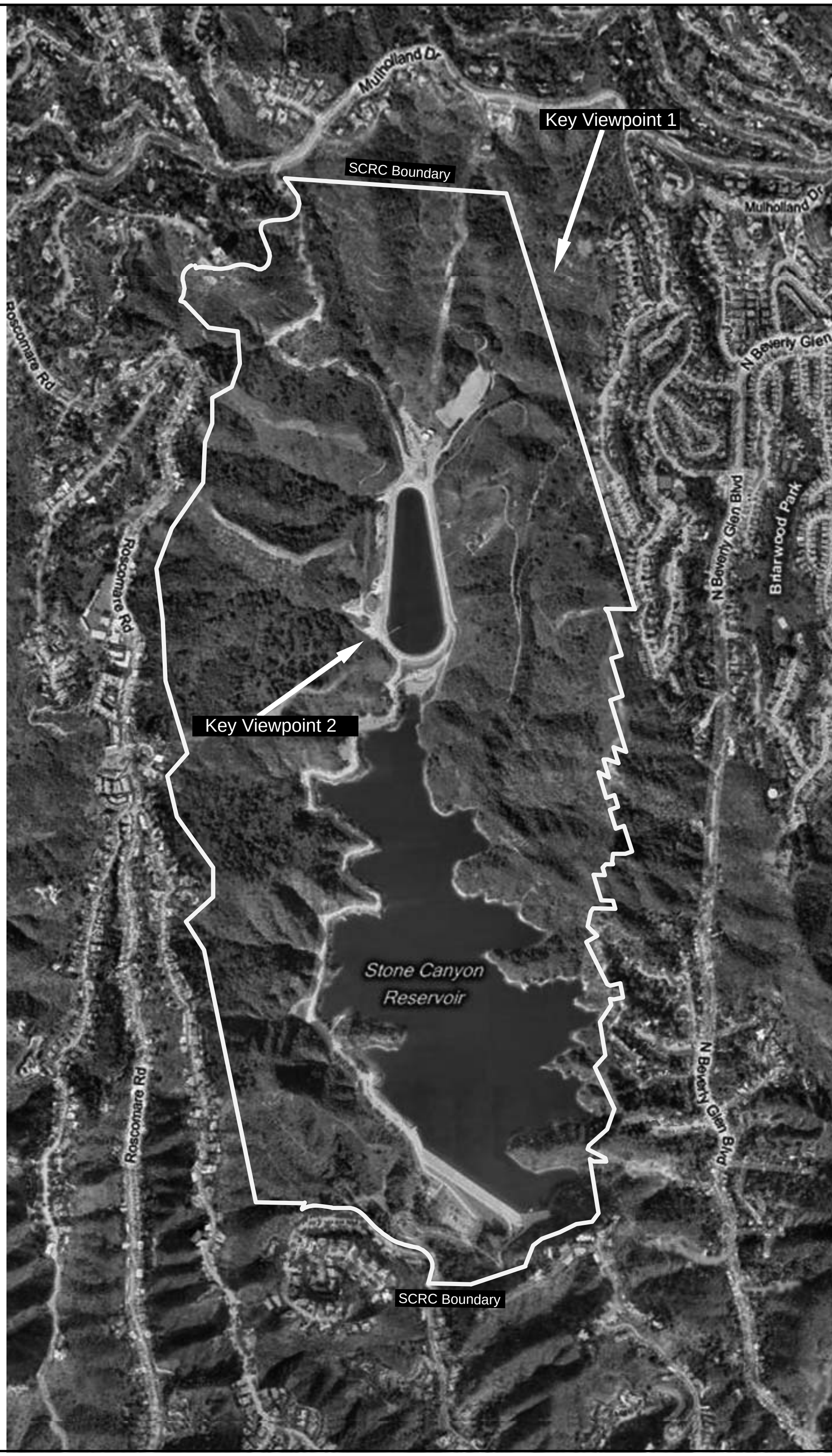
As previously mentioned, there are no other public views of Upper Stone Reservoir. The remaining views are entirely private and are experienced by the adjacent property owners located along the surrounding ridgelines. However, not all of the adjacent properties have views of the upper reservoir surface because of intervening terrain and vegetation. In order to assess the number, location, and extent of the views available to the upper reservoir surface, a viewshed analysis was conducted.

As part of the viewshed analysis, Upper Stone Reservoir was divided into sections to determine which portions of the reservoir are visible from various viewpoints. Based on the topography of the canyon and using Geographic Information System (GIS) software, the views from surrounding properties to the reservoir were modeled. This viewshed analysis did not account for vegetation, fencing, and other structures that may block a view from the property line to the reservoir. Thus, the viewshed analysis was used to conservatively determine the properties likely to have some view of the surface of Upper Stone Reservoir and guide the selection of private viewpoints. The results of viewshed analysis are contained in Appendix C of this EIR.

Based on the viewshed analysis, it was determined that no individual private property has an unobstructed view of the entire surface of Upper Stone Reservoir due to terrain. Vegetation and structures would further limit these views. Except for approximately 10 properties located northeast of Upper Stone Reservoir, which have views of the northwestern portion of the reservoir, no properties along the eastern boundary of the SCRC have a view of the upper reservoir. A few properties located north and northwest of Upper Stone Reservoir also have views of a portion of the reservoir. However, the majority of views of Upper Stone Reservoir are experienced from those properties located generally west of the reservoir. Approximately 30 properties located in this general area have views of the southernmost portion of Upper Stone Reservoir, and many properties have a view of most of the reservoir. A handful of properties located southwest of Upper Stone Reservoir can see the eastern sections of the reservoir.

Because the greatest concentration of properties with views of some portions of Upper Stone Reservoir is located to the west, this area was selected to represent a typical private view of the upper reservoir (Key Viewpoint 2 on Figure 3.1-8). The actual view of Upper Stone Reservoir, the canyon surrounding it, adjacent residential development, and distant background elements will vary depending on the exact location of the viewpoint surrounding Upper Stone Reservoir. However, the selected viewpoint typifies views of Upper Stone Reservoir for the purposes of visual resource impact assessment.

As seen in Figure 3.1-10, Key Viewpoint 2 is a view from the border of the property west-southwest of Upper Stone Reservoir, looking east-northeast across the canyon. Upper Stone Reservoir is visible in the middle ground of this view. There are only views of the central portions of Upper Stone Reservoir from this vantage point. Neither the southern end nor the northwest corner of Upper Stone Reservoir is visible, and there is limited visual access to the northeast corner. The chlorination station, perimeter road, and sidewalls of Upper Stone Reservoir are visible. Background views of the residential neighborhoods located on the eastern side of the SCRC property are also provided. The vegetation on the hillsides in the canyon is prominent in both the foreground (in front of Upper Stone Reservoir) and the background (behind Upper Stone Reservoir). The Verdugo Mountains and San Gabriel Mountains are also visible in the distance. Upper Stone Reservoir itself, within the context of the canyon, does not represent the dominant visual element.



Source: Bing Maps 2010

N

0 0.125 0.25 0.5 0.75 1 Miles

Figure 3.1-8
Location of key viewpoints

Figure 3.1-9 Key Viewpoint 1: View from Nicada public overlook on Mulholland Drive

Figure 3.1-10 Key Viewpoint 2: View from property boundary west-southwest of Upper Stone Reservoir

3.1.2 Environmental Impacts

Methodology for Assessing Visual Impact

A sequence of steps was followed to assess the proposed project's potential to create significant adverse aesthetic impacts. First, primary public and private viewpoints of the reservoir site were established based on the general visibility of Upper Stone Reservoir from the viewpoints. Second, computer generated photo-simulations of the proposed project development were prepared to depict the appearance of the project from the selected viewpoints. Third, based on the simulations, the level of impact to the visual environment was determined in relation to the CEQA significance criteria.

Thresholds of Significance

As part of the Initial Study (see Appendix A of this EIR), it was determined that the proposed project would not substantially damage scenic resources within a state scenic highway; create a new source of substantial light or glare that would adversely affect day or nighttime views in the area; or create a new source of substantial shade and shadow that would adversely affect daytime views in the area. Accordingly, these issues are not further analyzed in the EIR.

Pursuant to the CEQA Guidelines, the proposed project would have a significant effect on aesthetic resources if it would:

- Have a substantial adverse effect on a scenic vista; or
- Substantially degrade the existing visual character or quality of the site and its surroundings.

Impact Analysis

VIS-1 *The proposed project would not have a substantial adverse effect on a scenic vista.*

Scenic vistas generally refer to views of expansive open space areas or other natural features, such as mountains, undeveloped hillsides, large natural water bodies, or coastlines. Under CEQA, scenic vistas also generally refer to views that are accessible to the public. The northern portion of the SCRC, located just north of Upper Stone Reservoir itself, is included within the Outer Corridor zone of the Mulholland Scenic Parkway Specific Plan Area, which has been designated to help preserve natural scenic values and enhance recreation opportunities along the Mulholland Drive corridor. Due to the intervening terrain and vegetation, a low stone wall along the property boundary, and the change in elevation from the roadway to the surface of Upper Stone Reservoir, the reservoir is not visible to motorists on Mulholland Drive. As discussed above, the only publicly-accessible viewpoint is provided at the Nicada Overlook located 0.75 miles east of the SCRC gate on Mulholland Drive. From the overlook, Upper Stone Reservoir is visible in the middle ground of the view. A small portion of Lower Stone Reservoir is also visible beyond Upper Stone Reservoir. In this view, Upper Stone Reservoir is clearly a manmade structure, with straight, hard-surface edges (see Figure 3.1-11).

Implementation of the proposed project would alter the view from Key Viewpoint 1 by replacing the open water surface of Upper Stone Reservoir with a flat vegetated area (see Figure 3.1-12). The side walls of the existing upper reservoir would be demolished, although the perimeter road would be retained and be partially visible. Due to limitations on the size and type of vegetation that could be planted and/or survive atop the buried reservoir, only low-growing, shallow-rooting scrub vegetation and native grasses would be utilized. Because of the limited height profile of these plants and because of the generally flat terrain of the Upper Stone Reservoir site (as opposed to the steeper slopes of the surrounding canyon), the proposed project would not entirely visually replicate the natural habitat of Stone Canyon. However, based on the distance from Upper Stone Reservoir of an observer at the Nicada Overlook, this incongruity would be less apparent. The public view from the overlook on Mulholland Drive following completion of the proposed project would generally provide a view that is compatible with the scenic vista of the canyon. Although the water surface of Upper Stone Reservoir would be removed, the open water of a portion of Lower Stone Reservoir would still be part of the view.

Because implementation of the proposed project would help restore the natural appearance of the canyon by concealing Upper Stone Reservoir and replacing it with vegetation, the proposed project would be consistent with the surrounding setting in Stone Canyon and would therefore not create a significant impact to a scenic vista from the Nicada Overlook.

VIS-2 *The proposed project would not substantially degrade the existing visual character or quality of the site and its surroundings.*

The proposed project would alter the visual character of the Upper Stone Reservoir site by removing the existing uncovered reservoir and replacing it with low-growing scrub vegetation and native grasses similar to existing vegetation located within the SCRC. The side walls, outlet tower and footbridge, and perimeter fence of the existing reservoir would be demolished, although the perimeter road would be retained.

As discussed above, publicly available views of Upper Stone Reservoir are limited to the Nicada Overlook located on Mulholland Drive east of the SCRC gate (see Figure 3.1-11). The overlook provides middle ground views of portions of Upper Stone Reservoir, as well as a small portion of Lower Stone Reservoir in the background. It also provides expansive views of the canyon and the surrounding residential communities. In this view, the manmade nature of Upper Stone Reservoir is apparent because the perimeter road, side walls, and outlet structure and footbridge contrast with the otherwise natural setting the canyon.

Upper Stone Reservoir can also be seen from some residential areas that surround the SCRC property on the adjacent ridgelines. Due to their location, many private views are often closer to Upper Stone Reservoir than the public view from the Nicada Overlook. As shown in Figure 3.1-13, properties located on the west side of the SCRC property with views of Upper Stone Reservoir also see the chlorination station located directly west of the upper reservoir. The sidewalls and perimeter road of the upper reservoir are apparent in this view. The open water surface is a component of the view. However, Upper Stone Reservoir looks clearly manmade.

Figure 3.1-11 Existing view from Mulholland Drive public overlook

Figure 3.1-12 Proposed view from Mulholland Drive public overlook

Figure 3.1-13 Existing private view from south-southwest of Upper Stone Reservoir

Figure 3.1-14 Proposed private view from south-southwest of Upper Stone Reservoir

The proposed project would establish a predominantly open space area in the place of Upper Stone Reservoir (i.e., a primarily vegetated surface on the top of the buried reservoir). Views of the proposed project from both viewpoints (i.e., from the public overlook and private properties adjacent to the SCRC) would be modified because Upper Stone Reservoir would be concealed and replaced with vegetation. From both Key Viewpoint 1 and Key Viewpoint 2, the view would be generally consistent with the surrounding undeveloped hillsides within Stone Canyon. As such, the proposed project would be visually compatible with the overall setting of canyon (see Figures 3.1-11 through 3.1-14), and it would not substantially degrade the existing visual character or quality of the site and its surroundings. The impact to aesthetics would be less than significant.

3.1.3 Mitigation Measures

No mitigation measures are required.

3.1.4 Significance After Mitigation

The impact would be less than significant without the implementation of mitigation.

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CHAPTER 3.2
AIR QUALITY/GREENHOUSE GAS EMISSIONS

This chapter examines the degree to which the proposed project may result in significant adverse changes to air quality, including greenhouse gas emissions. Both short-term emissions occurring from construction activities, such as site grading and haul truck trips, and long-term effects related to the ongoing operation of the proposed project are discussed in this chapter. This analysis focuses on air pollution from two perspectives: daily emissions and pollutant concentrations. “Emissions” refer to the quantity of pollutant released into the air, measured in pounds per day. “Concentrations” refer to the amount of pollutant material per volumetric unit of air, measured in parts per million (ppm) or micrograms per cubic meter ($\mu g/m^3$). The air quality technical report is included as part of Appendix D of this EIR.

3.2.1 Pollutants and Effects

Criteria air pollutants are defined as pollutants for which the federal and state governments have established ambient air quality standards for outdoor concentrations to protect public health. The federal and state standards have been set at levels above which concentrations could be harmful to human health and welfare. These standards are designed to protect the most sensitive persons from illness or discomfort. Pollutants of concern include carbon monoxide (CO), ozone (O_3), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter 2.5 microns or less in diameter ($PM_{2.5}$), particulate matter 10 microns or less in diameter (PM_{10}), and lead (Pb). These pollutants are described below and in more detail in Appendix D.

Carbon Monoxide. CO is a colorless and odorless gas formed by the incomplete combustion of fossil fuels. CO is emitted almost exclusively from motor vehicles, power plants, refineries, industrial boilers, ships, aircraft, and trains. In urban areas such as the project location, vehicle exhaust accounts for the majority of CO emissions. In terms of health, CO competes with oxygen, often replacing it in the blood, thus reducing the blood’s ability to transport oxygen to vital organs. The results of excess CO exposure can be dizziness, fatigue, and impairment of central nervous system functions.

Ozone. O_3 is a colorless gas that is formed in the atmosphere when reactive organic gases (ROG), which include volatile organic compounds (VOCs), and nitrogen oxides (NO_X) react in the presence of sunlight. O_3 is not a primary pollutant; it is a secondary pollutant formed by complex interactions of two pollutants directly emitted into the atmosphere. The primary sources of ROG and NO_X, the components of O_3, are vehicle exhaust and industrial sources. Short-term exposure (lasting for a few hours) to O_3 at levels typically observed in Southern California can result in breathing pattern changes, reduction of breathing capacity, increased susceptibility to infections, inflammation of the lung tissue, and some immunological changes.

Nitrogen Dioxide. NO_2, like O_3, is not directly emitted into the atmosphere but is formed by an atmospheric chemical reaction between nitric oxide (NO) and atmospheric oxygen. NO and NO_2 are collectively referred to as NO_X and are major contributors to O_3 formation. NO_2 also contributes to the formation of PM_{10}. It results in a brownish-red cast to the atmosphere with reduced visibility. High concentrations of NO_2 can cause breathing difficulties. There is some indication of a relationship between NO_2 and chronic pulmonary fibrosis. Some increase of bronchitis in children (two and three year olds) has also been observed at concentrations below 0.3 ppm.

Sulfur Dioxide. SO_2 is a colorless, pungent gas formed primarily by the combustion of sulfur-containing fossil fuels. The main sources of SO_2 are coal and oil used in power plants and industries. Generally, the highest levels of SO_2 are found near large industrial complexes. In recent years, SO_2 concentrations have been reduced by the increasingly stringent controls placed on stationary source emissions of SO_2 and limits on the sulfur content of fuels. SO_2 is an irritant gas that attacks the throat and lungs. It can cause acute respiratory symptoms and diminished lung function in children.

Particulate Matter. Particulate matter pollution consists of very small liquid and solid particles floating in the air, which can include smoke, soot, dust, salts, acids, and metals. Particulate matter also forms when gases emitted from industries and motor vehicles undergo chemical reactions in the atmosphere. Fine particulate matter, or $PM_{2.5}$, is 2.5 micrometers or less in diameter, roughly $1/28^{th}$ the diameter of a human hair. $PM_{2.5}$ results from fuel combustion (e.g. motor vehicles, power generation, and industrial facilities), residential fireplaces, and wood stoves. In addition, $PM_{2.5}$ can be formed in the atmosphere from gases such as SO_2, NO_X, and VOCs. Inhalable particulate matter, or PM_{10}, is 10 micrometers or less in diameter, about $1/7^{th}$ the thickness of a human hair. The major sources of PM_{10} include crushing or grinding operations; dust stirred up by vehicles traveling on roads; wood burning stoves and fireplaces; dust from construction, landfills, and agriculture; wildfires and brush/waste burning; industrial sources; windblown dust from open lands; and atmospheric chemical and photochemical reactions. $PM_{2.5}$ and PM_{10} pose a greater health risk than larger-size particles. When inhaled, these tiny particles can penetrate the human respiratory system's natural defenses and damage the respiratory tract. $PM_{2.5}$ and PM_{10} can increase the number and severity of asthma attacks, cause or aggravate bronchitis and other lung diseases, and reduce the body's ability to fight infections.

Lead. Pb in the atmosphere occurs as particulate matter. Sources of lead include the manufacture of batteries, paint, ink, ceramics, and ammunition as well as secondary lead smelters. Health effects associated with exposure to lead include gastrointestinal disturbances, anemia, kidney disease, and in severe cases, neuromuscular and neurological dysfunction.

Toxic Air Contaminants. A substance is considered toxic if it has the potential to cause adverse health effects in humans. A toxic substance released into the air is considered a toxic air contaminant (TAC). TACs are identified by state and federal agencies based on a review of available scientific evidence.

Greenhouse Gases. Greenhouse gas (GHG) emissions refer to a group of emissions that are generally believed to affect global climate conditions. The greenhouse effect compares the Earth and the atmosphere surrounding it to a greenhouse with glass panes. The glass panes in a greenhouse let heat from sunlight in and reduce the amount of heat that escapes. GHGs, such as carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O), keep the average surface temperature of the Earth close to 60 degrees Fahrenheit (°F). In addition to CO_2, CH_4, and N_2O, GHGs include hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride, and water vapor. Of all the GHGs, CO_2 is the most abundant gas that contributes to climate change through fossil fuel combustion. CO_2 comprised 83.3 percent of the total GHG emissions in California in 2002 (California EPA 2006). The other GHGs are less abundant but have higher global warming potential than CO_2. To account for this higher potential, emissions of other GHGs are frequently expressed in the equivalent mass of CO_2, denoted as CO_2e. In addition, there are a number of human-made pollutants, such as CO, NO_X, non-methane VOCs, and SO_2, that have indirect effects on terrestrial or solar radiation absorption by influencing the formation or destruction of other GHG emissions.

3.2.2 Existing Environmental Setting

Air Pollution Climatology

The project site is located within the Los Angeles County portion of the South Coast Air Basin. The South Coast Air Basin is a coastal plain with connecting broad valleys and low hills, bounded by the Pacific Ocean to the west and high mountains around the rest of its perimeter. Ambient pollution concentrations recorded in Los Angeles County are among the highest in the four counties comprising the South Coast Air Basin.

The South Coast Air Basin is in an area of high air pollution potential due to its climate and topography. The general region lies in the semi-permanent high pressure zone of the eastern Pacific, resulting in a mild climate tempered by cool sea breezes with light average wind speeds. The South Coast Air Basin experiences warm summers, mild winters, infrequent rainfalls, light winds, and moderate humidity. This usually mild climatological pattern is interrupted infrequently by periods of extremely hot weather, winter storms, or Santa Ana winds.

The South Coast Air Basin experiences frequent temperature inversions. Air temperature typically decreases with height. However, under inversion conditions, temperature increases as altitude increases, thereby preventing air close to the ground from mixing with the air above it. As a result, air pollutants are trapped near the ground. During the summer, air quality problems are partially due to the interaction between the ocean surface and the lower layer of the atmosphere. This interaction creates a moist marine layer. An upper layer of warm air mass forms over the cool marine layer, preventing air pollutants from dispersing upward. Additionally, hydrocarbons and NO_2 react under strong sunlight, creating photochemical smog. Light, daytime winds, predominantly from the west, further aggravate the condition by driving air pollutants inland toward the mountains. During the fall and winter, air quality problems are due to CO and NO_2 emissions. CO concentrations are generally worse in the morning and late evening. In the morning, CO levels are relatively high due to cold temperatures and the large number of vehicles traveling. High CO levels during the late evenings (around 10:00 p.m.) are a result of stagnant atmospheric conditions trapping CO in the area. Since CO emissions are produced almost entirely from vehicles, the highest CO concentrations in the South Coast Air Basin are associated with heavy traffic. NO_2 concentrations are also generally higher during fall and winter days.

Local Climate

The mountains and hills within the South Coast Air Basin contribute to the variation of rainfall, temperature, and winds throughout the region. Within the proposed project site and its vicinity, the average wind speed, as recorded at the Downtown Los Angeles Wind Monitoring Station, is approximately 2 miles per hour (mph). Wind in the vicinity of the site predominately blows from the southwest.

The annual average temperature in the proposed project area is 76 °F (Western Regional Climate Center 2010). The proposed project site experiences an average winter temperature of approximately 67°F and an average summer temperature of approximately 85°F. Total precipitation in the vicinity of the site averages approximately 16 inches annually. Precipitation occurs mostly during the winter and relatively infrequently during the summer. Precipitation averages approximately 10 inches during the winter, approximately 4 inches during the spring, approximately 2 inches during the fall, and less than 1 inch during the summer (Western Regional Climate Center 2010).

Air Monitoring Data

The South Coast Air Quality Management District (SCAQMD) monitors air quality conditions at 37 locations throughout the South Coast Air Basin. The proposed project site is located in SCAQMD's Coastal Air Monitoring Subregion, which is recorded at the Los Angeles VA Hospital Monitoring Station, located approximately 5 miles southwest of the proposed project site in West Los Angeles. Historical data from the Los Angeles VA Hospital Monitoring Station were used to characterize existing conditions in the vicinity of the project site. Criteria pollutants monitored at the Los Angeles VA Hospital Monitoring Station include O_3, CO, NO_2. However, SO_2, $PM_{2.5}$, and PM_{10} were not monitored at this station during the time of the preparation of this EIR. The next most representative monitoring stations located in the project vicinity that measure the remaining criteria pollutants include the Reseda Monitoring Station, which is located 7 miles northwest of the project area, and the Burbank Monitoring Station, which is located 9 miles from the project site. Historical data from these stations was used to characterize existing SO_2, $PM_{2.5}$, and PM_{10} levels. Table 3.2-1 shows pollutant levels, the state and federal standards, and the number of exceedances recorded at Los Angeles VA Hospital, Reseda, and Burbank Monitoring Stations compared to the highest figures derived from the Coastal General Forecast Area from 2007 to 2009.

Table 3.2-1 2007-2009 Ambient Air Quality In Project Vicinity

Pollutant	Pollutant Concentration & Standards	Number of Days Above State Standard					
		Los Angeles VA, Reseda, and Burbank Monitoring Stations[1]			Coastal General Forecast Area[1,2]		
		2007	2008	2009[3]	2007	2008	2009[4]
Ozone	Maximum 1-hr Concentration (ppm) Days > 0.09 ppm (state 1-hr standard) Days > 0.12 ppm (federal 1-hr standard)	0.12 2 0	0.11 3 0	0.13 6 1	0.10 2 0	0.10 3 0	-
Carbon Monoxide	Maximum 1-hr concentration (ppm) Days > 20 ppm (state1-hr standard) Maximum 8-hr concentration (ppm) Days > 9.0 ppm (state 8-hr standard)	3 0 2 0	3 0 2 0	n/a n/a 2 0	3.5 0 2.5 0	3.3 0 2.3 0	- -
Nitrogen Dioxide	Maximum 1-hr Concentration (ppm) Days > 0.18 ppm (state 1-hr standard)	0.08 0	0.09 0	0.08 0	0.09 0	0.10 0	-
PM_{10}	Maximum 24-hr concentration ($\mu g/m^3$) Days > 50 $\mu g/m^3$ (state 24-hr standard)	109 11	66 7	76 10	86 5	56 1	-
$PM_{2.5}$	Annual Arithmetic Mean ($\mu g/m^3$) Exceed State Standard (12 $\mu g/m^3$)	17 Yes	14 Yes	15 Yes	15 Yes	14 Yes	-
Sulfur Dioxide	Maximum 24-hr Concentration (ppm) Days > 0.04 ppm (state 24-hr standard)	0.01 0	0.01 0	<0.01 0	0.5 0	0.04 0	-

[1] The Coastal General Forecast Area includes the Northwest Los Angeles County, Southwest Los Angeles County, South Los Angeles County, North Orange County, and Central Orange County air monitoring areas of the SCAQMD.
[2] An average of the maximum concentration of each criteria pollutant of the air monitoring areas of the Coastal General Forecast Area was used to represent maximum concentrations in the Coastal General Forecast Area.
[3] 2009 data provided by CARB Air Quality Data Statistics. West Los Angeles VA Hospital air monitoring station data was used for each pollutant, except SO_2, $PM_{2.5}$, and PM_{10}, which used the Reseda and Burbank air monitoring station. Available at http://www.arb.ca.gov/adam/index.html, accessed July 20, 2010.
[4] Data not available when this report was completed.
Source: SCAQMD 2010.

Greenhouse Gases

Table 3.2-2 shows 2002 to 2004 average emissions and estimates for projected emissions in 2020 without any GHG reduction measures (business-as-usual case). The 2020 business-as-usual forecast does not take any credit for reductions from measures included in the California Assembly Bill 32 Scoping Plan, including the Pavley GHG emissions standards for vehicles, full implementation of the Renewables Portfolio Standard beyond current levels of renewable energy, or solar measures. The Transportation sector – largely the cars and trucks that move goods and people – is the largest contributor with 38 percent of the state's total GHG emissions.

Table 3.2-2 Average Emissions and 2020 Projected Emissions (Business-As-Usual)

Sector	2002 to 2004 Average Emissions	Projected 2020 Emissions
	Million Metric Tons of CO_2e	
Transportation	179.3	225.4
Electricity	109.0	139.2
Commercial and Residential Energy	41.0	46.7
Industry	95.9	100.5
Recycling and Waste	5.6	7.7
High Global Warming Potential	14.8	46.9
Agriculture	27.7	29.8
Forest Net Emissions	(4.7)	0.0
Emissions Total	*469*	*596*

Source: CARB 2008.

In December 2007, the California Air Resources Board (CARB) approved a GHG emissions target for 2020 equivalent to the state's calculated GHG emissions level in 1990. CARB developed the 2020 target after extensive technical work and a series of stakeholder meetings. The 2020 target of 427 million metric tons of CO_2e requires a reduction of 169 million metric tons of CO_2e, or approximately 30 percent, from the state's projected 2020 emissions of 596 million metric tons of CO_2e (business-as-usual) and a reduction of 42 million metric tons of CO_2e, or almost 10 percent, from 2002 to 2004 average emissions.

Sensitive Receptors

Some land uses are considered more sensitive to changes in air quality than others, depending on the population groups and the activities involved. CARB has identified the following groups who are most likely to be affected by air pollution: children under 14 years of age, the elderly over 65 years of age, athletes, and people with cardiovascular and chronic respiratory diseases. According to the SCAQMD, sensitive receptors include residences, schools, playgrounds, child care centers, athletic facilities, long-term health care facilities, rehabilitation centers, convalescent centers, and retirement homes. As shown in Figure 3.2-1, sensitive receptors near the project site include the following:

Upper Stone Reservoir

- Single-family residences located on Antelo Place and Roscomare Road, set back approximately 650 feet from the SCRC construction access road
- Single-family residences surrounding Upper Stone Reservoir
- Roscomare Road Elementary School, approximately 2,150 feet west of Upper Stone Reservoir

SOURCE: Terry A. Hayes Associates2011

LEGEND:

Upper Stone Canyon Reservoir

Sensitive Receptor Locations

1. Single-Family Residence on Antelo Place
2. Single-Family Residences on Roscomare Road at Belcanto
3. Single-Family Residences on Mulholland Drive at Antelo
4. Single-Family Residences on Roscomare Road
5. Single-Family Residences on Bottlebrush Drive
6. Roscomare Road Elementary School
7. American Jewish University
8. Stephen S. Wise Elementary School

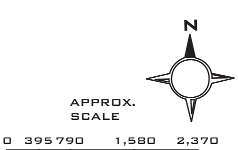


Figure 3.2-1

Air Quality Sensitive Receptor Locations

Haul Route

- Single-family residences along Mulholland Drive west of the SCRC
- American Jewish University along Mulholland Drive
- Stephen S. Wise Elementary School along Mulholland Drive

The above sensitive receptors represent the nearest residential and school land uses potentially impacted by the proposed project. Additional single-family residences are located in the surrounding community within 0.5 mile of the proposed project construction haul routes (both on and off site) and the reservoir construction site.

3.2.3 Regulatory Setting

Federal Clean Air Act

The Federal Clean Air Act governs air quality in the U.S. The EPA is responsible for enforcing the Clean Air Act. The EPA is also responsible for establishing the National Ambient Air Quality Standards, which are required under the 1977 Clean Air Act and subsequent amendments. The EPA regulates emission sources that are under the exclusive authority of the federal government, such as aircraft, ships, and certain types of locomotives. The EPA has jurisdiction over emission sources outside state waters (e.g., beyond the outer continental shelf) and establishes various emission standards, including those for vehicles sold in states other than California. Automobiles sold in California must meet stricter emission standards established by CARB.

As required by the Clean Air Act, National Ambient Air Quality Standards have been established for seven major air pollutants: CO, NO_2, O_3, $PM_{2.5}$, PM_{10}, SO_2, and Pb. The Clean Air Act requires the EPA to designate areas as attainment, nonattainment, or maintenance (previously nonattainment and currently attainment) for each criteria pollutant based on whether the National Ambient Air Quality Standards have been achieved. The federal standards are summarized in Table 3.2-3. The EPA has classified the South Coast Air Basin nonattainment for O_3, $PM_{2.5}$, and PM_{10}.

California Clean Air Act

In addition to being subject to the requirements of the Federal Clean Air Act, air quality in California is also governed by more stringent regulations under the California Clean Air Act. The California Clean Air Act is administered by CARB at the state level and by the air quality management districts and air pollution control districts at the regional and local levels. The California Clean Air Act, as amended in 1992, requires all air districts in the state to endeavor to achieve and maintain the California Ambient Air Quality Standards, which are generally more stringent than the corresponding federal standards and incorporate additional standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles. CARB regulates mobile air pollution sources, such as motor vehicles. CARB is also responsible for setting emission standards for vehicles sold in California and for other emission sources, such as consumer products and certain off-road equipment. CARB established passenger vehicle fuel specifications, which became effective in March 1996. The state ambient air quality standards are also summarized in Table 3.2-3.

Table 3.2-3 State and National Ambient Air Quality Standards and Attainment Status for the South Coast Air Basin

Pollutant	Averaging Period	California		Federal	
		Standards	Attainment Status	Standards	Attainment Status
Ozone (O_3)	1-hour	0.09 ppm (180 μg/m^3)	Nonattainment	--	--
	8-hour	0.070 ppm (137 μg/m^3)	n/a[1]	0.075 ppm (147 μg/m^3)	Nonattainment
Respirable Particulate Matter (PM_{10})	24-hour	50 μg/m^3	Nonattainment	150 μg/m^3	Nonattainment
	Annual Arithmetic Mean	20 μg/m^3	Nonattainment	--	--
Fine Particulate Matter ($PM_{2.5}$)	24-hour	--	--	35 μg/m^3	Nonattainment
	Annual Arithmetic Mean	12 μg/m^3	Nonattainment	15.0 μg/m^3	Nonattainment
Carbon Monoxide (CO)	8-hour	9.0 ppm (10 mg/m^3)	Attainment	9 ppm (10 mg/m^3)	Unclassified[2]
	1-hour	20 ppm (23 mg/m^3)	Attainment	35 ppm (40 mg/m^3)	Unclassified[2]
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	0.030 ppm (57 μg/m^3)	Nonattainment	53 ppb (100 μg/m^3)	Unclassified[2]
	1-hour	0.18 ppm (338 μg/m^3)	Nonattainment	100 ppb (190 μg/m^3)	n/a[1]
Sulfur Dioxide (SO_2)	24-hour	0.04 ppm (105 μg/m^3)	Attainment	--	--
	3-hour	--	--	--	--
	1-hour	0.25 ppm (655 μg/m^3)	Attainment	75 ppb (196 μg/m$^{3)}$	Attainment
Lead (Pb)	30-day average	1.5 μg/m^3	Nonattainment	--	--
	Calendar Quarter	--	--	0.15 μg/m^3	Attainment

[1] n/a = not available means that the attainment status has not been determined for these pollutants. This is not an official designation.
[2] Unclassified means the data are incomplete and do not support a designation of attainment or nonattainment. Unclassified is an official designation.
Source: CARB 2010.

The California Clean Air Act requires CARB to designate areas within California as either attainment or nonattainment for each criteria pollutant based on whether the California Ambient Air Quality Standards have been achieved. Under the California Clean Air Act, areas are designated as nonattainment for a pollutant if air quality data show that a state standard for the pollutant was violated at least once during the previous three calendar years. Exceedances that are affected by highly irregular or infrequent events are not considered violations of a state standard and are not used as a basis for designating areas as nonattainment. Under the California Clean Air Act, the Los Angeles County portion of the South Coast Air Basin is designated as a nonattainment area for O_3, $PM_{2.5}$, and PM_{10}, NO_2, and Pb (CARB 2010).

1977 Lewis Air Quality Management Act

The 1977 Lewis Air Quality Management Act created the SCAQMD to coordinate air quality planning efforts throughout Southern California. This act merged four county air pollution control agencies into one regional district to better address the issue of improving air quality in Southern California. Under the act, renamed the Lewis-Presley Air Quality Management Act in 1988, the SCAQMD is the agency principally responsible for comprehensive air pollution control in the region. Specifically, the SCAQMD is responsible for monitoring air quality, as well as planning, implementing, and enforcing programs designed to attain and maintain state and federal ambient air quality standards in the district. Programs that were developed include air quality rules and regulations relating to stationary sources, area sources, point sources, and certain mobile source emissions. The SCAQMD is also responsible for establishing stationary source permitting requirements and for ensuring that new, modified, or relocated stationary sources do not create net emission increases.

The South Coast Air Basin is a subregion of the SCAQMD and covers an area of 6,745 square miles. The South Coast Air Basin includes all of Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino counties. The South Coast Air Basin is bounded by the Pacific Ocean to the west; the San Gabriel, San Bernardino and San Jacinto Mountains to the north and east; and the San Diego County line to the south.

Air Quality Management Plan

All areas designated as nonattainment under the California Clean Air Act are required to prepare plans showing how the area will meet the state air quality standards by its attainment dates. The Air Quality Management Plan (AQMP) is the SCAQMD plan for improving regional air quality. It addresses Clean Air Act and California Clean Air Act requirements and demonstrates attainment with state and federal ambient air quality standards. The AQMP is prepared by SCAQMD and the Southern California Association of Governments (SCAG). The current AQMP was adopted by the SCAQMD on June 1, 2007. The AQMP provides policies and control measures that reduce emissions to attain both state and federal ambient air quality standards by their applicable deadlines. Environmental review of individual projects within the South Coast Air Basin must demonstrate that daily construction and operational emissions thresholds, as established by the SCAQMD, would not be exceeded. The environmental review must also demonstrate that individual projects would not increase the number or severity of existing air quality violations.

Greenhouse Gas Emissions

Assembly Bill 1493 and Executive Order S-3-05

California has recently adopted a series of laws to reduce emissions of GHGs into the atmosphere. In September 2002, Assembly Bill 1493 was enacted, requiring the development and adoption of regulations to achieve "the maximum feasible reduction of greenhouse gases" emitted by noncommercial passenger vehicles, light-duty trucks, and other vehicles used primarily for personal transportation in the state. California Governor Arnold Schwarzenegger announced, on June 1, 2005, through Executive Order S-3-05, the following GHG emission reduction targets: by 2010, reduce GHG emissions to 2000 levels; by 2020, reduce GHG emissions to 1990 levels; and by 2050, reduce GHG emissions to 80 percent below 1990 levels.

Global Warming Solutions Act of 2006

In September 2006, Governor Arnold Schwarzenegger signed the California Global Warming Solutions Act of 2006, also known as Assembly Bill 32, into law. Assembly Bill 32 focuses on reducing GHG emissions in California, and requires CARB to adopt rules and regulations that would achieve by 2020 GHG emissions equivalent to statewide levels in 1990. To achieve this goal, Assembly Bill 32 mandates that CARB establish a quantified emissions cap, institute a schedule to meet the cap, implement regulations to reduce statewide GHG emissions, and develop tracking, reporting, and enforcement mechanisms to ensure that reductions are achieved. Because the intent of Assembly Bill 32 is to limit 2020 emissions to the equivalent of 1990, it is expected that the regulations would affect many existing sources of GHG emissions and not just new general development projects.

Assembly Bill 32 charges CARB with the responsibility to monitor and regulate sources of GHG emissions in order to reduce those emissions. CARB has determined that the total statewide aggregated 1990 GHG emissions level and 2020 emissions limit is 427 million metric tons of CO_2e. The 2020 target reductions are currently estimated to be 174 million metric tons of CO_2e. The CARB Assembly Bill 32 Scoping Plan contains the main strategies to achieve the 2020 emissions cap. The GHG reduction strategies contained in the Scoping Plan include direct regulations, alternative compliance mechanisms, monetary and non-monetary incentives, voluntary actions, and market-based mechanisms such as a cap-and-trade system. The measures in the Scoping Plan adopted by CARB will be developed and put in place by 2012.

Senate Bill 97

California Senate Bill 97 required the Governor's Office of Planning and Research to develop CEQA guidelines "for the mitigation of greenhouse gas emissions or the effects of greenhouse gas emissions." The CEQA Guidelines amendments provide guidance to public agencies regarding the analysis and mitigation of the effects of GHG emissions in CEQA documents.

Senate Bill 375

California Senate Bill 375, passed September 30, 2008, provides a means for achieving Assembly Bill 32 goals through the regulation of cars and light trucks. Senate Bill 375 also aligns three critical policy areas of importance to local government: (1) regional long-range transportation plans and investments; (2) regional allocation of the obligation for cities and counties to zone for housing; and (3) a process to achieve GHG emission reduction targets for the transportation sector. Senate Bill 375 establishes a process for CARB to develop GHG emissions reductions targets for each region (as opposed to individual local governments or households). CARB must take certain factors into account before setting the targets, such as considering the likely reductions that will result from actions to improve the fuel efficiency of the statewide fleet and regulations related to the carbon content of fuels (low carbon fuels).

CARB GHG Guidance

CARB has published draft guidance for setting interim GHG significance thresholds (October 24, 2008). The guidance is the first step toward developing the recommended statewide interim thresholds of significance for GHG emissions that may be adopted by local agencies for their own use. The guidance does not attempt to address every type of project that may be subject to CEQA, but instead focuses on common project types that are responsible for substantial GHG emissions (i.e., industrial, residential, and commercial projects). CARB believes that thresholds in these important sectors will advance climate objectives, streamline project review, and encourage consistency and uniformity in the CEQA analysis of GHG emissions throughout the state.

SCAQMD GHG Guidance

The SCAQMD has convened a GHG CEQA Significance Threshold Working Group to provide guidance to local lead agencies on determining significance for GHG emissions in their CEQA documents. Members of the working group include government agencies implementing CEQA and representatives from various stakeholder groups that will provide input to the SCAQMD staff on developing GHG CEQA significance thresholds. On December 5, 2008, the SCAQMD Governing Board adopted the staff proposal for an interim GHG significance threshold for industrial projects where the SCAQMD is lead agency. The SCAQMD has not adopted guidance for CEQA projects under other lead agencies.

3.2.4 Environmental Impacts

Methodology

Construction

This air quality analysis is consistent with the methods described in the SCAQMD *CEQA Air Quality Handbook* (1993 edition), as well as the updates to the *CEQA Air Quality Handbook*, as provided on the SCAQMD website (SCAQMD 2010).

The localized construction analysis followed guidelines published by the SCAQMD in the *Localized Significance Methodology for CEQA Evaluations (SCAQMD Localized Significance Threshold [LST] Guidance Document)* (SCAQMD 2008).

Health Risk Assessment

A health risk assessment was completed using emissions factors from EMFAC2007 and OFFROAD2007 emissions inventory models for haul truck and on-site heavy equipment emissions, respectively. AERMOD dispersion modeling software was used to determine the concentrations of diesel particulate matter generated from haul truck trips and heavy equipment used in and around the project site.

The Health Risk Assessment was prepared based on emissions from haul trucks and diesel-powered construction equipment. The first step was to calculate the mass emissions from these sources. Construction activity would generate about 70,200 one-way truck trips, either inbound to or outbound from the SCRC. On-road truck emissions were calculated based on the haul route from the project site to I-405 and emission rates from the EMFAC2007 model. It was assumed that each truck would idle on the project site for 15 minutes, and the idle emission rate was also obtained from the EMFAC2007 model. Equipment emissions were obtained from the OFFROAD model.

The truck and equipment emission rates were input into the AERMOD dispersion model to obtain annual exposure concentrations. The model is a steady state Gaussian plume model for estimating ground level impacts from point, area, and volume sources in simple and complex terrain. The model offers additional flexibility by allowing the user to assign initial vertical and lateral dispersion parameters for stationary sources. Truck emissions were modeled based on

SCAQMD *Health Risk Assessment Guidance for Analyzing Cancer Risks from Mobile Source Diesel Idling Emissions for CEQA Air Quality Analysis* (August 2003). Idle emissions were treated as an area source with a 5-meter release height. On-road emissions along the haul route were input as a line source with a release height of 5 meters.

Operations

URBEMIS2007 Version 9.2.4 emission modeling software was used to calculate operational mobile source emissions. URBEMIS incorporates EMFAC2007 emissions rates, which are the latest emission inventory for motor vehicles operating on roads in California. This reflects CARB's current understanding of how vehicles travel and how much they pollute. The URBEMIS model can be used to show how California motor vehicle emissions have changed over time and are projected to change in the future.

Greenhouse Gas Emissions

For the purpose of this analysis, GHG emissions were quantified from construction and from mobile sources related to operations of the proposed project. GHG emissions were estimated using the same methodology presented above for construction and operational emissions.

Thresholds of Significance

As part of the Initial Study (see Appendix A), it was determined that the proposed project would not conflict with or obstruct implementation of the applicable AQMP or create objectionable odors. Accordingly, these issues are not further analyzed in the EIR.

Pursuant to the CEQA Guidelines, the proposed project would have a significant effect on air quality if it would:

- Violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors);
- Expose sensitive receptors to substantial pollutant concentrations;
- Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment; or
- Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

The following are the significance criteria SCAQMD has established to determine project impacts.

Construction Phase Significance Criteria

The proposed project would have a significant impact if:

- Daily regional construction emissions were to exceed SCAQMD construction emissions thresholds for VOCs, NO_X, CO, SO_X, $PM_{2.5}$, or PM_{10}, as presented in Table 3.2-4;
- Localized concentrations of CO exceed the 1-hour standard of 20 ppm or the 8-hour standard of 9.0 ppm;
- Localized concentrations of NO_2 exceed the 1-hour standard of 0.18 ppm;
- Localized concentrations of $PM_{2.5}$ or PM_{10} exceed 10.4 μg/m_3;
- The proposed project would generate TAC emissions that generate a health risk that exceeds 10 persons in 1 million.

Table 3.2-4 SCAQMD Daily Construction Emissions Thresholds

Criteria Pollutant	Regional Emissions (Pounds Per Day)
Volatile Organic Compounds (VOCs)	75
Nitrogen Oxides (NO_X)	100
Carbon Monoxide (CO)	550
Sulfur Oxides (SO_X)	150
Fine Particulates ($PM_{2.5}$)	55
Particulates (PM_{10})	150

Source: SCAQMD 2010.

Operations Phase Significance Criteria

The proposed project would have a significant impact if:

- Daily operational emissions were to exceed SCAQMD operational emissions thresholds for VOCs, NO_X, CO, SO_X, $PM_{2.5}$, or PM_{10}, as presented in Table 3.2-5;
- Project-related traffic causes CO concentrations at study intersections to violate the California Ambient Air Quality Standards for either the 1- or 8-hour period (20 ppm and 9.0 ppm, respectively);
- The proposed project would generate significant emissions of TACs.

Table 3.2-5 SCAQMD Daily Operational Emissions Thresholds

Criteria Pollutant	Regional Emissions (Pounds Per Day)
Volatile Organic Compounds (VOCs)	55
Nitrogen Oxides (NO_X)	55
Carbon Monoxide (CO)	550
Sulfur Oxides (SO_X)	150
Fine Particulates ($PM_{2.5}$)	55
Particulates (PM_{10})	150

Source: SCAQMD 2010.

Greenhouse Gas Significance Criteria

A proposed project must demonstrate if GHG emissions would have a significant impact on the environment and if it would conflict with an applicable plan, policy or regulation adopted for the purpose of reducing GHG emissions. The SCAQMD has adopted a GHG significance threshold for stationary industrial projects of 10,000 metric tons CO_2e per year consisting of construction emissions amortized over 30 years combined with annual operational emissions. In addition, a significant impact would result if GHG emissions conflict with any applicable climate change policy or regulation previously discussed.

Impact Analysis

AIR-1 *During the construction phase, the proposed project would violate the air quality standards for NO_x, $PM_{2.5}$, and PM_{10} and contribute substantially to an existing or projected air quality violation. In addition, the proposed project would result in a cumulatively considerable net increase in NO_x, $PM_{2.5}$, and PM_{10} during construction.*

Construction Phase

Construction of the proposed project has the potential to create air quality impacts through the use of heavy-duty construction equipment, including off-site truck trips, and through vehicle trips generated by construction workers traveling to and from the project site. Fugitive dust emissions would primarily result from demolition and site preparation (e.g., excavation) activities. NO_X emissions would primarily result from the use of construction equipment. The assessment of construction air quality impacts considers each of these potential sources. Construction emissions can vary substantially from day to day, depending on the level of activity, the specific type of operation and, for dust, the prevailing weather conditions.

Table 3.2-6 shows the estimated daily emissions associated with each construction phase. The worst-case construction emissions occur during construction of Phase 1. Daily NO_X, PM_{10}, and $PM_{2.5}$ emissions would exceed the SCAQMD regional threshold during Phases 1, 2, 3, and 4. It is mandatory for all construction projects in the South Coast Air Basin to comply with SCAQMD Rule 403 for Fugitive Dust. Specific Rule 403 control requirements include, but are not limited to, applying water in sufficient quantities to prevent the generation of visible dust plumes, applying soil binders to uncovered areas, reestablishing ground cover as quickly as possible, utilizing a wheel washing system to remove bulk material from tires and vehicle undercarriages before vehicles exit the project site, and maintaining effective cover over exposed areas. Compliance with Rule 403 would reduce $PM_{2.5}$ and PM_{10} emissions associated with construction activities by approximately 61 percent (SCAQMD 2007). This emissions reduction was taken into account in the unmitigated estimated daily construction emissions shown in Table 3.2-6. Therefore, the proposed project would result in a significant impact related to regional construction emissions. In addition to compliance with SCAQMD Rule 403, implementation of mitigation measures AIR-A through AIR-E is required.

Table 3.2-6 Estimated Peak Regional Daily Construction Emissions – Unmitigated

Construction Phase	Pounds Per Day					
	VOCs	NO_X	CO	SO_X	$PM_{2.5}$[1]	PM_{10}[1]
Phase 1	48	378	209	1	64	251
Phase 2	44	321	192	1	62	252
Phase 3	25	178	119	1	55	238
Phase 4	26	220	123	1	56	260
Phase 5	7	47	36	<1	16	69
Maximum Regional Total	48	378	209	1	64	260
Significance Threshold	*75*	*100*	*550*	*150*	*55*	*150*
Exceed Threshold?	No	Yes	No	No	Yes	Yes

[1] Emissions for fugitive dust were adjusted to account for a 61 percent control efficiency associated with SCAQMD Rule 403.
Source: Terry A. Hayes Associates 2011.

Operational Phase

During project operation, worker trips to the proposed project site would not increase compared to existing conditions. However, development of limited trails access within the SCRC would generate new vehicle trips to and from the site. These motor vehicles would be the predominate source of long-term emissions associated with the proposed project. Average daily traffic (ADT) would be approximately 25 vehicles during weekdays assuming one complete turnover during peak-hour traffic. Mobile source emissions were estimated using URBEMIS2007 based on the estimated number of vehicle trips. Weekday operational emissions are shown in Table 3.2-7. Regional emissions would not exceed SCAQMD significance thresholds during project operations. The impact would be less than significant.

Table 3.2-7 Estimated Regional Daily Operations Emissions

Emission Source	Pounds per Day					
	VOCs	NO_X	CO	SO_X	$PM_{2.5}$	PM_{10}
Mobile Sources	1	1	7	<1	<1	2
SCAQMD Threshold	*55*	*55*	*550*	*150*	*55*	*150*
Exceed Threshold?	No	No	No	No	No	No

Source: Terry A. Hayes Associates 2011.

AIR-2 *The proposed project would expose sensitive receptors to substantial pollutant concentrations from on-site emissions of criteria pollutants and TACs during construction.*

Localized Impacts

Construction Phase

The SCAQMD requires that construction projects include an analysis of localized emissions. Project sites larger than 5 acres are required to complete dispersion modeling. The proposed project site is larger than 5 acres; therefore, in accordance with SCAQMD methodology, the Industrial Source Complex-Short Term dispersion model was used to determine localized impacts. Results of the dispersion modeling are shown in Table 3.2-8.

Table 3.2-8 Estimated Peak Localized Construction Emissions – Unmitigated

Pollutant	Estimated Emissions (lbs/day)	Concentration at nearest sensitive receptor	Significance Threshold	Significant Impact?
$PM_{2.5}$	60	46 μg/m^3	10.4 μg/m^3	Yes
PM_{10}	246	212 μg/m^3	10.4 μg/m^3	Yes
NO_2	28	0.04 ppm	0.18 ppm	No
CO (1-Hour)	155	0.4 ppm	20 ppm	No
CO (8-Hour)	155	0.1 ppm	9 ppm	No

Source: Terry A. Hayes Associates 2011.

Dispersion modeling indicates that the maximum localized pollutant concentrations of $PM_{2.5}$ and PM_{10} would exceed the SCAQMD significance thresholds. Therefore, the proposed project would result in a significant impact related to localized construction emissions. Implementation of mitigation measures AIR-A through AIR-E is required.

Operational Phase

An exceedance of the state CO standards at an intersection is referred to as a CO hotspot. The SCAQMD recommends a CO hotspot evaluation of potential localized CO impacts when volume-to-capacity (V/C) ratios are increased by 2 percent at intersections with a level of service (LOS) ranking of D or worse. SCAQMD also recommends a CO hotspot evaluation when an intersection decreases in LOS by one level beginning when LOS changes from C to D.

During project operations related primarily to recreation use, no identified project intersections with a LOS of D or worse would increase by 2 percent. Additionally, no project intersections would decrease by one or more levels from a LOS C to D. No further analysis is necessary. Therefore, the proposed project would have a less than significant impact related to operational localized emissions.

Toxic Air Contaminants

Construction Phase

The greatest potential for TAC emissions during construction would be from diesel particulate emissions associated with heavy equipment operations at the project site and haul trucks trips during the import and export of materials to the project site. The haul truck route travels along Mulholland Drive between I-405 and the SCRC gate. A health risk assessment for the construction period was completed based on the SCAQMD *Health Risk Assessment Guidance for Analyzing Cancer Risks from Mobile Source Diesel Idling Emissions for CEQA Air Quality Analysis*. According to this document, the cancer risks from diesel particulate matter associated with heavy equipment operations and motor vehicles occur exclusively through the inhalation pathway. According to the SCAQMD methodology, health effects from carcinogenic air toxics are usually described in terms of individual cancer risk. This risk is a measurement of the probability that a person would contract cancer during a 70-year lifetime based upon a given exposure to TACs.

The proposed project would generate about 70,200 one-way truck trips, either inbound to or outbound from the SCRC. Construction at the project site would also involve the extensive operation of heavy diesel equipment. Based on information provided by the project design and engineering team, the exposure level was adjusted to account for 8 hours per day, 5 days per week, 48 weeks per year, and 4 years. The results of the HRA indicated that construction at the reservoir site would not exceed the estimated carcinogenic risk of 10 persons in 1 million threshold at the following sensitive receptor locations: American Jewish University, Roscomare Road Elementary School, and Stephen S. Wise Elementary School. However, the estimated carcinogenic risk over a 70-year lifetime would exceed the 10 persons in 1 million threshold at the closest residential land uses to the reservoir (14 persons in 1 million). Therefore, construction of the proposed project would result in a significant impact related to TACs. Implementation of mitigation measures AIR-C through AIR-E is required.

Operational Phase

The SCAQMD recommends that health risk assessments be conducted for substantial sources of diesel particulate emissions (e.g., truck stops and warehouse distribution facilities) and has provided guidance for analyzing mobile source diesel emissions (SCAQMD 2002). The proposed project would establish limited trails access within the SCRC, which would not generally generate diesel emissions. Maintenance of the buried reservoir would not require additional diesel truck trips to and from the site beyond existing conditions. Based on the limited activity of TAC sources, the proposed project would not warrant the need for a health risk assessment associated with on-site post-construction activities.

Typical sources of acutely and chronically hazardous TACs include industrial manufacturing processes and automotive repair facilities. The proposed project would not include any of these potential sources. Thus, operation of the proposed project would not release substantial amounts of TACs. The operational impact would be less than significant.

AIR-3 *The proposed project would not generate GHG emissions, either directly or indirectly, that would have a significant impact on the environment or conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHG.*

GHG emissions were calculated for construction activity and for on-road vehicle operations associated with the recreational use of the site. Based on SCAQMD guidance, the emissions summary includes construction emissions averaged over a 30-year span. As shown in Table 3.2-9, the proposed project would generate approximately 884 metric tons of CO_2e per year. GHG emissions would not exceed the 10,000 metric tons of CO_2e per year significance threshold. The impact would be less than significant. In addition, construction activity would incorporate source reduction techniques and recycling measures to divert waste from landfills, further reducing GHG emissions produced during construction.

Table 3.2-9 Estimated Annual Greenhouse Gas Emissions

Scenario and Source	Carbon Dioxide Equivalent (metric tons per year)
Construction Phase 1	2,543
Construction Phase 2	6,826
Construction Phase 3	11,038
Construction Phase 4	1,175
Construction Phase 5	650
Total Construction Emissions	22,232
Total Construction Emissions Amortized[1]	741
Operational Mobile Source Emissions[2]	143
Total Annual Emissions	884
Significance Threshold	*10,000*
Exceed Threshold?	No

[1] Based on SCAQMD guidance, the emissions summary includes construction emissions amortized over a 30-year span.
[2] Mobile source emissions were weighted to account for both weekday and weekend emissions.
Source: Terry A. Hayes Associates 2011.

Power usage, a primary contributor of GHG emissions, would not increase significantly during operation of the proposed project. The proposed project would include recreational land uses that would not constitute a significant source of operational emissions. The operations of the proposed project would not conflict with any state or local climate change policy or regulation. The impact would be less than significant.

3.2.5 Mitigation Measures

AIR-A Heavy-duty equipment operations shall be suspended during first and second stage smog alerts.

AIR-B Equipment and vehicle engines shall be maintained in good condition and in proper tune per manufacturers' specifications.

AIR-C Based on a 2015 start of construction, all off-road construction diesel engines not registered under CARB's Statewide Portable Equipment Registration Program and that have a rating of 50 horsepower (hp) or more shall meet, at a minimum, the Tier 4 California Emission Standards for Off-Road Compression-Ignition Engines as specified in California Code of Regulations, Title 13, Section 2423(b)(1) unless such engine is not available for a particular item of equipment. In the event a Tier 4 engine is not available for any off-road equipment larger than 100 hp, that equipment shall be equipped with a Tier 3 engine. Equipment properly registered under and in compliance with CARB's Statewide Portable Equipment Registration Program shall be considered in compliance with this mitigation measure.

AIR-D Electricity shall be utilized from power supply sources rather than temporary gasoline or diesel power generators, as feasible.

AIR-E Heavy-duty trucks shall be prohibited from idling in excess of 5 minutes, both on and off site, except as follows:

- When verifying that the vehicle is in safe operating condition, or
- When the vehicle is positioning or providing a power source for equipment or operations, or
- While operating defrosters, heaters, air conditioning, or any other device to prevent a health or safety emergency.

3.2.6 Significance After Mitigation

Construction Phase

A 5 percent reduction in construction equipment exhaust was used to estimate emissions reductions due to the implementation of mitigation measures AIR-A through AIR-E. As shown in Table 3.2-10, construction emissions of NO_X, PM_{10}, and $PM_{2.5}$ would still exceed SCAQMD significance thresholds. Therefore, the proposed project would result in a significant and unavoidable impact related to regional construction emissions.

Table 3.2-10 Estimated Peak Regional Daily Construction Emissions – Mitigated

	Pounds Per Day					
Construction Phase	**VOCs**	**NO_X**	**CO**	**SO_X**	**$PM_{2.5}$[1]**	**PM_{10}[1]**
Phase 1	46	359	198	1	63	250
Phase 2	41	305	192	1	61	251
Phase 3	24	169	113	<1	55	238
Phase 4	25	209	116	<1	56	259
Phase 5	7	45	34	<1	16	69
Maximum Regional Total	46	359	198	1	63	259
Significance Threshold	*75*	*100*	*550*	*150*	*55*	*150*
Exceed Threshold?	No	Yes	No	No	Yes	Yes

[1] Emissions for fugitive dust were adjusted to account for a 61 percent control efficiency associated with SCAQMD Rule 403.
Source: Terry A. Hayes Associates 2011.

As shown in Table 3.2-11, mitigated localized construction emissions would continue to exceed the SCAQMD localized thresholds for $PM_{2.5}$ and PM_{10}. Therefore, the proposed project would still result in a significant and unavoidable impact related to localized construction emissions.

Table 3.2-11 Estimated Peak Localized Construction Emissions – Mitigated

Pollutant	**Estimated Emissions (lbs/day)**	**Concentration at nearest sensitive receptor**	**Significance Threshold**	**Significant Impact?**
$PM_{2.5}$	59	45 $\mu g/m^3$	10.4 $\mu g/m^3$	Yes
PM_{10}	245	212 $\mu g/m^3$	10.4 $\mu g/m^3$	Yes
NO_2	26	0.04 ppm	0.18 ppm	No
CO (1-Hour)	147	0.4 ppm	20 ppm	No
CO (8-Hour)	147	0.1 ppm	9 ppm	No

Source: Terry A. Hayes Associates 2011.

Mitigation measures AIR-C through AIR-E, although difficult to quantify, would reduce TAC exposure. However, heavy-duty trucks would continue to emit diesel particulate matter resulting in an increased health risk to nearby residential land uses. Therefore, construction TAC emissions would result in a significant and unavoidable impact.

Operational Phase

As discussed above, operational air quality impacts would be less than significant without the implementation of mitigation.

CHAPTER 3.3
BIOLOGICAL RESOURCES

This chapter evaluates existing biological resources at the Upper Stone Reservoir site (and surrounding areas as necessary) and potential impacts to those resources associated with implementation of the proposed project. Information in this chapter was gathered through literature review, examination of available databases, and field reconnaissance. Biological surveys were conducted as part of the proposed project by Garcia & Associates in spring 2008. Additional biological surveys were conducted by AECOM on March 18, 2009; April 13, 2009; and June 7, 2010 due to refinements in the project concept plan. Potential impacts to biological resources associated with the proposed project were determined from the results presented in the Biological Survey Reports (see Appendix E).

3.3.1 Environmental Setting

Upper Stone Reservoir itself is asphalt lined and does not contain any vegetation or habitat, only treated drinking water. Therefore, aquatic surveys of Upper Stone Reservoir were not conducted. Other than Upper and Lower Stone Reservoirs, chlorination station, dam keeper's house, and water filtration plant, the SCRC remains essentially undeveloped.

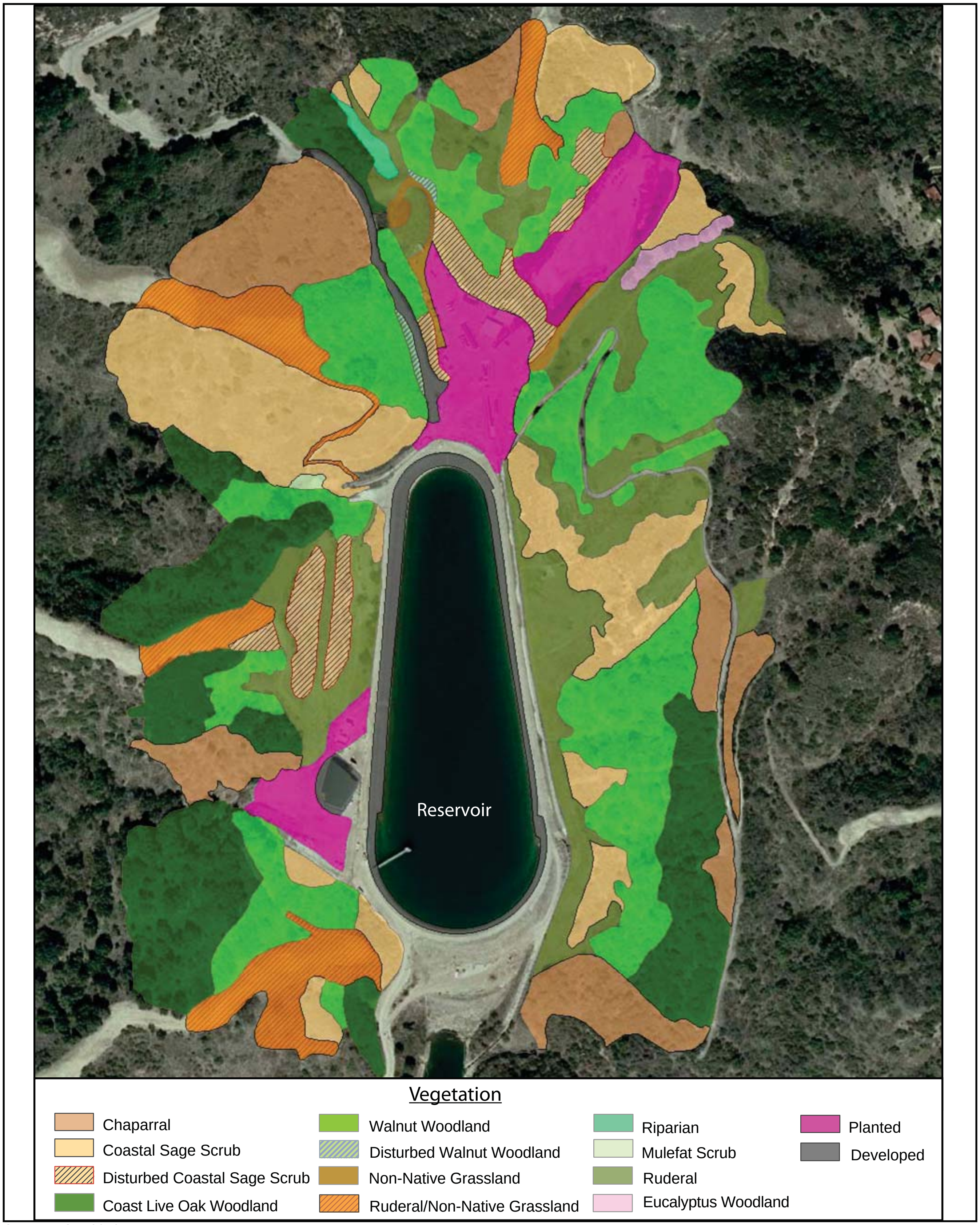
Upper Stone Reservoir is primarily surrounded by slopes containing a dense mosaic of mature, high-quality native habitats, sectioned by firebreaks radiating from the middle of the canyon outward to the east, west, and north slopes. The firebreaks contain cover of non-native, ruderal habitat that is mowed at regular intervals. There are access roads to the north, west, and east slopes. Three areas surrounding Upper Stone Reservoir have been cleared and planted with a variety of trees and shrubs. The plantings are immature and are supported by temporary irrigation systems.

Vegetation and Cover Types

A total of eight plant communities and undeveloped cover types were identified within the survey area: coastal sage scrub, chaparral, coast live oak woodland, California walnut woodland, riparian, non-native grassland, ruderal, and planted (see Figure 3.3-1).

Coastal Sage Scrub

Coastal sage scrub occurs on relatively dry, often steep, gravelly or rocky slopes below 3,000 feet. Major plant species found in this community are shrubs ranging one to six feet tall, and may also include small trees. Sage species such as black sage (*Salvia mellifera*), purple sage (*Salvia leucophylla*), and other plants, including California sagebrush (*Artemisia californica*), California buckwheat (*Eriogonum fasciculatum*), and coyote brush (*Baccharis pilularis*), are characteristic of coastal sage scrub (Ornduff 2003). Because of its function as valuable wildlife habitat for both common and special-status plant and animal species, and because of its declining quantity in the state, coastal sage scrub is generally considered to be of special status by the California Department of Fish and Game (CDFG).



Source: ESRI 2010

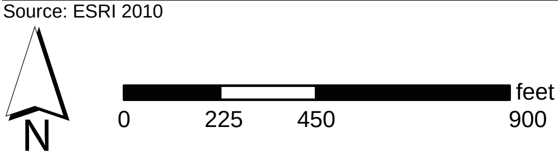


Figure 3.3-1
Vegetation and Cover Types

Coastal sage scrub near Upper Stone Reservoir is characterized by California sagebrush, black sage, California encelia (*Encelia californica*), blue elderberry (*Sambucus mexicana*), and laurel sumac (*Malosma laurina*). Other plant species observed in coastal sage scrub habitat on site include sticky monkeyflower (*Mimulus aurantiacus*), wild cucumber (*Marah macrocarpus*), poison oak (*Toxicodendron diversilobum*), sugar bush (*Rhus ovata*), chaparral currant (*Ribes malvaceum*), California peony (*Paeonia californica*), mulefat (*Baccharis salicifolia*), coyote brush, and ripgut grass (*Bromus diandrus*). Coastal sage scrub and disturbed phases of coastal sage scrub are found throughout the project site, intergrating with other plant communities.

Chaparral

Chaparral is typically shrub-dominated vegetation which grows at low elevations away from the immediate coast (Barbour et. al. 1993). With a dense, often impenetrable canopy, the ground underneath or among chaparral shrubs is often deficient in herbaceous plant species. Manzanita (*Arctostaphylos* spp.), California-lilac (*Ceanothus* spp.), oak (*Quercus* spp.), and chamise (*Adenostoma fasciculatum*) are some characteristic chaparral plants (Ornduff 2003).

Chaparral in the SCRC is characterized by dense cover of chamise (*Adenostoma fasciculatum*), sugar bush, poison oak, and laurel sumac. Other plant species observed in chaparral habitat on site include sticky monkeyflower, blue elderberry, California sagebrush, and wild cucumber (LADWP 1993). Within the upper portion of the SCRC, chaparral is found on the west-facing slopes surrounding Upper Stone Reservoir.

Coast Live Oak Woodland

Coast live oak woodland is a community with only one dominant tree, coast live oak (*Quercus agrifolia*), and a poorly developed shrub layer that may include toyon (*Heteromeles arbutifolia*), gooseberries and/or currants, laurel sumac, or blue elderberry (Holland 1986). The herbaceous layer is described as continuous and dominated by ripgut grass and other introduced species.

Coast live oak woodland near Upper Stone Reservoir is dominated by mature coast live oak, with laurel sumac, California sagebrush, and poison oak. Coast live oak woodland occurs on slopes both east and west of Upper Stone Reservoir, where it integrates with California walnut woodland.

California Walnut Woodland

California walnut woodland is typically dominated by southern California black walnut (*Juglans californica* var. *californica*) and coast live oak. The relatively open tree canopy cover allows for the development of a grassy understory with introduced winter-active annuals that complete most of their growth cycle before the deciduous walnuts leaf out in spring (Holland 1986). California walnut woodlands occur from the south side of the San Gabriel Mountains and Santa Ana Mountains, generally ranging in elevation from 500 to 3,000 feet above sea level. California walnut woodlands typically intergrate with chaparral, coastal sage scrub, and oak woodland communities. Because of its high biological value and declining presence in California, this community is considered of special status by CDFG.

California walnut woodland near Upper Stone Reservoir is dominated by California walnut and coast live oak, with an understory of laurel sumac, poison oak, and blue elderberry. California walnut woodland occurs throughout the slopes on both the east and west sides of Upper Stone Reservoir.

Riparian

To the north of Upper Stone Reservoir there is a narrow drainage feature containing various vegetation, including that which is typically found in riparian areas. At its southern end, the drainage contains plants such as mulefat, willow (*Salix* sp.), mugwort (*Artemisia douglasiana*), poison hemlock (*Conium maculatum*), and cattail (*Typha* sp.). Water was not present at the time of the survey.

Non-Native Grassland

Non-native grassland is characterized by dense to sparse cover of annual grasses (Holland 1986). It can be associated with native wildflowers, especially in years of favorable rainfall. Plants in this community are usually dead and persist as seeds through the summer-fall dry season.

Non-native grassland near Upper Stone Reservoir is characterized by dominant cover of non-native annuals such as ripgut grass, soft brome (*Bromus hordeaceus*), cheatgrass (*Bromus tectorum*), slender wild oat (*Avena barbata*), tocalote (*Centaurea melitensis*), filaree (*Erodium cicutarium*), and sourclover (*Melilotus indicus*). Non-native grassland occurs in areas that have been cleared for firebreaks and fire roads.

Ruderal

Ruderal habitat is similar to non-native grassland in that it is dominated by non-native species; in these areas the soils were either recently or historically disturbed. Ruderal habitat contains sparse to dense cover of plants such as ripgut grass, black mustard (*Brassica nigra*), tocalote, horehound (*Marrubium vulgare*), poison hemlock, castor bean (*Ricinus communis*), filaree, sourclover, carnation spurge (*Euphorbia terracina*), and onionweed (*Asphodelus fistulosus*). In some areas, ruderal habitat is intermixed with non-native grassland.

Planted

There are three areas in the vicinity of Upper Stone Reservoir that have been previously disturbed and are currently planted with native species, not all of which are typical to the existing canyon environment: one just north of Upper Stone Reservoir, another northeast of this area, and one surrounding the chlorination station. The north and northeast planting areas have overhead spray irrigation systems. Typical vegetation in the planted areas include western sycamore (*Platanus racemosa*), coast live oak, toyon, California lilac (*Ceanothu*s sp.), purple needlgrass (*Nasella pulchra*), and deergrass (*Muhlenbergia rigens*).

Wildlife Species Observed

Fifteen species of wildlife were observed in the SCRC during site surveys: California towhee (*Pipilo crissalis*), northern rough-winged swallow (*Stelgidopteryx serripennis*), turkey vulture (*Cathartes aura*), mourning dove (*Zenaida macroura),* northern mockingbird (*Mimus polyglottos*), western scrub jay (*Aphelocoma californica*), bushtit (*Psaltriparus minimus*), lesser goldfinch (*Carduelis psaltria*), house finch (*Carpodacus mexicanus*), American crow (*Corvus brachyrhynchos*), red-tailed hawk (*Buteo jamaicensis*), Anna's hummingbird *(Calypte anna)*, black phoebe (*Sayornis nigricans*), and western diamondback rattlesnake (*Crotalus atrox*). Some mallards (*Anas platyrhynchos*) were also observed swimming in Upper Stone Reservoir on one occasion.

Sensitive Biological Resources

Special status plant and wildlife species, commonly referred to as sensitive species, include species that are legally protected under the Federal Endangered Species Act, the California Endangered Species Act, the California Native Plant Protection Act, or local conservation ordinances. Included are plant species listed by the California Native Plant Society and wildlife species that are of special concern to the CDFG. Special status species can also be those that are considered by CDFG to be sufficiently rare to qualify for such protection.

A literature review was conducted to determine sensitive plant species, animal species, and vegetation communities with the potential to occur in the SCRC and the vicinity. The CDFG's *California Natural Diversity DataBase RareFind 3 program* (2009) and the California Native Plant Society *Inventory of Rare and Endangered Plants* (2009) were reviewed for any information on known occurrences of sensitive species and communities within the Beverly Hills, Topanga, Canoga Park, Van Nuys, Burbank, and Hollywood U.S. Geological Survey topographic 7.5 minute quadrangles. Sensitivity status, general habitat requirements, and potential habitat presence or absence within the SCRC for the sensitive plant and wildlife species identified during the database review are provided in Appendix E. Reconnaissance surveys were also conducted to determine the potential for sensitive species to occur within the SCRC. Survey methods and results are also detailed in Appendix E.

Sensitive Plant Species

Based on the California Natural Diversity DataBase query results and general habitat characteristics, Braunton's milk-vetch, Nevin's barberry, and San Fernando Valley spineflower, Santa Monica dudleya, Plummer's mariposa lily, mesa horkelia, and Davidson's bush-mallow have the potential to occur within the SCRC. Therefore, focused surveys for these species were conducted in spring of 2008 in those areas to be disturbed during project construction. Braunton's milk-vetch, Nevin's barberry, and San Fernando Valley spineflower were not detected during the surveys. These surveys also determined that there is no suitable micro habitat within the areas of disturbance for Santa Monica dudleya, Plummer's mariposa lily, mesa horkelia, or Davidson's bush-mallow to occur (Garcia 2008).

In addition, based on the California Natural Diversity DataBase query results, the southern California black walnut is likely to occur within the SCRC and was observed in the SCRC in 1990 (LADWP 1993). During surveys conducted in 2009 and 2010, this species was not observed within the areas of disturbance (AECOM 2010).

Sensitive Wildlife Species

Based on the California Natural Diversity DataBase query results and general habitat characteristics, two sensitive wildlife species have the potential to occur within the SCRC. Coastal western whiptail was detected within chaparral habitat within the SCRC, northwest of Upper Stone Reservoir, during focused surveys that were conducted in 1992 (LADWP 1993). Coast horned lizard was not detected during these surveys. Neither species was detected during surveys conducted in 2008 (Garcia 2008) or 2010 (AECOM 2010).

Sensitive Habitats

Sensitive habitats include those that are considered rare within the region, that support sensitive flora and/or fauna, or that function as linkages for wildlife movement. According to the California Natural Diversity DataBase query results, five sensitive plant communities were identified as having the potential to occur in the vicinity of the SCRC. Only one sensitive habitat, California Walnut Woodland, was observed to occur within the SCRC (see Figure 3.3-1). In addition to the plant communities identified in the California Natural Diversity DataBase query results, because of its function as valuable wildlife habitat for both common and special-status plant and animal species, and because of its declining quantity in the state, coastal sage scrub is also generally considered to be of special status by CDFG. As discussed above, coastal sage scrub also occurs within the SCRC.

Wildlife Corridors and Habitat Linkages

In an urban context, a wildlife migration corridor can be defined as a linear landscape feature of sufficient width to allow animal movement between two patches of comparatively undisturbed habitat, or between a patch of habitat and some vital resources. Regional corridors are defined as those linking two or more large areas of natural open space, and local corridors are defined as those allowing resident animals to access critical resources (food, cover, and water) in a smaller area that might otherwise be isolated by urban development.

Wildlife migration corridors are essential, especially in urban settings, for the sustenance of healthy and genetically diverse animal communities. At a minimum, they promote colonization of habitat and genetic variability by connecting fragments of like habitat, and they help sustain individual species distributed in and among habitat fragments. Habitat fragments, by definition, are separated by otherwise foreign or inhospitable habitats, such as urban/suburban tracts. Isolation of populations can have many harmful effects and may contribute significantly to local species extinction.

A viable wildlife migration corridor consists of more than a path between habitat areas. To provide food and cover for transient species, as well as resident populations of less mobile animals, a wildlife migration corridor must also include pockets of vegetation.

The project site provides suitable nesting habitat for migratory and resident bird populations. In addition, due to the location of the project site within the Santa Monica Mountains and the undeveloped nature of the SCRC, the site provides east-west connectivity and habitat continuity between large areas of open space. The SCRC acts as a non-contiguous linkage between Topanga Canyon State Park and Mandeville Canyon to the west and Franklin Canyon and other undeveloped areas within the Hollywood Hills to the east. As such, the project site serves as a wildlife corridor.

LADWP (1993) notes that the Upper and Lower Stone Reservoirs "provide open water habitat for numerous migrating and breeding waterfowl. Though not originally intended to function as waterfowl stops, reservoirs present much of the remaining open water habitat left in Los Angeles basin. The reservoirs may not be crucial to the survival of waterfowl, but loss of migration stops and overwintering grounds adds to the steady decline of these species within the Pacific flyway."

3.3.2 Regulatory Setting

Clean Water Act Sections 401 and 404

The Clean Water Act governs pollution control and water quality of waterways throughout the U.S. Its intent, in part, is to restore and maintain the biological integrity of the nation's waters. The goals and standards of the Clean Water Act are enforced through permit provisions. Section 401 requires certification from the Regional Water Quality Control Board that the proposed project shall be in compliance with established water quality standards. Section 404 of the Clean Water Act requires an individual or general permit from the U.S. Army Corps of Engineers for discharge into "waters of the U.S."

California Department of Fish and Game Code Sections 1600-1707

The California Fish and Game Code regulates the taking or possession of birds, mammals, fish, amphibians, and reptiles, as well as disturbance of natural resources such as wetlands and waters of the state. It includes the California Endangered Species Act (Sections 2050-2115), Streambed Alteration Agreement regulations (Sections 1600-1616), provisions for legal hunting and fishing, and tribal agreements for activities involving take of native wildlife. Any proposed impact to state-listed plant or wildlife species or state jurisdictional waters within or adjacent to the project area would require a permit under the California Endangered Species Act or a Streambed Alteration Agreement, respectively.

Under Sections 1600-1607 of the California Department of Fish and Game code, CDFG regulates activities that would alter the flow, bed, channel, or bank of streams and lakes. The limits of CDFG jurisdiction are defined in the code as the "bed, channel or bank of any river, stream or lake designated by the department in which there is at any time an existing fish or wildlife resource or from which these resources derive benefit." In practice, CDFG usually extends its jurisdictional limit to the top of a stream or lake bank, or outer edge of the riparian vegetation, whichever is wider. Riparian habitats do not always have identifiable hydric soils or clear evidence of wetland hydrology as defined by the U.S. Army Corps of Engineers. Therefore, CDFG wetland boundaries often extend beyond U.S. Army Corps of Engineers wetland boundaries, which sometimes include only portions of the riparian habitat adjacent to a river, stream, or lake. Jurisdictional boundaries under Sections 1600-1607 may encompass an area that is greater than that under the jurisdiction of Section 404 (Cylinder et al. 1995).

Migratory Bird Treaty Act

The Migratory Bird Treaty Act of 1918, as amended in 1972, makes it unlawful, unless permitted by regulations, to "pursue; hunt; take; capture; kill; attempt to take, capture or kill; possess; offer for sale; sell; offer to purchase; purchase; deliver for shipment; ship; cause to be shipped; deliver for transportation; transport; cause to be transported; carry or cause to be carried by any means whatever; receive for shipment, transportation, or carriage; or export, at any time, or in any manner, any migratory bird, included in the terms of this Convention …for the protection of migratory birds … or any part, nest, or egg of any such bird" (16 USC 703). In 1972, the Migratory Bird Treaty Act was amended to include protection for migratory birds of prey (e.g., raptors). Six families of raptors occurring in North America were included in the amendment: *Accipitridae* (kites, hawks, and eagles); *Cathartidae* (New World vultures); *Falconidae* (falcons and caracaras); *Pandionidae* (ospreys); *Strigidae* (typical owls); and *Tytonidae* (barn owls).

City of Los Angeles Native Tree Protection Ordinance

The City of Los Angeles Ordinance No. 177404 (City of Los Angeles Municipal Code Section 17.05.R) prohibits damage or removal without a permit of southern California black walnut, western sycamore, California bay (*Umbellularia californica*), and any trees of the oak genus (*Quercus*), excluding scrub oak (*Quercus dumosa*). Protected trees are those that measure 4 inches or more in cumulative diameter at 4.5 feet above the ground level at the base of the tree. Removal includes any act which would cause a protected tree to die, including but not limited to acts which inflict damage upon the root system or other part of the tree by fire, application of toxic substances, operation of equipment or machinery, or by changing the natural grade of land by excavation or filling in the drip line area around the trunk.

3.3.3 Environmental Impacts

Thresholds of Significance

Direct and indirect impacts to biological resources that would result from implementation of the proposed project are discussed in this section. Direct impacts are quantified by comparing the proposed project footprint with the biological resources within the project area.

Indirect impacts are not easily quantifiable; they include short-term indirect impacts related to construction and/or long-term indirect impacts associated with the location of development or activities in proximity to biological resources. During construction of the proposed project, short-term indirect impacts may include soil erosion and runoff, which could impact plant species, or dust and noise, which could temporarily disrupt habitat and species health. As discussed in Chapter 2, all project grading and construction would be subject to the standard restrictions and requirements that address erosion and runoff, including compliance with the federal Clean Water Act, the National Pollutant Discharge Elimination System Permit process, and the requirements for preparation of a Storm Water Pollution Prevention Plan. Long-term indirect impacts include increased site use, noise, increased opportunity of invasion by exotic plant and wildlife species, soil erosion, and litter.

As part of the Initial Study (see Appendix A), it was determined that the proposed project would not conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan. Accordingly, this issue is not further analyzed in the EIR.

Per the CEQA Guidelines, the proposed project would have a significant impact on biological resources if it would:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the CDFG or USFWS;

- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the CDFG or USFWS;

- Have a substantial adverse effect on any federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;

- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites; or

- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.

Impact Analysis

BIO-1: *The proposed project would have a substantial adverse effect, either directly or through habitat modifications, on species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the CDFG or USFWS.*

<u>*Construction*</u>

Much of the area surrounding Upper Stone Reservoir contains cover of California walnut woodland and coastal sage scrub, plant communities considered sensitive by the CDFG. Construction of the proposed project would require disturbance of the slopes above the eastern edge of Upper Stone Reservoir associated with the landslide stabilization task. The landslide stabilization would involve a combination of grading and the use of soil nails (see Figure 2-5). These activities have the potential to result in direct removal of both walnut woodland and coastal sage scrub communities. The impact would be significant, and implementation of mitigation measure BIO-A is required. Although an area northeast of Upper Stone Reservoir designated as the stockpile area (see Figure 2-4) would be cleared of vegetation and temporarily filled with excavated soil during construction, this area was previously disturbed and revegetated as part of the Lower Stone Reservoir water quality improvements. The stockpile area does not contain sensitive plant species or habitat types. It was planted with native species that are not typical to the existing canyon environment within the SCRC. Therefore, removal of vegetation within this area would not significantly impact sensitive species. Further, as discussed in Chapter 2, the stockpile area would again be revegetated at the completion of the proposed project.

Southern California black walnut trees themselves are also considered a sensitive plant species by CDFG. Removal of or damage to this sensitive plant species would create a significant impact, and implementation of mitigation measure BIO-A is required.

Indirect impacts would potentially occur to native vegetation adjacent to Upper Stone Reservoir, including fugitive dust deposition on the native vegetation during construction, soil compaction within the critical root zone of native trees, and increased soil erosion. These indirect temporary impacts would be significant. Indirect impacts to adjacent habitats during construction would be avoided or minimized through the use of appropriate Best Management Practices. However, implementation of mitigation measures BIO-B through BIO-E is also required.

Two sensitive wildlife species, coast (San Diego) horned lizard and coastal western whiptail, have a moderate to high potential to occur within the SCRC because suitable habitat exists on site. The coastal western whiptail was detected in chaparral habitat northwest of Upper Stone Reservoir in 1992. It can also occur in walnut woodland communities. The coast horned lizard, although not detected at the SCRC, has the potential to occur in coastal sage scrub and chaparral communities on site. If the vegetation communities are occupied by sensitive species when vegetation removal is conducted, the species would be directly impacted. Temporary, indirect impacts due to construction activities, such as increased human presence (i.e., construction workers), noise, erosion, siltation into adjacent areas, and dust, would also adversely affect these species. Construction of the proposed project would involve disturbance to and removal of chaparral, coastal sage scrub, walnut woodland, and coast live oak communities primarily located east of Upper Stone Reservoir. As such, the impact to the coast horned lizard and the coastal western whiptail would be significant. Implementation of mitigation measure BIO-F is required.

The SCRC contains suitable conditions to support nesting migratory native birds protected under the Migratory Bird Treaty Act. Significant direct impacts to these species would occur associated with tree removal and/or vegetation clearance which could result in impacts to nests or through the direct removal of nests if these activities occur during the nesting/breeding bird season. These temporary, direct impacts would be significant, and implementation of mitigation measure BIO-G is required.

Operations

Permanent, indirect impacts due to proposed project operation of limited trails access within the SCRC could adversely impact both sensitive plant and wildlife species. During operation, noise generated from site visitors, erosion, trash, disturbance of off-trail areas, and increased invasion by exotic species could occur. Erosion and disturbance of off-trail areas could damage plant species, and invasion by exotic species could outcompete existing sensitive plant species and habitats. The result would be a reduction of sensitive plant species and habitats. This would indirectly impact the sensitive wildlife species that rely on the existing vegetation and habitats provided within the SCRC. Noise and disturbance of off-trail areas could cause sensitive wildlife species to migrate away from the SCRC. As such, permanent, indirect impacts to sensitive species would be significant. Implementation of mitigation measures BIO-H through BIO-J is required.

BIO-2: *The proposed project would not have a substantial adverse effect on riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the CDFG and USFWS.*

An area located northwest of Upper Stone Reservoir contains a drainage channel that includes riparian vegetation. However, no construction activity would occur in this area. No impact to riparian habitat would occur.

BIO-3: *The proposed project would not have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.*

The project area does not contain any federally protected wetlands; therefore, no impacts would occur. No mitigation is required.

BIO-4: *The proposed project would not interfere substantially with the movement of native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.*

The project site does act as part of a non-contiguous linkage between two or more large areas of open space. However, the majority of the SCRC would remain undeveloped, allowing continued wildlife migration within and through the site. Both Upper and Lower Stone Reservoirs currently provide open water habitat for migrating and breeding waterfowl. The proposed project would permanently cover the open water surface of Upper Stone Reservoir. However, this is not considered a significant impact because there is adequate water available for birds and waterfowl within the uncovered Lower Stone Reservoir, which will remain an open water body. No mitigation is required.

BIO-5: *The proposed project would conflict with local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.*

The City of Los Angeles Ordinance No. 177404 (City of Los Angeles Department of City Planning 2006) prohibits damage or removal of trees of the oak genus (except scrub oak), southern California black walnut, western sycamore, and California Bay without a permit. The SCRC contains numerous coast live oak, southern California black walnuts, and western sycamores in areas that would be disturbed during construction, specifically in the stockpile area and landslide stabilization areas. Impacts to protected trees during construction, including removal and/or damage, would conflict with the City's tree protection ordinance. Removal of a protected tree requires a removal permit from the City of Los Angeles Board of Public Works. The impact would be significant, and implementation of mitigation measure BIO-B is required.

3.3.4 Mitigation Measures

BIO-A Prior to commencement of proposed project construction, a qualified restoration ecologist shall prepare a formal restoration plan to implement the replanting of walnut woodland and coastal sage scrub areas disturbed during project construction. Impacts to walnut woodland and coastal sage scrub communities shall be mitigated at a ratio of 3:1, and impacts to areas of disturbed walnut woodland and coastal sage scrub communities (i.e., low-quality habitat) shall be mitigated at a ratio of 1:1. These areas shall be replanted in areas near or adjacent to the existing walnut woodland and coastal sage scrub communities. Implementation of the restoration plan shall occur within one year of completion of construction. A 3- to 5-year maintenance and monitoring program shall be conducted to ensure that a native plant cover is achieved and aggressive nonnative species do not out-compete the native species.

BIO-B All coast live oak, southern California black walnuts, and western sycamores that are removed or otherwise impacted shall be replaced at a minimum 2:1 ratio of the same species with a minimum 15-gallon specimen measuring one inch or more in diameter at a point one foot above the base, and not less than 7 feet in height, measured from the base.

BIO-C Prior to the start of construction, to minimize incidental impacts to adjacent vegetation, the construction contractor shall place construction fencing (chain link, silt fencing, or other fencing as appropriate) along the construction limits of work. The City of Los Angeles Department of Water and Power shall be responsible for hiring a qualified biologist to inspect the fencing upon installation and monthly thereafter for the duration of the project. The construction contractor shall be responsible for any improvements or repairs deemed necessary by the biologist.

BIO-D Best management practices shall be employed during construction to assure that no discharge of debris, soil, sand, construction waste, cement or concrete washings, asphalt, paint, oil, or other harmful substances occurs in any potential nearby drainages. None of these materials shall be placed where they may run off into potential jurisdictional areas. Clean-up of all spills shall begin immediately. Stationary heavy equipment such as motors, generators, and welders shall not be placed in potential jurisdictional areas and shall have suitable containment to handle a spill or leak.

BIO-E Activities associated with the proposed project, such as the use of construction vehicles and equipment may facilitate the spread of invasive and/or noxious weeds by inadvertently transporting the seeds or loose plant remnants on tires or the underside of equipment. A Weed Control Plan shall be prepared to minimize the spread of invasive and/or noxious weeds. The Weed Control Plan shall have a complete list of construction and restoration techniques and measures to be implemented to reduce the spread of noxious and invasive weeds. These measures shall include, but are not limited to: the locations of existing weed populations; measures to control introduction and spread of noxious weeds in the vicinity of Upper Stone Reservoir; worker training; inspection procedures for construction materials and equipment; post-construction monitoring for noxious weeds; and eradication and control methods.

BIO-F Prior to the start of construction, a qualified biologist shall conduct focused pre-construction surveys for the coastal western whiptail and coast (San Diego) horned lizard in the areas to be disturbed by construction activities. If encountered, the species shall be relocated to an approved location based on consultation with the California Department of Fish and Game. In addition, a qualified biologist shall monitor construction activity within coastal sage scrub, chaparral, riparian, and walnut woodland communities to ensure that construction equipment and construction activities do not directly impact coastal western whiptail and coast (San Diego) horned lizard. Species that are observed during construction shall be relocated to an approved location based on consultation with the California Department of Fish and Game.

BIO-G Project-related activities such as tree removal or vegetation clearance that would be likely to have the potential to disturb suitable bird nesting habitat shall be prohibited from February 15 through September 15 unless a qualified biologist surveys the construction area prior to disturbance to confirm the absence of active nests. Disturbance shall be defined as any activity that physically removes and/or damages vegetation or habitat. Surveys shall be conducted weekly, beginning no earlier than 30 days and ending no later than 3 days prior to the commencement of disturbance. If an active nest is discovered, disturbance within a buffer area surrounding the nest site shall be prohibited until nesting is complete; the buffer distance shall be determined by the biological monitor in consideration of species sensitivity and existing nest site conditions. Limits of the buffer area shall be demarcated with flagging or fencing. Once a flagged nest is determined to be no longer active, the biological monitor shall remove all flagging and construction activities may proceed.

BIO-H Signs shall be posted near sensitive biological resources and sensitive habitat areas to educate the public to avoid disturbance to these resources. The Los Angeles Department of Water and Power shall post educational signage at trail heads emphasizing the protection of all natural features within the SCRC.

BIO-I In conjunction with the City of Los Angeles Department of Recreation and Parks or the Santa Monica Mountains Conservancy, the Los Angeles Department of Water and Power shall develop and implement a management plan for operation of the public trails system. At a minimum, the plan shall include methods and provisions for: maintenance of the parking area and trails; invasive weed avoidance and removal; routine patrolling of the trails for litter pick up and inspection for vandalism, erosion, and other damage; and regular closure rotation of trails to minimize erosion and disturbance to habitat.

BIO-J If at any time disturbance to a sensitive habitat area is suspected, the City of Los Angeles Department of Recreation and Parks or the Santa Monica Mountains Conservancy shall temporarily or permanently close the area for rest or restoration.

3.3.5 Significance After Mitigation

As discussed in impact BIO-1, project construction has the potential to adversely impact sensitive plant species, sensitive habitats, protected trees, sensitive wildlife species, and nesting migratory birds. With implementation of mitigation measures BIO-A through BIO-G, direct and indirect impacts to sensitive species and nesting migratory birds would be reduced to a less than significant level. Implementation of mitigation measures BIO-H through BIO-J would minimize impacts to sensitive plant and wildlife species during operation of the SCRC for limited trails access. The impact would be mitigated to a less than significant level.

As discussed in BIO-2 through BIO-4, impacts to riparian habitat, wetlands, and wildlife migration would not be significant.

To mitigate for impacts to protected oak, sycamore, and walnut trees, as discussed in BIO-5, implementation of mitigation measure BIO-B is required. With implementation of mitigation, the impact would be less than significant.

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CHAPTER 3.4
CULTURAL RESOURCES

A Phase I Cultural Resources Assessment was prepared for the proposed project in April 2009 and updated in October 2010 due to refinements in the project concept plan (see Appendix F). This chapter summarizes the results and conclusions presented in the report.

3.4.1 Prehistoric Setting

The earliest evidence of occupation in the Los Angeles area dates to at least 9,000 years before present and is associated with the a period known as the Millingstone Cultural Horizon (Wallace 1955; Warren 1968). Departing from the subsistence strategies of their nomadic big-game hunting predecessors, Millingstone populations established more permanent settlements. These settlements were primarily located on the coast and in the vicinity of estuaries, lagoons, lakes, streams, and marshes, where a variety of resources were exploited, including seeds, fish, shellfish, small mammals, and birds.

Although many aspects of the Millingstone culture persisted, by 3,500 years before present a number of socioeconomic changes occurred (Erlandson 1994; Wallace 1955; Warren 1968). These changes are associated with the period known as the Intermediate Horizon (Wallace 1955). Increased populations in the region necessitated the intensification of existing terrestrial and marine resources. The Intermediate Horizon marks a period in which specialization in labor emerged, trading networks became increasingly important means by which both utilitarian and non-utilitarian materials were acquired, and travel routes were extended.

The Late Prehistoric period, spanning from approximately 1,500 years before present to the mission era, is the period during which the contemporary Native American group known as the Gabrielino flourished (Wallace 1955). Occupying the southern Channel Islands and adjacent mainland areas of Los Angeles and Orange counties, the Gabrielino are reported to have been second only to their Chumash neighbors in terms of population size, regional influence, and degree of sedentism (Bean and Smith 1978). The Gabrielino are estimated to have numbered around 5,000 in the pre-contact period (Kroeber 1925), and maps produced by early explorers indicate that at least 26 Gabrielino villages were within close proximity to the Los Angeles River, while an additional 18 villages were within reasonably close proximity to the river (Gumprecht 1999). Subsistence consisted of hunting, fishing, and gathering. The primary plant resources were the acorn, gathered in the fall and processed in mortars and pestles, and various seeds that were harvested in late spring and summer and ground with manos and metates. The seeds included chia and other sages, various grasses, and islay or holly leafed-cherry (Reid 1939 [1852]).

3.4.2 History of the Project Area

The Gabrielino were virtually ignored between the time of Juan Rodriguez Cabrillo's visit to coastal southern California in 1542 and the Spanish Period, which began in 1769 when Gaspar de Portola and a small Spanish contingent began their exploratory journey along the California coast from San Diego to Monterey. Gabrielino villages are reported to have been most abundant in the San Fernando Valley, located north of the project site, the Glendale Narrows area north of downtown, and around the Los Angeles River's coastal outlets (Gumprecht 1999).

At least 10 Gabrielino villages were located in the San Fernando Valley, most situated in the foothill/prairie transition zone around the borders of the valley (McCawley 1996).

Missions were established in the years that followed the Portola expedition. On September 4, 1781, the El Pueblo de la Reina de los Angeles was established near present day downtown Los Angeles. By 1786, the flourishing pueblo attained self-sufficiency, and funding by the Spanish government ceased (Gumprecht 1999). When the Southern Pacific Railroad extended its line from San Francisco to Los Angeles in 1876, newcomers poured into Los Angeles, and the population nearly doubled between 1870 and 1880. More settlers continued to head west, and the demand for real estate skyrocketed. As real estate prices soared, land that had been farmed for decades outlived its agricultural value and was sold to become residential communities. The subdivision of the large ranchos took place during this time. The City's population rose from 11,000 in 1880 to 50,000 by 1890 (Meyer 1981:45).

As a result of growing population and the increasing diversion of water, the once plentiful water supply provided by the Los Angeles River began to dwindle. The once extensive floodplain dried up, the landscape had been cleared for construction materials and fuel, and the tens of thousands of head of cattle, horses, and sheep owned by ranchers had decimated the local grasses (Gumprecht 1999). A number of waterworks projects were underway during the second half of the 19th century in an effort to increase water flow and water retention.

History of Project Site

Upper Stone Reservoir is located in a portion of the Santa Monica Mountains that was previously part of the Rancho San Vicente y Santa Monica, a 30,260-acre land grant given to Francisco Sepulveda in 1828 (Scott 2004). A historic topographic quadrangle dating to 1902 shows no development in the project vicinity at that time (U.S. Army Corps of Engineers 1902). However, as part of on-going city-wide water storage improvements in the early part of the 20th century, a dam and reservoir were built in Stone Canyon. Construction of the original Stone Canyon Dam and its resulting reservoir (present day Lower Stone Canyon Reservoir) began in August 1920. Lower Stone Reservoir was placed into service in 1921 and provided much-needed water required for development on Los Angeles' west side (Los Angeles Times 1922).

Although Lower Stone Reservoir provided storage for approximately 3.4 billion gallons of drinking water, by the end of World War II, development in the area necessitated an increase in service capacity in various areas of Los Angeles. Additional water needs during the 1950s set into motion plans for construction of a reservoir to the north of Lower Stone Reservoir (Crofts 1954). The new reservoir would be known as Upper Stone Canyon Reservoir and would be constructed in part to provide increased water-pressure to the communities of Brentwood and Pacific Palisades (Los Angeles Public Library LADWP Photo Collection 1004919).

The construction of the $2.6 million Upper Stone Reservoir, then referred to as "Project 371," began with the Chief Engineer's Authorization dated September 10, 1951. The first phase of construction began December 6, 1951, and included building a bypass line around Upper Stone Reservoir to supply water to the area usually served by the original dam and excavation for tunnel No. 1 (Hayward 1956). Phase 2 of construction began in October 1952. This phase included the excavation of the main canyon; reservoir side cut excavation below the crest road; excavation of the slough material; placing the rolled fills for the north dam, main dam, and reservoir bottom; and completing the side canyon fills. Excavation for the outlet tower base began in May 1953. The outlet tower bridge abutment construction commenced in October

1953. Upper Stone Reservoir was placed into service on January 27, 1954 (Crofts 1954). Table 3.4-1 shows the dates associated with key Upper Stone Reservoir construction activities.

3.4.3 Existing Conditions

Records Search

Archival research for the proposed project was conducted on July 9, 2008, at the South Central Coastal Information Center housed at California State University, Fullerton. The research focused on the identification of previously recorded cultural resources within a 1-mile radius of the project site. The archival research involved review of archaeological site records, historic maps and historic sites, and building inventories. Additional research to develop a historical context for Upper Stone Reservoir was conducted at a number of archival repositories and local agency archives. Archives searched include the Los Angeles Public Library; the City of Los Angeles Bureau of Engineering Vault; and plans, photos, and historical narratives provided by LADWP.

The records search revealed that a total of 22 cultural resource investigations were previously conducted within a 1-mile radius of the project site (see Table 3.4-1). The previous investigations included record search studies and the preparation of survey and assessment reports. Four of the 22 previous investigations included portions of the project site and one of the 22 previous investigations covered the project site.

Table 3.4-1 Previous Surveys Conducted within 1-mile of Project Site

Author	Report (LA-)	Description	Date
Bissell, Ronald M.	2888*	Cultural Resources Reconnaissance for Improvements to Stone Canyon Reservoir Access Road, Los Angeles County, CA	1993
Bonner, Wayne H.	7780	Records Search Results and Site Visit for Cingular Telecommunications Facility LA-706-02 (405 Freeway & Mulholland Dr), 15459-1/2 Mulholland Drive, Los Angeles, Los Angeles County, California	2003
Bonner, Wayne H.	7808	Records Search and Site Visit Results for Sprint Telecommunications Facility Candidate LA34XC744A (Pole #20435SPR), 14480-1/2 Mulholland Drive, Los Angeles, Los Angeles County, California	2003
Brechbiel, Brant A.	4161	Cultural Resources Records Search and Literature Review Report for a Pacific Bell Mobile Services Telecommunications Facility: LA 459-01 in the City of Sherman Oaks, California	1998
Brown, Joan C.	2099*	Cultural Resources Reconnaissance of Nine Reservoirs for the City of Los Angeles, Los Angeles County, California	1990
Christy, Juliet L.	6129	Survey of Archaeological Resources Along Benedict Canyon Drive Between Mulholland and Hutton, Los Angeles, California	2001
Clewlow, William C. Jr.	1034	Archaeological and Paleontological Resource Assessment of Tentative Tract 41784, Bel Air Crest Estates, City of Los Angeles, Los Angeles County	1981

Author	Report (LA-)	Description	Date
Colby, Susan M.	1450	An Archaeological Resource Survey and Impact Assessment of a Vacant Parcel on the Northeast Corner of Beverly Glen Blvd., Between Tiffany and Beverly Glen Circle, City of Los Angeles	1985
Davis, Lois M.	857	An Archaeological Investigation of Briarwood Park in the Beverly Glen area, Los Angeles County	1980
Dillon, Brian D.	930	An Archaeological Resource Survey and Impact Assessment of Lot 1, Tract No. 14524, at 14545 Mulholland Drive, City of Los Angeles, California	1981
Dillon, Brian D.	949	An Archaeological Resource Survey and Impact Assessment of Three Telecommunications Tower Sites for the Southern California Rapid Transit District In Los Angeles County, California	1981
Dillon, Brian D.	3733*	Archaeological Survey of the Stone Canyon Vegetation Management Plan (Prescribed Burn) Los Angeles County, California	1977
Duke, Curt	6128	Cultural Resource Assessment Cingular Wireless Facility No. SM 014-01 Los Angeles County, California	2001
Feldman, J., Hope, A.	7430	Caltrans Historic Bridges Inventory Update: Concrete Box Girder Bridges	2004
Hector, Susan M.	428	An Archaeological Resource Survey and Impact Assessment of Tract No. 32026, Los Angeles County	1978
Lapin, Philippe	5602	Cultural Resource Assessment for Pacific Bell Wireless Facility LA 706-02, County of Los Angeles, California	2000
Maxon, Patrick O.	4736*	Prehistoric Cultural Resources Reconnaissance for the Stone Canyon Water Quality Improvement Project, Los Angeles, California	1999
McKenna, Jeanette A.	6526*	Cultural Resource Assessment/Evaluation for Nextel Communications Site CA-6826, 1630 Stone Canyon Road, Los Angeles, Los Angeles County, California	2002
Russell, Glenn S.	574	An Archaeological Resource Survey and Impact Assessment of A Division of Lot 10, Tract 12395, City of Los Angeles, Los Angeles, California	1979
Singer, Clay A.	1195	Cultural Resource Survey and Impact Assessment for Tentative Tract No. 23377 in the Sherman Oaks Area of the San Fernando Valley, Los Angeles County	1982
Wallock, Nicole	4849	Cultural Resource Assessment Cingular Wireless Facility No. VY 021-01, Los Angeles County, California	2001
Wlodarski, Robert J.	1010	An Evaluation of the Impact Upon Cultural Resources by the Proposed Development of 200 Acres Near the Intersection of Beverly Glen Boulevard and Mulholland Drive, Santa Monica	1981

* Indicates study overlapping with project site.

The records search indicated that one historic isolated artifact was previously recorded within the 1-mile radius area (see Table 3.4-2). No cultural resources have been previously recorded within the project site itself.

Table 3.4-2 Previously Recorded Cultural Resource Site within 1-mile of Project Site

P-Number (P-19-)	Description	Date Recorded
100029	Isolated sun colored amethyst shard of glass	6/16/1993

Sacred Lands File Search

A letter requesting a Sacred Lands File search was sent to the Native American Heritage Commission on July 21, 2008. The response from the Native American Heritage Commission dated July 25, 2008, indicated that the Sacred Lands File search results were negative for previously-documented sacred lands in the vicinity of the project site. The letter suggests, however, that the Native American Heritage Commission is not in possession of a comprehensive list of all sacred lands and that therefore the results of the search should not be considered exhaustive.

3.4.5 Cultural Resources Survey

Cultural resources field surveys of the project site were originally conducted on September 11, 2008. Due to refinements in the project concept plan, a second field survey was conducted on January 30, 2009. The surveys encompassed the maximum area of disturbance for the proposed project. The cultural resources surveys included all archaeological investigations and the documentation of historic architectural resources.

Archaeological Survey

The archaeological survey was carried out with surveyors walking in transects spaced at intervals of approximately 10 to 20 meters apart. Ground visibility was approximately 25 percent in most of the project site, with the exception of an area of greater ground visibility (approximately 90 percent) to the east of Upper Stone Reservoir. Soils throughout project site are light grayish brown sandy silts. No surface evidence of archaeological resources was encountered as a result of the archaeological resources component of the field survey.

Historic Architectural Resources Survey

As part of the cultural resources field investigation, historic-era built environment features were surveyed and documented. All of the historic-era features encountered during the survey are related to Upper Stone Reservoir.

The historic-era resource identified as Upper Stone Reservoir consists of the reservoir, outlet tower, footbridge, storm channel, pumping mechanisms, perimeter roadway, chain link fence, spring channels, abandoned drainage pipes, and a spillway channel. The upper reservoir itself is an uncovered, above-ground, compacted earth-fill structure approximately 1,600 feet in length and 600 feet in width, at its maximum. It has a maximum depth of 49 feet, a high water elevation of 930 feet, and a surface area of approximately 14 acres at the high water elevation. The bottom and sides of the reservoir are paved with asphaltic concrete. The outlet tower is constructed of reinforced concrete and measures approximately 82-feet high from the bottom of the base to the top of the parapet wall. The outlet tower is accessed by a plate girder footbridge. A curvilinear concrete storm (drainage) channel with earthen embankments is located at the northern end of the upper reservoir. Pumping mechanisms are attached to a concrete pad also near the northern end of the reservoir. An approximately 18-foot wide perimeter roadway circles the reservoir. A chain link fence encloses the entire structure. Concrete-lined spring channels with concrete block wall abutments are located adjacent to Upper Stone Reservoir. A number of dilapidated abandoned stand pipes (drainage pipes) were noted lying amongst vegetation east of the reservoir. The stand pipes are constructed of metal featuring vertical linear perforations and convex triangular caps. A spillway channel described as a rectangular reinforced concrete flume several hundred feet long and approximately 10 feet wide is also located on the east side of the reservoir.

Paleontological Records Search

A paleontological records search was conducted at the Natural History Museum of Los Angeles County Departments of Vertebrate and Invertebrate Paleontology and in existing literature. No vertebrate locality is known to be located within a 1-mile radius of the project site (Los Angeles County Museum Department of Invertebrate Paleontology 2008).

3.4.6 Regulatory Setting

National Historic Preservation Act

Enacted in 1966, the National Historic Preservation Act established the National Register of Historic Places (National Register) program under the Secretary of the Interior, authorized funding for state programs with provisions for pass-through funding and participation by local governments, created the Advisory Council on Historic Preservation, and provided for a review process for protecting cultural resources. The National Historic Preservation Act provides the legal framework for most state and local preservation laws.

The National Register program is maintained by the Keeper of the Register, within the National Park Service division. The National Register program also includes National Historic Landmarks, which are limited only to properties of significance to the nation. A building, district, site, structure, or object is eligible for listing in the National Register if it possesses integrity of location, design, setting, materials, workmanship, feeling, and association and meets at least one of the following criteria:

A. It is associated with events that have made a significant contribution to the broad patterns of our history;
B. It is associated with the lives of persons significant in our past;
C. It embodies the distinctive characteristics of a type, period, or method of construction or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components may lack individual distinction; or
D. It has yielded, or may be likely to yield, information important in prehistory or history.

Resources that are eligible for listing on the National Register are automatically eligible for listing on the California Register of Historic Places (California Register).

California Register of Historic Places

A cultural resource is considered “historically significant” under CEQA if the resource meets one or more of the criteria for listing on the California Register, which is an adaptation of the National Historic Preservation Act criteria. The California Register was designed to be used by state and local agencies, private groups, and citizens to identify existing cultural resources within the state and to indicate which of those resources should be protected, to the extent prudent and feasible, from substantial adverse change. The following criteria have been established for the California Register (Pub. Res. Code Section 5024.1, Title 14 CCR, Section 4852). A resource is considered significant under CEQA if it:

1. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
2. Is associated with the lives of persons important in our past;
3. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; and/or
4. Has yielded, or may be likely to yield, information important in prehistory or history.

In addition to meeting one or more of the above criteria, historic resources eligible for listing in the California Register must retain enough of their historic character or appearance to be able to convey the reasons for their significance. Such integrity is evaluated with regard to the retention of location, design, setting, materials, workmanship, feeling, and association.

3.4.7 Environmental Impacts

Thresholds of Significance

As part of the Initial Study (see Appendix A), it was determined that the proposed project would not disturb any human remains, including those interred outside of formal cemeteries. Accordingly, this issue is not further analyzed in the EIR.

The CEQA Guidelines establish that a proposed project would have a significant effect on cultural resources if it would:

- Cause a substantial adverse change in the significance of a historical resource (Cal. Code Regs., Title 14, Section 15064.5);

- Cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines Section 15064.5; or

- Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.

Impact Analysis

CR-1 *The proposed project would not cause a substantial adverse change in the significance of a historical resource.*

Upper Stone Reservoir was evaluated for its eligibility in the California Register and therefore the National Register. Upper Stone Reservoir was originally constructed between 1951 and 1953. Between 1956 and 1957, the main storm channel was reconstructed. No major alterations have been made since the 1950s, and Upper Stone Reservoir continues to function as originally intended, providing water storage and service for downstream neighborhoods.

In order to determine the potential eligibility of the Upper Stone Reservoir, as part of this study, a cultural resources survey of the project area and an archival research were conducted. This information included, but was not necessarily limited to:

- Construction plans for Upper Stone Reservoir, on file at LADWP, Los Angeles, California
- Field Engineer Notes – Upper Stone Reservoir, on file at LADWP, Los Angeles, California
- Sanborn Fire Insurance Maps, available online
- Historical photographs of the SCRC, on file at LADWP, Los Angeles, California
- Historic topographic maps, various dates, available online
- Various secondary sources on Los Angeles water history, on file at the Los Angeles Public Library

For a water system to be considered eligible under Criterion 1 of the California Register, it must be found to be associated with specific important events or patterns of events. The significance of the documented association must be an important association in and of itself, not mere coexistence. Research has shown that the Los Angeles area has had a long history in water storage/water-related projects. By the early to mid decades of the 20th century, several reservoirs and associated features (e.g., dams, etc.) had been constructed and were in use throughout the Los Angeles area. Upper Stone Reservoir is but one of many such structures built during the mid-20th century. Research did not indicate that Upper Stone Reservoir was significantly associated with events considered important in local or state-wide history. This structure does not meet the eligibility criteria for listing on the California Register under Criterion 1.

For eligibility under Criterion 2, a property must be associated with an important person's productive life and must be a property that is closely associated with that person. Water-related systems are rarely found eligible under Criterion 2; however, a water system could be found eligible under this criterion if an important person's association with the system is strong and no other properties closely associated with that person remain. Upper Stone Reservoir is not known to be associated with individuals considered important in local or state-wide history. Upper Stone Reservoir was designed and constructed by the Field Engineering Division. Research did not indicate association of Upper Stone Reservoir to noted engineers or architects. This structure, therefore, is not eligible for California Register listing under Criterion 2.

Water-related systems can be determined eligible for the California Register under Criterion 3 for their engineering or design values. Properties eligible under this criterion may have unique features, or they may be good examples of a particular type of property. Although Upper Stone Reservoir maintains relatively good integrity (the only known modifications consist of the main storm channel reconstruction in 1956–57 and new chlorination station), it is an example of a common reservoir type (earth-fill) and does not represent unique or intrepid designs. Most of the reservoirs built contemporaneously, as well as earlier structures, utilized this type of construction. Upper Stone Reservoir is not eligible for listing on the California Register for architectural distinction or as the work of a master.

Eligibility under Criterion 4 hinges on the ability of the property, as contained in artifacts and objects, to further address issues of scientific importance to the period of significance. These data are primarily derived from archaeological sites and rarely buildings and structures themselves. Archaeological features or deposits may provide new information not available elsewhere regarding the kinds of documented or undocumented activities in the area. While buildings and structures can sometimes provide important information regarding historic construction techniques, these techniques may also be well documented in both written and visual sources, and the building or structure itself may not yield new primary information. Information on the construction and history of Upper Stone Reservoir has been documented in several sources; therefore, the structure does not possess the potential to answer important scientific questions or yield previously unknown information. The resource's research value has been realized. This structure, therefore, is not eligible for listing under California Register Criterion 4.

No other historic-era features were identified within the project site. As discussed above, Upper Stone Reservoir would not be eligible for listing under the California Register. In addition, it does not meet the criteria for listing on the National Register. Because Upper Stone Reservoir is not eligible for listing under the California Register or the National Register, removal of Upper Stone Reservoir would result in a less than significant impact to historic resources.

CR-2 *The proposed project could cause a substantial adverse change in the significance of an archaeological resource.*

Although no surface evidence of archaeological resources was encountered during the cultural resources survey, it is possible that subsurface archaeological materials may be encountered during ground-disturbing activities associated with the proposed project. In the event that archaeological materials are encountered during ground disturbing activities, the construction contractor would be required to cease activity in the affected area until the discovery can be evaluated by a qualified cultural resources specialist (archaeologist) in accordance with the provisions of CEQA Guidelines Section 15064.5. To ensure that the construction contractor and crew would be able to recognize archaeological materials, implementation of mitigation measure CR-A is required.

CR-3 *The proposed project would not directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.*

Paleontological resources are considered to be significant if they provide new data on fossil animals, distribution, evolution, or other scientifically important information. According to the paleontological records, there are no known fossil resources within a 1-mile radius of the project site. Surface grading or very shallow excavations in the project site are unlikely to encounter significant fossil vertebrate remains. However, deeper excavations may uncover significant vertebrate fossils. In the event any paleontological resources are encountered during earthmoving activities, the construction contractor would cease activity in the affected area until the discovery can be evaluated by a qualified paleontological resource specialist in accordance with the previsions of CEQA Guidelines Section 15064.5. Compliance with existing regulations would ensure a less than significant impact.

3.4.4 Mitigation Measures

CR-A Prior to the start of construction, LADWP shall hire a qualified archaeologist to conduct a construction worker briefing. The briefing shall focus on the types of resources that may be encountered during ground disturbing activities. Archaeological materials may manifest in the form of either prehistoric or historic artifacts. Construction workers shall be briefed on the requirements of CEQA

Guidelines Section 15064.5 in the event that resources are encountered during ground disturbing activities. LADWP shall retain a qualified archaeological consultant prior to the start of construction to respond on an as-needed basis in the event that discoveries occur.

3.4.5 Significance After Mitigation

Impacts to archaeological resources would be reduced to a less than significant level with implementation of mitigation measure CR-A.

Impacts to historic and paleontological resources would be less than significant without implementation of mitigation.

CHAPTER 3.5
WILDLAND FIRE

This chapter presents an analysis of the potential for an increased risk of wildland fire (or as termed in this chapter, wildfire) occurring in Stone Canyon relative to the provision of public access to the SCRC in the form of limited trails use, as is proposed as a component of the buried reservoir project. The existing environment in and around the SCRC in relation to the level of wildfire hazard (i.e., the factors that influence the potential severity of wildfires) and wildfire risk (i.e., the probability of an actual wildfire event) define the baseline conditions for this analysis. While it is difficult to quantify in absolute terms a level of increased risk of wildfire associated with the trails use component of the proposed project, the potential impact related to public access at the SCRC can nonetheless be generally evaluated, especially in the context of the history of and the potential for catastrophic wildfire events in the Santa Monica Mountains in general and the Stone Canyon area in particular.

3.5.1 Environmental Setting

Existing Wildfire Hazard

The existing wildfire hazard in Stone Canyon and the surrounding area describes the conditions that contribute to the potential severity of a wildfire in terms of characteristics such as intensity, rate of spread, areal extent, ecological harm, and human costs related to property damage, injuries, and loss of life. Wildfire hazard is independent of the probability of the actual incidence of fire (i.e., an ignition event), which is addressed in *Existing Wildfire Risk*, below. Conditions that contribute to the existing level of wildfire hazard in the Stone Canyon area include fuel, topography, climate and weather, land use, and wildfire hazard management practices. As discussed in greater detail below, based on these factors as they currently exist in Stone Canyon, the City of Los Angeles has designated the canyon and the surrounding neighborhoods as a Very High Fire Hazard Severity (VHFHS) Zone.

Fuel

Fuel is one of the three primary components necessary for a fire to occur. In a wildfire environment, the primary fuel is vegetation. In terms of vegetative composition, Stone Canyon typifies much of the Santa Monica Mountains, which are often characterized as a fire ecology. However, while many individual plant species and plant communities in the Santa Monica Mountains are fire-adapted (i.e., they have evolved to possess mechanisms to more readily recover from recurring fire), they are not actually fire-dependent (i.e., they will thrive and have thrived in the past for long periods of up to several hundreds of years without fire).

The predominant plant communities in Stone Canyon include chaparral and coastal sage scrub, which share some common species and are often intermixed at their margins. Plant species found in both communities have developed mechanisms that allow them to recover from fires either as individuals or through offspring. These mechanisms include re-sprouting from the crown located at the junction of the root and shoot portions of the plant or growing anew from previously dormant seeds that germinate only after the hard seed coat is made permeable by heating from a fire. Through these means, chaparral and coastal sage scrub communities have successfully regenerated for millennia despite recurring major fire events.

Given the climatic setting in arid Southern California, chaparral and coastal sage scrub plant species have also evolved to be drought tolerant. Drought adaptations may include mechanisms to limit water loss from transpiration, such as small and/or leathery leaves or deciduousness (leaf loss) during hot, dry periods. Many of the plants in these communities are also characterized by dense and tangled branching structures that extend down to ground level, thereby crowding out understory vegetation that may compete for water. In addition, plants in these communities often grow in tightly-grouped patterns that form dense thickets, especially in chaparral, further crowding out understory growth. However, this interlaced network of relatively small leaves and thin branches also creates a comparatively high ratio of surface area to volume, providing greater fuel exposure to oxygen and heat (the other two necessary components of fire) relative to mass when compared to plants with larger leaves and thicker, less tangled branching structures.

Stone Canyon also includes isolated stands of oak walnut woodland plant community, located primarily on more shaded north-facing slopes. This community is also fire-adapted, employing mechanisms such as crown and branch re-sprouting and, in the case of oaks, a protective layer of thick, hardened bark. Oak walnut woodland sometimes grows in association with an understory of chaparral or coastal sage scrub species.

Under appropriate environmental conditions, such as low relative humidity, high temperature, and seasonal dry periods, the drought-tolerant characteristics of individual plants and the growth pattern of groupings of plants in these communities (along with a layer of branch and leaf litter on the ground) makes them prone to readily catch fire and burn rapidly and intensely if exposed to an ignition source.

Some areas in Stone Canyon also contain ruderal plant species (i.e., nonnative, sometimes invasive vegetation) that have displaced native plant communities where disturbance has occurred. These include nonnative grasses, stands of black mustard (*Brassica nigra*), and other herbaceous species. These ruderal species are often annuals that dry up in the summer and fall seasons, when the conditions for wildfire are most acute. They provide less fuel load than the chaparral or coastal sage scrub vegetation in the canyon, but in this dry state, they nonetheless can burn intensely and very rapidly.

In addition to the various vegetation types that provide potential fuel for wildfire in Stone Canyon, so-called urban fuels associated with the human development that almost entirely surrounds the canyon also contribute to the level of wildfire hazard. These fuels include not only residences themselves but outbuildings, decks, furniture, fencing, ornamental landscaping, and other combustible materials.

Topography

Topography plays a key role in wildfire by influencing the pattern and speed at which a wildfire spreads; the firefighters' ability to readily and safely attack a fire; the type of vegetative fuel available; and the amount of solar insolation, which in turn affects the moisture content of vegetation.

Like much of the Santa Monica Mountains, Stone Canyon consists of relatively steep and rugged terrain. It is a generally north-south trending canyon that contains numerous east-west as well as north-south trending ridges that descend to the base of the canyon. The side slopes of many of these ridges exceed 50 percent gradient as the elevation in the canyon climbs approximately 500 feet from Lower Stone Reservoir to the crest of the perimeter ridgelines. Degree of slope is a major factor related to the existing wildfire environment of Stone Canyon since fire naturally moves uphill because heat rises, first drying then igniting up-slope vegetation in its path. A fire generally moves faster the steeper the slope on which it occurs because vegetative fuel is more exposed to the upward path of the fire's heat, especially if the fire is wind driven. Fire can move many times faster uphill than it does on flatter ground. Conversely, fire moves less readily downhill because down-slope vegetation is less exposed to the rising heat of the fire, and a fire may stall or slow in its advance at the crest of a ridgeline. This stalling phenomenon could occur on any of the intermittent ridgelines within Stone Canyon, but since the ridgelines that define the canyon's western, northern, and eastern perimeters naturally establish the highest elevations in the canyon, fire would tend to continue to move upwards towards theses ridges, depending on such factors as the site of ignition and wind speed and direction.

Flame lengths can increase substantially in an uphill burn because of the increased fuel involved. Even in relatively low-wind conditions, flame lengths in chaparral and coastal sage scrub environments can reach 30 feet on steep slopes. At high wind speeds, which occur annually in Southern California, flames can increase to several times this length (County of Los Angeles Fire Department 2010). This increased flame length also increases the convection currents naturally created by the heat from the fire. These currents in turn carry aloft firebrands (hot embers from combusted vegetation), which also can increase in number due to the greater volume of fuel consumed in an uphill burn compared to a fire on flatter terrain.

The rugged and steep terrain in Stone Canyon not only hinders access for firefighting equipment and personnel, it also presents perhaps the most unpredictable and dangerous situation facing firefighters during a wildfire. Firefighters cannot work in areas where the intensity of the flames (i.e., the heat emitted by the combustion of fuel) is too great, as often happens in fires on steep terrain. Furthermore, firefighters will not intentionally place themselves in a life-threatening position if there is little chance to successfully control a fire. The rapid rate of a fire's spread, the erratic nature of winds, dense vegetation, increased flame lengths, and limited opportunities for escape that characterize wildfire situations in steep terrain contribute to the challenge and danger of fighting fires in Stone Canyon.

Many types of vegetation cannot establish or thrive on steep slopes. However, chaparral and coastal sage scrub have adapted to grow on steep slopes with shallow or rocky soils. This adaptation has allowed these plant communities to become the dominant vegetation type throughout the undisturbed areas of the Santa Monica Mountains, including Stone Canyon. As discussed above, due to their growth habits and drought-tolerance mechanisms, these plants are particularly prone to ignite and burn intensely if exposed to a sufficient heat source.

Slope aspect (i.e., the compass direction a slope faces) strongly influences the type and condition of vegetation that grows on a slope related to the relative exposure to or protection from solar radiation. In general, south- and west-facing slopes experience greater heating from solar radiation because of the ground surface's orientation in relation to the sun's rays and the length of exposure to the sun during the hottest portions of the day. This effect on the distribution of the type of vegetation in Stone Canyon is seen in the fact that oak-walnut woodland, which is less heat tolerant than coastal sage scrub or chaparral, is concentrated mainly on north-facing slopes or in the lower reaches of canyons, where it receives more shade. Chaparral and coastal sage scrub predominate on the west- and south-facing slopes in Stone

Canyon; however, even within these plant communities, the variety of species may be more limited on west- and south-facing slopes. Relative to wildfire hazard, plants located on slopes with southerly or westerly aspects may contain considerably less moisture content due to their exposure to the sun, increasing the potential for higher intensity fires with faster rates of spread.

Climate and Weather

Wind, relative humidity, and temperature are the dominant factors that contribute to the severity of the wildfire hazard in Stone Canyon. Stone Canyon is located within the coastal region of Southern California, which is characterized by a Mediterranean climate regime. This climate, which reflects the long-term weather patterns of the region, is a principal influence creating many of the conditions that define the fire hazard in Stone Canyon. It is typified by hot, dry summers and mild, wet winters. The type and characteristics of vegetation in Stone Canyon (which, as discussed above, is the primary fuel source for wildfire in the canyon) is a reflection of an adaptation to, among other factors, the Mediterranean climate. This adaptation has resulted in plants that are capable of surviving with low moisture content for extended periods and that grow in dense arrangements, both characteristics that increase susceptibility to ignition and intense burning.

Reflecting the Mediterranean climate, about 85 percent on average of the rainfall in the Santa Monica Mountains occurs in the 5-month period from November through March, with nearly half occurring in January and February. Except for April (when slightly over 1 inch average of rainfall occurs), during the remaining months of the year, less than 1 inch average of rainfall occurs each month, with virtually no precipitation during June, July, or August (National Park Service 2005). This leads to a typical cycle for the plants in Stone Canyon of a period of growth during the wet winter months, followed by a prolonged dry period, during which the plants' internal moisture is steadily depleted.

The moisture content of plants is a primary factor relative to wildfire hazard potential. Moisture stored within a plant absorbs heat through evaporation, which reduces the heat available for combustion. Fuel moisture is measured as a ratio of the weight of the moisture in a plant over its dry weight. Live fuel moisture (i.e., the measure of moisture in a living plant) of 60 percent is considered a critical level at which combustion is no longer inhibited by dissipation of heat through evaporation and below which plant material becomes more susceptible to ignition. At this level of moisture, the behavior of live fuels is essentially the same as that of dead fuels. Depending on the amount and timing of winter-season rains, this critical level may be reached in the Santa Monica Mountains, including Stone Canyon, by late summer or early fall (National Park Service 2005). This low-moisture condition may also be exacerbated by prolonged droughts, which commonly occur in the Southern California region.

After the extended dry period following the winter rains, weather, which is the short-term reflection of various meteorological conditions that contribute to a particular climate, plays a crucial role in terms of more immediate fire danger and the potential severity of fires within Stone Canyon and the Santa Monica Mountains in general. This is particularly true in the late summer and early fall, when daily temperatures can be elevated and relative humidity can be low. These conditions are intensified by dry, warm northeasterly Santa Ana winds, which occur primarily from September to December. Santa Ana winds can have sustained speeds of 40 mph and can gust at between 50 and 100 mph. Given its shape and north-south orientation, Stone Canyon tends to funnel these winds to the south and southwest. The Santa Ana winds not only contribute to a further reduction in fuel moisture but, assuming a fire has been ignited, also fan the fire, increasing its intensity and its spread at often uncontrollable rates.

A major aspect of wind driven fires is the creation and transport of firebrands. Because of the characteristics of the primary vegetative fuel involved in wildfires in the Santa Monica Mountains, these burning embers are readily created and carried aloft in the fire's convection currents. Since fuel is consumed at a greater rate in a wind-whipped fire, more firebrands are created. Thousands of the hot embers are carried aloft and transported by the wind to new locations where additional spot fires may begin. This is not only a concern in relation to properties adjacent to or near the fire, but also for areas more removed from the original blaze, depending on the intensity of the winds. This phenomenon is one of the most consequential characteristics of wildfires in the Santa Monica Mountains because it accounts for their unpredictable nature and uncontrolled spread, including over seemingly wide natural and manmade barriers, such as firebreaks and even freeways.

The overwhelming impact of Santa Ana winds on fire severity is borne out by the history of fires in the Santa Monica Mountains. Between 1925 and 2000, fully 50 percent of all the acreage consumed by wildfires in the mountains occurred during the month of October, when the end of the annual dry period coincides with the Santa Ana wind season. Nearly all the acreage (95 percent) consumed by wildfires in the Santa Monica Mountains during this 75-year period occurred from September through December, which coincides with the main Santa Ana wind season. This is true even though the number of fires from 1925 to 2000 in terms of actual ignition events was highest during the mid-summer period, preceding the Santa Ana winds (National Park Service 2005). Santa Ana winds gusting in excess of 50 mph were also the primary factor contributing to the severity of the November 1961 Bel Air-Brentwood Fire that consumed Stone Canyon and surrounding areas.

However, not all major fire incidents in the Santa Monica Mountains are related to Santa Ana wind events. Prevailing southwesterly onshore winds, which blow northward through Stone Canyon, may also occur during the summer dry season and, assuming a fire was ignited, could contribute to the fire's intensity and spread.

Land Use

Throughout the Santa Monica Mountains, urban and residential development is located within or abuts undeveloped natural areas, creating the so-called wildland-urban interface, also known as the WUI. In many respects, Stone Canyon is a microcosm of the WUI land use relationship. With the exception of the existing reservoirs and the relatively few facilities that provide support for drinking water storage and treatment functions, the portion of the canyon located north of the Lower Stone Reservoir dam (i.e., essentially the SCRC) is basically undeveloped and representative of the native plant communities in the Santa Monica Mountains. This portion of the canyon is, however, almost entirely encircled by residential development located along the perimeter ridgelines to the west, north, and east, as well as in the lower reaches of Stone Canyon to the south of the SCRC.

As discussed above, these developed areas adjacent to Stone Canyon can, depending on the materials, provide a source of fuel for wildfires in addition to the vegetative fuel located in the canyon itself. However, as well as potentially providing fuel, this interface of development and natural land also contributes to the hazard related to wildfire because it establishes a situation where a threat is posed to people and property, rather than to only undeveloped areas that, in any event, would be subject to periodic cycles of burning and recovery under the natural fire regime of the Santa Monica Mountains.

The pattern of the development of the predominantly residential neighborhoods surrounding Stone Canyon also contributes to the level of hazard because it affects both egress and access during a large-scale emergency event. Primarily respecting the natural terrain of the mountains, the streets surrounding Stone Canyon are comparatively narrow and circuitous, with relatively lengthy segments lacking alternative route choices. This street system includes numerous cul-de-sacs, including some dead end segments of over 0.5 miles in length. The configuration of the road network surrounding Stone Canyon may considerably hamper both the emergency evacuation of residents and access for firefighters and other emergency responders in the event of a large wildfire.

Wildfire Hazard Management

Based on the conditions described above and on the history of wildfires in California and the Los Angeles region, the City of Los Angeles Fire Department (LAFD) has designated Stone Canyon, as well as most of the mountainous area within the City boundaries, as a VHFHS Zone. As a result of the 1991 Oakland Hills Fire, the State of California passed legislation in 1993 requiring local jurisdictions to designate such zones. This designation was a continuance of a long-standing program within the City to identify wildfire hazard areas as a result of the 1961 Bel Air-Brentwood Fire and the 1971 Chatsworth Fire. Utilizing criteria prepared by the California Department of Forestry and Fire Protection, including factors such as fuel, terrain, weather, and land development patterns, the LAFD established the current VHFHS Zone in 1999 to replace earlier hazard designations (Los Angeles Fire Department 2007).

In accordance with provisions established in the Los Angeles Municipal Code, one purpose of the VHFHS Zone designation is to ensure that certain measures are taken by property owners to help reduce the level of wildfire hazard, with the principal objective of protecting structures. These measures focus primarily on limiting potential wildfire fuel loads by creating a defensible perimeter in the area immediately surrounding structures (Los Angeles Fire Department 2007). Under LAFD guidelines, vegetation clearance must be accomplished in two concentric zones around all structures. Within 100 feet of a structure, a *Defensible Space* must be established that minimizes the amount of vegetative fuel and maintains minimum clearances between plant material and structures. This inner zone provides firefighters with a safer environment within which they can better protect the structure from fire. In the zone between 100 feet and 200 feet from a structure, a *Fuel Modification Area* must be established within which vegetation must be pruned up from the ground and dead material must be removed (Los Angeles Fire Department 2010). Fuel modification in shrubland ecosystems such as Stone Canyon over wider areas beyond the strategic defensible perimeter associated with the VHFHS Zone designation is not recommended because it is extremely difficult and prohibitively expensive to achieve; it can cause substantial or irreparable damage to the natural habitat in chaparral and coastal sage scrub plant communities; and, most importantly, it has proven to have had little influence on the frequency, severity, and extent of wildfires in the Santa Monica Mountains environment over the last century (ForEverGreen Forestry 2010a). The defensible perimeter vegetation clearance requirements in the Stone Canyon VHFHS Zone are administered, enforced, and/or implemented by the LAFD.

In addition to the clearance areas around structures, fire breaks within which all scrub vegetation has been removed are maintained by LADWP along the major ridgelines in the SCRC. This strategic approach to fuel reduction around structures and along ridgelines decreases but does not eliminate the high wildfire hazard in Stone Canyon because the remaining conditions that contribute to the hazard are largely uncontrollable. These conditions include topography, the existing WUI, climate, and especially weather, which, as discussed above, is the overriding factor influencing the intensity, speed, and spread of wildfires in the Santa Monica Mountains.

In addition to the establishment of a defensible perimeter through vegetation management as required under the Los Angeles Municipal Code, the 2007 California Building Code requires that all new construction in a VHFHS Zone utilizes materials and methods intended to resist the intrusion of fire, including by way of such building elements as roofs, eaves, vents, walls, windows and doors, and decks (California State Fire Marshal 2007). Most homes surrounding the canyon have improved immensely in this regard since the 1961 Bel Air-Brentwood Fire, particularly relative to the elimination as roofing material of wood shakes and shingles, which contributed to the rapid and uncontrolled spread of structure fires during the Bel Air-Brentwood blaze and which are now prohibited in the City of Los Angeles. However, although such “hardening” of buildings helps decrease the wildfire hazard in the Stone Canyon vicinity, the high level of hazard is not eliminated, partially because many homes surrounding the canyon predate the latest code requirements, but also due to the uncontrollable nature of the other factors that contribute to wildfire hazard.

The LAFD and the Los Angeles Department of Transportation (LADOT) have also instituted a Red Flag No Parking Program, which prohibits parking on certain streets surrounding Stone Canyon (and in many other mountainous areas of the City) on red flag warning days because of narrow passages that could hamper emergency operations, including evacuation and fire vehicle access. Red flag warning days occur during acute fire weather conditions, including winds in excess of 25 mph combined with a relative humidity of 15 percent or less (Los Angeles Fire Department 2010). While this parking prohibition lessens potential conflicts, the generally circuitous pattern of the road network surrounding the canyon, along with the relatively limited ingress and egress options, nonetheless still contributes to a high wildfire hazard in the Stone Canyon neighborhood.

Existing Wildfire Risk

Wildfire risk is considered independently from wildfire hazard. Risk is a description of the probability of a fire actually occurring (or, more precisely, an ignition that results in a fire), as opposed to an assessment of the potential severity of the fire, which is more correctly a function the wildfire hazard factors discussed above. Based on history, the annual occurrence of at least some wildfire events within the Santa Monica Mountains is relatively certain. However, it is not possible to accurately predict the occurrence of fire in a given year at a given location, such as Stone Canyon, because any single ignition event occurs essentially independently of the long-term historical trends over a broad area. But while precise predictions are impractical, the wildfire risk in Stone Canyon can nonetheless be generally characterized based on several factors, including the frequency of fires under the natural fire regime of the Santa Monica Mountains and during the past century; the causes of wildfires in the Santa Monica Mountains in recent decades; prediction models related to wildfire ignitions in the Santa Monica Mountains; and the history of fire in and around Stone Canyon itself.

Fire Frequency

The fire regime of an area is a description of the long-term pattern of wildfire in terms of frequency, intensity, size, etc., that would be prevalent under natural conditions (i.e., conditions largely uninfluenced by humans). Essentially the only natural cause of wildfire in the Santa Monica Mountains is a lighting strike. This is as true today as it has been for millions of years. Compared to many areas, the number of lightning strikes in coastal Southern California is relatively low. Furthermore, consistent with the Mediterranean climate of the region, most lightning in the mountains occurs during the winter rainy season, when temperatures and the number of Santa Ana wind days are lower and relative humidity (and thus vegetation fuel moisture) is higher. These conditions tend to discourage ignition by lightning and the spread of lightning-caused fires. Given the dominant influence of weather in relation to wildfires in the Santa Monica Mountains, lightning would generally need to coincide with the dryer and windier late summer and fall seasons to result in a fire of any consequence. Therefore, large wildfires in the Santa Monica Mountains were infrequent under the natural fire regime, occurring only once or twice per century (or less) in a given area (ForEverGreen Forestry 2010a). This is contrary to the commonly held belief that chaparral and coastal sage scrub have been naturally subject to frequently recurring fires and are dependent on such fires to maintain the health of the habitat (California Chaparral Institute n.d.).

The frequency of wildfires in the Southern California region began to increase with the advent of European settlement. Widespread clearing of brush using fire was a common practice during the 18th and 19th centuries to create rangeland for cattle grazing, especially in flatter areas (ForEverGreen Forestry 2010a). However, the frequency of wildfires increased markedly during the 20th century, coinciding with the real estate and economic boom originally fostered by the arrival of the railroad in the late 19th century, resulting in enormous population growth in the Los Angeles area and increased human interaction with the fire-prone natural environment that characterizes the region.

Accurate records, including maps, for fires in the Santa Monica Mountains have been kept since about 1925 (National Park Service 2010). In the past 85 years, there have been well in excess of 300 fires and 500,000 acres burned within the mountains. Because wildfire involves a complex set of variables, the actual number of recorded fires per year or decade has often fluctuated considerably between 1925 and 2000, but the long-term trend indicates a more than twofold increase in the number of fires annually over this period. In general, the number of large fires (those greater than 1,000 acres) has remained relatively consistent, never exceeding 10 in any 5-year increment. However, the number of small fires (those less than 1,000 acres) has increased over time. Although the total area affected by wildfire also has varied widely from year to year, there has nonetheless also been an upward trend indicating an approximate twofold increase in acreage burned annually over the period since 1925 (National Park Service 2005).

This marked increase in fire frequency over roughly the past century has substantially altered the fire regime of the Santa Monica Mountains. Unlike much of the forested areas of the West, where fire suppression strategies have altered the fire regime by lengthening the natural fire return interval (i.e., the elapsed time between fires), the opposite is true in the Santa Monica Mountains, where the fire return interval has been substantially shortened *in spite of* aggressive fire prevention efforts (ForEverGreen Forestry 2010a). Based on an analysis of data related to fire frequency since 1925, this shortened fire interval has increased the risk of wildfire (i.e., the probability of ignition) in the Stone Canyon area and at locations elsewhere in the Santa Monica Mountains from as little as once every 75 to 100 years under the natural fire regime to approximately every 30 years under current conditions (National Park Service 2005). While this return interval is not an absolute predictor of an ignition event at a given location, it is representative of the average level of wildfire frequency at locations across the mountains as a whole, including Stone Canyon.

Causes of Wildfire

Detailed records for the causes of wildfires in the Santa Monica Mountains are available for approximately the last 30 years (see Table 3.5-1). As is evident from these records, natural causes (i.e., lightning) account for a very small percentage of fires both in terms of the number of ignitions and the total acreage burned. A total of six lightning fires (3 percent of the total ignitions) occurred during this period; however, all occurred in clusters involving two single storm events in 1984 and 1998 (National Park Service 2005). The total area involved in lightning fires was slightly over 600 acres (0.5 percent of the total acreage burned during this period), but one of the six recorded lightning fires accounted for nearly all the acres burned, with the other five accounting for less than 1 acre each (National Park Service 2005). This pattern is consistent with what would be expected under the natural fire regime of the Santa Monica Mountains, and it verifies the essentially inconsequential role of lightning in the current wildfire environment of the mountains.

Table 3.5-1 Recorded Causes of Wildfire in the Santa Monica Mountains, 1982-2008

Cause	Number	% of Number	Acres	% of Acres
Arson	14	7.37%	78,118.6	67.37%
Electrical Distribution Line	16	8.42%	20,467.7	17.65%
Unknown	69	36.32%	6,377.9	5.50%
Warming Fire	1	0.53%	4,707.0	4.06%
Prescribed Burning	23	12.11%	4,122.7	3.56%
Smoking	6	3.16%	809.6	0.70%
Lightning	6	3.16%	602.5	0.52%
Fireworks	4	2.11%	281.1	0.24%
Playing With Matches	7	3.68%	148.1	0.13%
Cooking Fire	9	4.74%	69.6	0.06%
Land Clearing	4	2.11%	54.4	0.05%
Trash Burning	2	1.05%	54.3	0.05%
Burning Building	2	1.05%	51.2	0.04%
Burning Vehicle	15	7.89%	40.4	0.03%
Aircraft	2	1.05%	31.1	0.03%
Exhaust – Power Saw	5	2.63%	19.0	0.02%
Burning Dump	3	1.58%	0.4	0.00%
Exhaust – Other	1	0.53%	0.2	0.00%
Burning Brush Pile	1	0.53%	0.1	0.00%
Total	*190*	*100.00%*	*115,955.9*	*100.00%*

Source: ForEverGreen Forestry 2010a.

During this 3-decade period, all other wildfires for which a cause has been identified are attributable to human activity. Of the fires with known causes, the largest number (23 fires, or about 12 percent of the total ignitions) were intentionally set related to prescribed burning activities. However, since prescribed burns are conducted under extremely controlled conditions in relation to weather, fuel modification, and suppression capability, they generally do not contribute to an increased risk of wildfire. Ignitions attributable to the downing or arcing of electrical distribution lines during wind storms account for the second largest number of fires with a known cause (16) and the second largest amount of area burned (about 20,500 acres) from all fires of both known and unknown origin. However, fires related to electrical lines represent an indirect impact of human development associated with an inanimate object, and they do not generally contribute to an increased risk resulting directly from human activity. The cause of a substantial number of the fires during the 3-decade period (69 out of a total of 190 incidents) remains unknown, but, based on the very low likelihood of lightning-induced fire, all or nearly all the fires of unknown origin can also be attributed to human activities similar to those related to the fires of known origin.

An analysis directed at fires of known origin that eliminates ignitions associated with lightning (rarely occurring natural fires), prescribed burns (fires set intentionally under highly controlled conditions), and electrical lines (fires related indirectly to human actions), provides a focus on risk in relation to wildfires directly and immediately attributable to human action (see Table 3.5-2). Such an analysis reveals that over 80 percent of these ignitions are unintentional in nature, although some (e.g., those caused by fireworks, playing with matches, smoking, and warming fires) may be characterized as involving negligence. However, these unintentional ignitions account for only about 7.5 percent of the total area burned (approximately 6,300 acres). Only 14 ignitions during this period have been determined to be caused by arson, a small number in actual terms (approximately one arson incident every 2 years throughout the Santa Monica Mountains). However, while arson accounts for only about 18.5 percent of the number of fires caused by direct human action, it accounts for nearly 93 percent of the area consumed in these fires (about 78,000 acres).

Whether wildfires have been deliberately or unintentionally set, these data nonetheless indicate that ignitions in the Santa Monica Mountains are strongly associated with direct human action rather than natural causes, which play a relatively inconsequential role. The markedly increasing frequency of wildfire events in the mountains over the past century is evidence not of the hazard existing in the natural environment, but primarily the risk related to the growing presence of people that has altered the fire regime to one currently dominated by human-caused ignitions.

Table 3.5-2 Recorded Causes of Wildfire in the Santa Monica Mountains, 1982-2008 Excluding Lightning, Prescribed Burning, Power Line, and Unknown

Cause	Number	% of Number	Acres	% of Acres
Arson	14	18.4%	78,118.6	92.6%
Warming Fire	1	1.3%	4,707.0	5.6%
Smoking	6	7.9%	809.6	1.0%
Fireworks	4	5.3%	281.1	0.3%
Playing With Matches	7	9.2%	148.1	0.2%
Cooking Fire	9	11.8%	69.6	0.1%
Land Clearing	4	5.3%	54.4	0.1%
Trash Burning	2	2.6%	54.3	0.1%
Burning Building	2	2.6%	51.2	0.1%
Burning Vehicle	15	19.7%	40.4	0.0%
Aircraft	2	2.6%	31.1	0.0%
Exhaust – Power Saw	5	6.6%	19.0	0.0%
Burning Dump	3	3.9%	0.4	0.0%
Exhaust – Other	1	1.3%	0.2	0.0%
Burning Brush Pile	1	1.3%	0.1	0.0%
Total	*76*	*100.0%*	*84,385.1*	*100.0%*

Ignition Prediction Model

As discussed above, absolute predictions regarding wildfire incidents at a particular location or in a particular year are not possible given the involvement of a complex set of variables, including human action. However, some studies have been conducted in relation to wildfire behavior modeling to establish generalized predictions of ignitions in the Santa Monica Mountains in both temporal and spatial terms. These prediction models differ from incident-specific fire propagation models, which are intended to simulate how an individual fire at a given location will spread under a defined set of parameters related to weather conditions, terrain, fuel load, and locus of ignition. Such incident-specific models tend to demonstrate an outcome based on an already understood level of wildfire hazard, rather than establishing the level of wildfire risk per se. They are used, among other purposes, by firefighting agencies to prepare response plans for various wildfire scenarios. The Moritz Lab of the Department of Environmental Science, Policy, and Management at the University of California at Berkeley has developed models that instead of focusing on specific hypothetical incidents attempt to simulate the behavior of wildfire over a broad area and a long period of time. The lab has utilized the Santa Monica Mountains as a location in the development of the models (Moritz Lab 2010a).

Among the parameters that must be considered in such a model is the long-term spatial and temporal probability of ignition. The lab utilized fire histories from the Santa Monica Mountains and the nearby southern section of the Los Padres National Forest, as well as the type and extent of human activities in the Santa Monica Mountains, to determine annual rates of ignition over large shrubland regions at the urban interface. Based on this analysis, the lab established a predicted rate of 8 ignitions per year for the Santa Monica Mountains as a whole (Moritz Lab 2010b). This represents an average rate over a relatively long period of time (50 years or more), and the actual rate in any given year may deviate considerably from the average. This is consistent with reported wildfire ignitions in the Santa Monica Mountains between 1982 and 2008, which ranged from a low of one per year to a high of 16 per year but averaged (excluding intentionally set prescribed burns) slightly over 6 per year (ForEverGreen Forestry 2010b). This historical average annual rate is somewhat lower than the 8 established as an input parameter for the Moritz Lab model, but the model also applied factors that account for unreported ignitions that fail to develop into actual fires (Moritz Lab 2010b).

The physical distribution of the ignition events that might occur within the Santa Monica Mountains over a 50-year period under the model was based on a random process of selection within a spatially homogeneous setting rather than specified locations based on actual fire history or other factors (Moritz Lab 2010c). As might be expected, based on 8 ignitions per year over a 50-year timeframe (a total of 400 ignitions), the spatial distribution of ignitions in the simulations was relatively uniform across the entire Santa Monica Mountains (Moritz Lab 2010c). Based on this random spatial distribution, at least several of these ignition events would likely occur in the vicinity of Stone Canyon within the 50-year period. While this does not represent a categorical prediction of a wildfire event (or the severity a particular event), it is nonetheless generally indicative of the risk potential (i.e., the probability of ignition) over time in the Stone Canyon area.

Stone Canyon Fire History

There have been numerous recorded wildfires in and around Stone Canyon dating back to the 1930s. In 1938, a blaze of about 150 acres occurred in the northwest corner of what is now the SCRC. During the late-1950s, several relatively small fires (none greater than 300 acres) occurred in Stone Canyon south of the SCRC and in Beverly Glen and Benedict Canyons to the east of the SCRC. Beverly Glen Canyon was again the site of a wildfire of less than 100 acres in 1970 (National Park Service 2006), and Benedict Canyon was the site of a small 15-acre blaze in 2006 (Los Angeles Fire Department 2006). A number of small fires (less than 100 acres each) have also occurred in the Sepulveda Pass, about 1 mile west of Stone Canyon in 1979, 1994, 2008, and 2009 (National Park Service 2006; Los Angeles Times 2008a and 2009). All these fires were of unknown origin, but all are believed to have been human (rather than lightning) caused. However, none are considered arson. Other than the 1958 fire in Benedict Canyon, in which a number of homes were consumed, there was no major loss of structures in any of these fires (Los Angeles Times 2008b).

While the above fires would be considered comparatively minor in the context of the Santa Monica Mountains history of wildfires, the same cannot be said of the 1961 Bel Air-Brentwood Fire, in which Stone Canyon played a pivotal role. Shortly after 8:00 a.m. on November 6, 1961, a brush fire broke out on the northern flank of the Santa Monica Mountains, less than 0.5 miles below the ridgeline along which Mulholland Drive is located. By 8:15 a.m., the first alarms were received at local fire stations, and the first firefighters were on scene within 10 minutes. However, whipped by northeasterly Santa Ana winds gusting at above 50 mph, the fire had already leaped across Mulholland Drive and had consumed the northern portions of the SCRC surrounding Upper Stone Reservoir. By the time the fire was entirely under control early in the morning of November 8, 505 structures, including 484 homes, had been completely destroyed. Another 190 homes were seriously damaged. Suppressing the fire required the combined forces of 2,500 personnel, over 200 apparatus, and numerous fixed-wing aerial tankers drawn from firefighting agencies across the region (Greenwood 1961).

The Bel Air-Brentwood Fire demonstrated the type of wildfire propagation behavior anticipated when an ignition occurs simultaneously with the extremely high hazard conditions experienced during Santa Ana wind events. While over 6,000 acres were ultimately consumed as the fire spread from Beverly Glen Canyon on the east, to Mandeville Canyon on the west, Mulholland Drive on the north, and just north of Sunset Boulevard on the south, the fire did not fan out along a contiguous front but was actually many separate fires fed by the thousands of firebrands carried aloft by convection currents and the wind. These individual noncontiguous blazes formed numerous fronts that often linked up along ridgelines as the fire swept up slopes from different directions. This drastically complicated the firefighters' task, as they were powerless to establish a defensive perimeter. The firefighters' mission was further complicated by the requirement to extinguish structure fires that were likewise unpredictably spread across the landscape in a random pattern, forcing firefighters to adopt a triage approach to rescue those structures that stood the greatest chance of survival while bypassing those that were determined to be indefensible. Most of the acreage and structures lost in the fire was consumed in the first several hours. Demonstrating the dominant role played by weather, especially wind, in the spread and severity of wildfire in the Santa Monica Mountains, it was only after the Santa Ana winds diminished in the afternoon of November 6 that firefighters were able to halt the fire's westward and southward momentum (Greenwood 1961).

The Bel Air-Brentwood Fire is, in effect, the expression of wildfire risk at Stone Canyon actualized under the severe hazard conditions that are prevalent in the canyon. While the fire did not start in the SCRC, it gained momentum as it rapidly consumed the natural vegetative fuels while being pushed up the steep slopes of the canyon by strong gale force winds. The exact nature of the initial ignition is unknown. It is believed to be accidental but nonetheless human-caused. Until the 2008 Sayre fire in Sylmar, which consumed over 600 structures, including 487 residences, the Bel Air-Brentwood Fire was the worst disaster in the City's history relative to the number of homes lost (InciWeb 2008).

However, other than the 1938 wildfire of unknown origin and a series of prescribed burns conducted in the mid-1980s under very controlled conditions (United States Fire Administration, 1988), there have been no recorded ignitions within the SCRC itself. This is likely a reflection of the strong association of ignitions with human activity and the fact that the SCRC has remained closed to public access. Although it has been the site of construction, maintenance, and operational activity related to water treatment and storage, these activities have occurred under highly controlled conditions that largely limit the likelihood of ignition events.

Summary of Wildfire Hazard and Risk

The historically recent and current pattern of wildfire (temporally, spatially, and in terms of varying measures of severity) in the Santa Monica Mountains environment that Stone Canyon typifies is not representative of the natural fire regime of the mountains. It is instead dominated by natural factors that are beyond the control of humans (topography, climate, and weather) combined with increased land development and other human activities in the wildland environment and the resultant human-caused ignitions. Widespread fuel reduction on a landscape level either through thinning, prescribed burning, or, most commonly, frequent repeated wildfires in the same locations, has not proven to reduce the incidence of wildfire in the Santa Monica Mountains; that is, it has not been demonstrated that fuel age in and of itself plays a critical role related to the frequency or severity of wildfires in the Santa Monica Mountains in the context of the other factors involved.

While some level of hazard exists to the natural environment from frequent recurrent burning, generally considered to be less than every 35 years on a repeated basis according to United States Forest Service fire regime classifications (ForEverGreen Forestry 2010a), native Santa Monica Mountain plant communities are generally adapted to recover from wildfire. The primary hazard related to wildfire is usually measured in terms of potential human costs from loss of property, injury, or death. The escalation of this hazard can be controlled to a degree in the long term through land development restrictions that limit the interface between urban and fire-prone wildland areas. The hazard level can also be controlled to some extent in the short term by the application of appropriate wildfire defense strategies for existing development. However, the hazard created by the existing WUI is nonetheless currently prevalent throughout the Santa Monica Mountains, including extensively in and around Stone Canyon. As indicated by the VHFHS Zone designation for the Stone Canyon area, this hazard is largely inherent, given the uncontrollable factors of fuel, topography, climate, and weather intrinsic to the natural setting within which development has occurred.

As demonstrated by the causes and increased frequency of wildfires in the Santa Monica Mountains over the last century (including in and around Stone Canyon), the risk of an actual ignition event is clearly a function of human activities. Although increased vigilance and care may reduce this risk, especially in cases of negligence, most ignition events are unintentional in nature and are, in that regard, generally difficult to avoid. Furthermore, of those causes related to direct human action, nearly the single most common cause and the one responsible for vastly the largest number of acres consumed by fire is arson, which is a deliberate act that, by its very nature, is difficult to prevent.

Based on all of the above discussed factors, both the existing hazard and risk related to wildfire in and around the SCRC, including catastrophic events similar to the 1961 Bel Air-Brentwood Fire, are considered extremely high and only limitedly controllable.

3.5.2 Environmental Impacts

Thresholds of Significance

According to CEQA, the public access component of the proposed project would have a significant environmental impact if it would expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands. Because both the existing wildfire hazard and risk in and around Stone Canyon are considered extremely high and only limitedly controllable, and based on the history of and the potential for catastrophic wildfire events in the Stone Canyon area, increases in the levels of hazard and/or risk related to public access at the SCRC, when compared to the existing condition, would be considered a significant impact.

Impact Analysis

WILD-1 *The public access component of the proposed project would expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.*

Based on the type and degree of public access planned for the SCRC under the proposed project, there would generally be no significant change in the existing level of wildfire hazard (independent of wildfire risk) in the canyon or the surrounding area because the factors that define the level of hazard (i.e., fuels, topography, climate and weather, land use, and wildfire hazard management) would remain essentially unaffected by public access to the property. However, given that wildfire hazard is largely (although not entirely) measured in terms of potential human costs from loss of property, injury, or death, public access to the SCRC as defined under the proposed project would increase to some extent the level of hazard because it would expose additional people (i.e., trail users) to a potential threat of wildfire in Stone Canyon. Assuming a wildfire was to occur in or around Stone Canyon, depending on the location of origin and the weather conditions at the time, the threat to trail users could be severe especially because only a single point of egress from the SCRC (at the Mulholland Drive gate) would be available, potentially hampering evacuation from the property. This increase in the wildfire hazard level could be considered a significant impact in and of itself; however, the primary impact with respect to wildfire associated with the public access component of the proposed project is an increased risk related to a higher probability of ignition.

As discussed in Chapter 2 of this EIR, based on a maximum number of 25 parking spaces that would be provided to support the trails function (as well as the general inaccessibility of the SCRC to pedestrian users), several assumptions have been made regarding the anticipated level of visitor use at the SCRC. The level of use would vary between weekend days and weekdays. On weekend days, the average occupancy for vehicles would be 1.5 people. This would result in a peak use of about 38 visitors on site at a single time, assuming the parking area was fully occupied. However, the parking area would not be expected to be fully occupied throughout the day. Given the nature and size of the proposed trails elements, visitors would be expected to stay approximately 1 to 2 hours at the SCRC, and there would be a turnover of visitors leaving and entering the site during the day. Based on such factors as weather and holidays, the rate of visitor turnover may vary considerably from weekend to weekend throughout the year, but an average rate of 2 full turnovers per weekend day has been assumed (i.e., 50 visitor vehicles would enter and leave the site during the day). Based on vehicle occupancy of 1.5, this turnover rate would result in an average of 75 visitors per day at the SCRC on weekends. On weekdays, the average occupancy of vehicles would be greater than 1 but less than the 1.5 average for weekend days, resulting in an average occupancy of 1.25 people per vehicle. As on weekend days, the rate of visitor turnover may vary considerably from week to week throughout the year, but the average turnover rate on a weekday is assumed to be half that of a weekend day (i.e., 25 visitor vehicles would enter and leave the site during the day). This turnover rate and vehicle occupancy would result in an average of about 31 visitors per day at the SCRC on weekdays. Based on these factors, an average of approximately 16,000 recreation users would visit the SCRC on an annual basis.

As evidenced in Table 3.5-2 above, there is little correlation between recreation use and wildfires in the Santa Monica Mountains, especially the limited type of day use consisting basically of hiking that would occur at the SCRC under the proposed project. Many or most of the causes of wildfire exhibited in the table are related to activities that would not be anticipated to occur in association with public trails use at Stone Canyon (e.g., burning trash or the operation of power tools). No formal picnic areas would be provided at the SCRC, and smoking and any type of fires, whether a campfire or the use of a cooking stove, would be prohibited. However, as described in Section 3.5.1, there is nonetheless an overwhelming correlation between the marked increase in the incidence of wildfires in the Santa Monica Mountains over the past century and human activity in general. In addition, there is abundant evidence to conclude that most wildfires in the Santa Monica Mountains result from direct human action.

While the restrictions related to recreation use at the SCRC would limit the risk of ignition events, the vast majority of wildfires in the Santa Monica Mountains can be traced to unintentional causes, including those that are a result of carelessness or negligence (e.g., from smoking). These unintentional ignitions are difficult to entirely control because they are related to human behavior and are random occurrences. While specifically unpredictable, the probability of such ignitions occurring at the SCRC, including from individuals that may disregard prohibitions on certain activities, would increase based on providing public access to the property when compared to the current closed access status of the complex. Although this increase in probability is difficult to quantify, based on the predicted number of annual visitors to the SCRC, even a very small percentage of probability could represent a number of ignition events over several decades. For example, one unintentional ignition event in a decade would represent a 0.0006 percent probability factor in relation to the projected number of recreation visitors to the SCRC over this period (160,000). However, one ignition would still represent a relatively high proportion of the total number of ignitions anticipated throughout the entire Santa Monica Mountains during a decade (80 ignitions, based on a predicted average of 8 ignitions per year), and it would be significant in relation to the historical trend of ignition events at the SCRC. Based on the weather conditions, the site of ignition, and other factors, a single ignition event may not but could develop into a wildfire that is not self-extinguishing or that cannot be readily controlled, especially given the very high level of wildfire hazard that characterizes the Stone Canyon environment and the potential for a catastrophic outcome.

Furthermore, as discussed above, of those causes of wildfire in the Santa Monica Mountains related to direct human action, nearly the single most common cause and the one responsible for the vast majority of acreage consumed by fire is arson, which is a deliberate act meant to circumvent the prohibitions established to prevent ignitions. While arson set wildfires may occur on both private (i.e., publicly inaccessible) and public property, several studies have documented a correlation between public accessibility to an area and the incidence of wildfires in general (Hannay 2000; Morrison 2007). The opening to public access of portions of the currently closed SCRC could provide additional targets of opportunity for acts of arson, which are, by their very nature, difficult to prevent and which predictably tend to occur at the time of greatest wildfire hazard related to weather.

The essentially complete absence of ignition events within the SCRC that have developed into wildfires over the last 70 years may reflect the closed access to the property except for a limited and controlled set of activities related to water treatment and distribution.[1] In this regard, the SCRC, potentially related to its closed status, has more closely resembled the natural fire regime of the region than have many other areas within the Santa Monica Mountains that have experienced more frequent and severe wildfire episodes.

Because both the existing hazard and risk related to wildfire in and around the SCRC are considered extremely high and only limitedly controllable (as reflected in the existing VHFHS Zone designation for the area), the increase in risk associated with providing public access to the SCRC for trails use, although not specifically quantifiable, is considered a significant environmental impact in relation to exposing people and/or structures to substantial loss, injury, or death related to wildfire, especially because it could result in a potentially catastrophic event similar to the one realized in the 1961 Bel Air-Brentwood Fire. The implementation of mitigation measures WILD-A and WILD-B is required.

3.5.3 Mitigation Measures

The reduction of the very high wildfire hazard in the Stone Canyon area to a less than significant level is highly impractical, if not impossible, to achieve. This is largely because many of the most critical factors that contribute to that hazard are essentially uncontrollable. These include topography, climate and weather, and the existing pattern of development in and around Stone Canyon, which has created an extensive WUI environment. The most proven wildfire hazard management practices in the WUI environment, including the “hardening” of buildings and the creation of a defensible perimeter involving vegetation management around structures, are already enforced in the Stone Canyon area by the LAFD through authority granted in various sections of the Los Angeles Municipal Code. In this sense, these management practices would not represent further mitigation to reduce any increase in hazard associated with providing public access to the SCRC for trails use. Furthermore, since these wildfire management practices are focused on limiting the hazard in the immediate vicinity of structures, they are not generally applicable to public trail functions physically separated from the structures.

The extensive modification of vegetative fuels on a landscape-wide level (i.e., throughout the SCRC beyond the defensive perimeter zone around structures) would also be ineffective at reducing the general frequency and severity of fires in the canyon. Numerous studies have demonstrated that, unlike in traditional forested environments of the West, vegetative fuel age, accumulation, and continuity in mountainous shrubland environments like Stone Canyon do not explain the pattern of wildfires, which is predominantly controlled by other factors, especially weather and human activity. Wildfires in these environments have been shown to burn through large areas characterized by a mosaic of various fuel ages (Moritz 2004; McDaniel 2008; Keeley 2009). The general ineffectiveness of landscape-level fuel modification in chaparral and coastal sage scrub ecosystems is demonstrated by repeated wildfires in portions of the Santa Monica

[1] The last recorded wildfire to occur within the current boundaries of the SCRC was in 1938 (National Park Service 2006). A series of prescribed burns were conducted in the SCRC in the mid-1980s under controlled conditions that did not significantly increase the risk of actual wildfire. The 1961 Bel Air-Brentwood Fire involved much of the SCRC acreage, but it was ignited north of Mulholland Drive, not within the complex itself.

Mountains despite the reduction in fuel load that has resulted from relatively recent previous burns. Numerous areas in the mountains have burned nearly every decade between the 1920s and 2007, and some areas have been subject to repeated large wildfires separated by only a few years during this period (National Park Service 2006). In addition, the relatively constant and extensive modification of the natural vegetation in Stone Canyon by frequent prescribed burning or heavy cutting that would be necessary to provide even limited hazard reduction would be extremely impractical and prohibitively expensive, and it could also create significant environmental consequences, including those related to aesthetics; runoff, erosion, and landslides; and biological resources (including the potential long-term degradation of the natural habitat itself).

Under the proposed project, the operation and maintenance of the trails access function would be the responsibility of LADRP and/or the Santa Monica Mountains Conservancy. The publicly accessible portions of the SCRC would be segregated from the LADWP-controlled portions of the property, and therefore, generally unmonitored by LADWP personnel involved in the operation and maintenance of drinking water facilities at the property. However, providing on-site LADRP or Santa Monica Mountains Conservancy personnel to oversee recreation activity related to trails use would decrease the essentially unmonitored nature of public access under the proposed project. The presence of recreation personnel at the SCRC throughout the hours of public use would also require the provision of some level of on-site support facility, including restrooms and offices, which is not currently planned for under the proposed project. Because the on-site monitoring of recreation activity at the SCRC could discourage the incidence of certain unintentional or intentional ignition events, thus reducing the impact of public access related to the increased risk of wildfire, mitigation measure WILD-A is set forth as follows.

WILD-A A park ranger shall be present on site at the SCRC during all operating hours and shall be responsible for unlocking and locking the public access gate at the Mulholland Drive entry to the SCRC. The ranger shall have the authority to enforce regulations and codes related to park use, detain individuals in violation of codes, and, if necessary, make arrests. The ranger shall be trained in peace officer standards, first aid, and fire fighting techniques.

As discussed above, the highest wildfire hazard periods in Stone Canyon occur during Santa Ana wind events, when winds can reach sustained speeds of 40 mph, temperatures can be elevated, and relative humidity can be critically low, all factors that, when combined with the steep terrain and available fuels that characterize the canyon, can contribute to the potential for catastrophic wildfire incidents. Because precluding public access to the SCRC during Santa Ana wind events would lower the probability of an ignition incident occurring when the wildfire hazard conditions were at their highest level, thus reducing the impact of public access related to the increased risk of wildfire, mitigation measure WILD-B is set forth as follows.

WILD-B Public access to the SCRC shall be prohibited during all red flag warning days as determined by the LAFD, normally considered days on which winds are in excess of 25 mph and relative humidity is less than 15 percent. The Mulholland Drive public entry gate shall remain locked during red flag warning days, and a sign stating the reason for prohibiting entry shall be posted.

3.5.4 Significance After Mitigation

While an on-site park ranger (as specified in mitigation measure WILD-A) would, in theory, reduce the risk of ignition events, they could not effectively monitor all activity throughout the publicly accessible portions of the SCRC. The presence of an on-site park ranger may not be effective in eliminating the probability of arson events, which, as discussed above, are rare but destructive and, by their very nature, are carried out in a manner to evade detection. Furthermore, given the very low but nevertheless significant number of unintentional ignitions that might be predicted based on the projected visitor attendance at the SCRC, the provision of an on-site park ranger may not eliminate or substantially reduce the potential wildfire risk associated with public access.

Although the closing of the SCRC to the public during red flag warning days (as specified in mitigation measure WILD-B) would lower the probability of an ignition event during the periods of highest wildfire hazard conditions in Stone Canyon, it would not eliminate the potential of ignition events related to public access in the SCRC that could, under certain conditions, develop into a major wildfire. Acute weather conditions, including wind, can develop unpredictably, and proper warning may not always be provided in time to close the SCRC to public access. Furthermore, as discussed above, the opening to public access of portions of the currently closed SCRC could provide additional targets of opportunity for arsonists, regardless of red flag restrictions.

Because neither mitigation measure WILD-A or WILD-B would substantially reduce the increased probability of wildfire at Stone Canyon related to public access and since both the existing wildfire hazard and wildfire risk in and around Stone Canyon are considered extremely high and only limitedly controllable, and based on the history of and the potential for catastrophic wildfire events in the Stone Canyon area, the impact related to wildfire and public access at the SCRC would remain significant and unavoidable.

CHAPTER 3.6
NOISE

This chapter evaluates noise and vibration impacts associated with the implementation of the proposed project. The analysis in this chapter assesses existing noise and vibration conditions at the project site and in its vicinity, and the short-term construction and long-term operational noise and vibration impacts associated with the proposed project. The noise technical report is included as part of Appendix D of this EIR.

3.6.1 Environmental Setting

Noise Characteristics and Effects

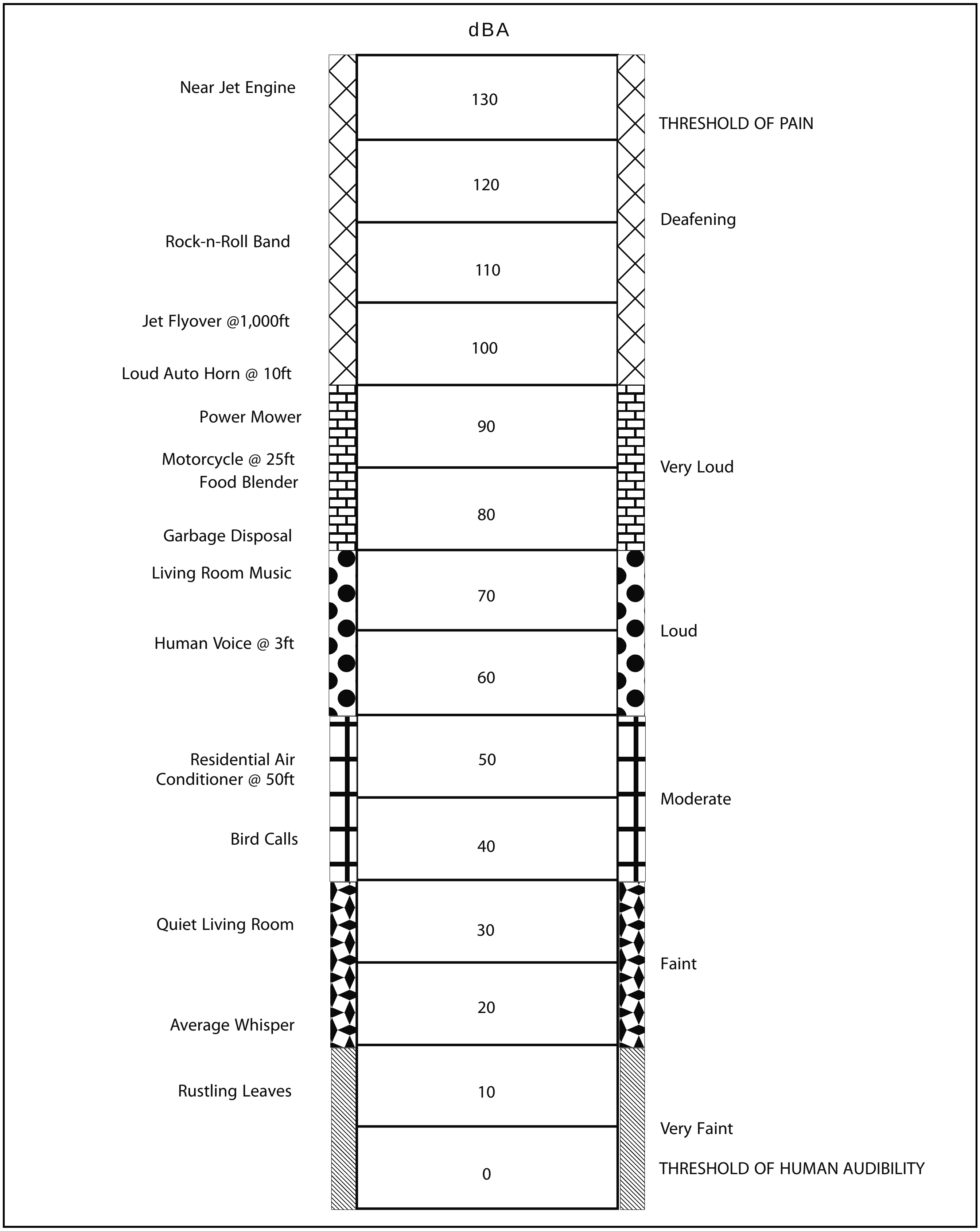
Characteristics of Sound

Sound is technically described in terms of the loudness (amplitude) and frequency (pitch) of the sound. The standard unit of measurement for sound is the decibel (dB). The human ear is not equally sensitive to sound at all frequencies. The "A-weighted scale," abbreviated dBA, reflects the normal hearing sensitivity range of the human ear. On this scale, the range of human hearing extends from approximately 3 to 140 dBA. Figure 3.6-1 provides examples of A-weighted noise levels from common sounds.

Noise Definitions

This noise analysis discusses sound levels in terms of Community Noise Equivalent Level (CNEL) and Equivalent Noise Level (L_{eq}). CNEL is an average sound level during a 24-hour period. CNEL is a noise measurement scale, which accounts for noise source, distance, single event duration, single event occurrence, frequency, and time of day. Human reaction to sound between 7:00 p.m. and 10:00 p.m. is as if the sound were actually 5 dBA higher than if it occurred from 7:00 a.m. to 7:00 p.m. From 10:00 p.m. to 7:00 a.m., humans perceive sound as if it were 10 dBA higher due to the lower background level. Hence, the CNEL is obtained by adding an additional 5 dBA to sound levels in the evening from 7:00 p.m. to 10:00 p.m. and 10 dBA to sound levels in the night from 10:00 p.m. to 7:00 a.m. Because CNEL accounts for human sensitivity to sound, the CNEL 24-hour figure is always a higher number than the actual 24-hour average.

L_{eq} is the average noise level on an energy basis for any specific time period. The L_{eq} for one hour is the energy average noise level during the hour. The average noise level is based on the energy content (acoustic energy) of the sound. L_{eq} can be thought of as the level of a continuous noise which has the same energy content as the fluctuating noise level. The equivalent noise level is expressed in units of dBA.



Source: Terry A. Hayes Associates 2011

Figure 3.6-1
A-Weighted Decibel Scale

Effects of Noise

Noise is generally defined as unwanted sound. The degree to which noise can impact the human environment ranges from levels that interfere with speech and sleep (annoyance and nuisance) to levels that cause adverse health effects (hearing loss and psychological effects). Human response to noise is subjective and can vary greatly from person to person. Factors that influence individual response include the intensity, frequency, and pattern of noise, the amount of background noise present before the intruding noise, and the nature of human activity that is exposed to the noise source.

Audible Noise Changes

Studies have shown that the smallest perceptible change in sound level for a person with normal hearing sensitivity is approximately 3 dBA. A change of at least 5 dBA would be noticeable and may evoke a community reaction. A 10-dBA increase is subjectively heard as a doubling in loudness and would likely cause a community response.

Noise levels decrease as the distance from the noise source to the receiver increases. Noise generated by a stationary noise source, or “point source,” would decrease by approximately 6 dBA over hard surfaces and 7.5 dBA over soft surfaces for each doubling of the distance. For example, if a noise source produces a noise level of 89 dBA at a reference distance of 50 feet, then the noise level would be 83 dBA at a distance of 100 feet from the noise source, 77 dBA at a distance of 200 feet, and so on, over a hard surface. Noise generated by a mobile source would decrease by approximately 3 dBA over hard surfaces and 4.5 dBA over soft surfaces for each doubling of the distance.

Generally, noise is most audible when traveling by direct line-of-sight. Line-of-sight is an unobstructed visual path between the noise source and the noise receptor. Barriers, such as walls, berms, natural terrain, or buildings that break the line-of-sight between the source and the receiver greatly reduce noise levels from the source since sound can only reach the receiver by bending over or around the barrier (diffraction). Sound barriers can reduce sound levels by up to 20 dBA. However, if a barrier is not high or long enough to break the line-of-sight from the source to the receiver, its effectiveness is greatly reduced.

Vibration Characteristics and Effects

Characteristics of Vibration

Vibration is an oscillatory motion through a solid medium in which the motion’s amplitude can be described in terms of displacement, velocity, or acceleration. Vibration can be a serious concern, causing buildings to shake and rumbling sounds to be heard. In contrast to noise, vibration is not a common environmental problem. It is unusual for vibration from sources such as buses and trucks to be perceptible, even in locations close to major roads. Some common sources of vibration are trains, buses on rough roads, and construction activities, such as blasting, pile driving, and heavy earth-moving equipment.

Vibration Definitions

There are several different methods that are used to quantify vibration. The peak particle velocity is defined as the maximum instantaneous peak of the vibration signal. The peak particle velocity is most frequently used to describe vibration impacts to buildings and is usually measured in inches per second. The root mean square amplitude is most frequently used to describe the effect of vibration on the human body. The root mean square amplitude is defined as the average of the squared amplitude of the signal. Decibel notation is commonly used to measure root mean square. The decibel notation acts to compress the range of numbers required to describe vibration (Federal Transit Administration 2006).

Effects of Vibration

High levels of vibration may cause physical personal injury or damage to buildings. However, ground-borne vibration levels rarely affect human health. Instead, most people consider ground-borne vibration to be an annoyance that may affect concentration or disturb sleep. In addition, high levels of groundborne vibration may damage fragile buildings or interfere with equipment that is highly sensitive to groundborne vibration (e.g., electron microscopes). To counter the effects of groundborne vibration, the Federal Transit Administration has published guidance relative to vibration impacts. According to the Federal Transit Administration, fragile buildings can be exposed to groundborne vibration levels of 0.3 inches per second without experiencing structural damage (2006).

Perceptible Vibration Changes

In contrast to noise, groundborne vibration is not a phenomenon that most people experience every day. The background vibration velocity level in residential areas is usually 50 root mean square or lower, well below the threshold of perception for humans, which is around 65 root mean square (Federal Transit Administration 2006). Most perceptible indoor vibration is caused by sources within buildings, such as the operation of mechanical equipment, movement of people, or slamming of doors. Typical outdoor sources of perceptible ground-borne vibration are construction equipment, steel-wheeled trains, and traffic on rough roads. If the roadway is smooth, the vibration from traffic is rarely perceptible.

3.6.2 Existing Environmental Setting

Existing Noise Environment

The existing noise environment of the SCRC is very low level because of the site's location within a canyon and the controlled access and limited activity that occurs on site. The noise levels in the SCRC and the vicinity are typical of a quiet single-family residential neighborhood and undeveloped areas. Vehicular traffic, while relatively minimal, is the primary source of noise in the vicinity because of the project site's proximity to Mulholland Drive. Noise levels along Mulholland Drive in the project vicinity are noticeably higher due to the regular vehicle traffic along this roadway to and from I-405.

Sound measurements were taken using a SoundPro DL Sound Level Meter between 11:00 a.m. and 1:00 p.m. on June 7, 2010, to determine existing ambient daytime off-peak noise levels in the vicinity of the project site (see Figure 3.6-2 for noise measurement locations). These readings were used to establish existing ambient noise conditions for the Draft EIR, and to provide a baseline for evaluating construction and operational noise impacts. As shown in Table 3.6-1, existing ambient sound levels for the surrounding area range between 53.7 and 61.3 dBA L_{eq}. The existing project site noise level was approximately 47.1 dBA L_{eq}.

SOURCE: Terry A. Hayes Associates 2011

LEGEND:

Upper Stone Canyon Reservoir

Noise Monitoring Locations

1. Roscomare Road Elementary School
2. Single-Family Residences on Roscomare Road
3. Mulholland Drive and Antelo Road
4. American Jewish University/Stephen S. Wise Elementary School
5. On-Site Access Road

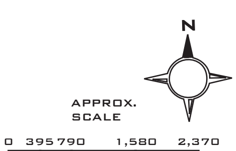


Figure 3.6-2
Noise Monitoring Locations

Table 3.6-1 Existing Noise Levels

#	Noise Monitoring Location	Sound Level (dBA, L_{eq})
1	Single-family residences west of project site	53.7
2	Roscomare Road Elementary School	57.7
3	Single-family residences on Mulholland Drive and Antelo Place	61.1
4	American Jewish University/Stephen S. Wise Elementary School	61.3
5	Interior site access road northeast of Upper Stone Reservoir	47.1

Source: Terry A. Hayes Associates 2011.

Existing Vibration Environment

Similar to the environmental setting for noise, the existing vibration environment in the SCRC is very low level, with little or no vibration. There are no stationary sources of vibration located near the project site. Heavy-duty truck travel is minimal, and occasional medium- or light-duty maintenance trucks access the project site. Medium-duty trucks can generate some groundborne vibrations that vary depending on vehicle type, weight, and pavement conditions. As heavy trucks typically operate on major streets, existing groundborne vibration in the project vicinity is minimal because vibration levels from adjacent roadways are not perceptible at the project site.

Sensitive Receptors

Noise- and vibration-sensitive land uses are locations where people reside or where the presence of unwanted sound would adversely affect the use of the land. Residences, schools, hospitals, guest lodging, libraries, and some passive recreation areas would be considered noise- and vibration-sensitive and may warrant unique measures for protection from intruding noise and vibration.

Sensitive receptors surrounding Upper Stone Reservoir include the following:

- Single-family residences located on Antelo Place and Roscomare Road, set back approximately 650 feet west of the SCRC construction access road
- Single-family residences east and west of Upper Stone Reservoir
- Roscomare Elementary School, approximately 2,150 feet west of Upper Stone Reservoir

Off-site sensitive receptors near the haul truck route include the following:

- Single-family residences located west of the SCRC along Mulholland Drive
- American Jewish University located on Mulholland Drive
- Stephen S. Wise Elementary School located on Mulholland Drive

The above sensitive receptors represent the nearest noise-sensitive land uses with the potential to be impacted by the proposed project or haul truck route. Additional residential uses are located in the surrounding community, including on the ridgelines above Upper Stone Reservoir.

Vehicular Traffic

Vehicular traffic is the predominant noise source in the vicinity of the project site. Using existing traffic volumes provided by the traffic consultant and the Traffic Noise Model Look-Up Program, the existing CNEL was modeled for various roadway segments in the project area. Existing modeled mobile noise levels are shown in Table 3.6-2.

Table 3.6-2 Existing Estimated Mobile Source Noise Levels

Roadway Segment	Estimated CNEL (dBA)
Mulholland Drive from Roscomare Road to Casiano Road	68.0
Mulholland Drive from Casiano Road to Skirball Center Drive	67.8
Mulholland Drive from Roscomare Road to Stone Canyon Drive	67.0
Mulholland Drive from Stone Canyon Road to Nicada Drive	67.3

Source: Terry A. Hayes Associates 2011.

As shown in Table 3.6-2, existing peak-hour mobile noise levels range from 67.0 to 68.0 dBA CNEL. Modeled vehicle noise levels are typically lower than the noise measurements along similar roadway segments as modeled noise levels do not take into account additional noise sources (e.g., sirens, reflected noise, and non-vehicular noise).

3.6.3 Regulatory Setting

City of Los Angeles Noise Ordinance

The City of Los Angeles has established policies and regulations concerning the generation and control of noise that could adversely affect its citizens and noise sensitive land uses. Regarding construction, the Los Angeles Municipal Code (Chapter IV, Article 1, Section 41.40 and Chapter XI, Article 2, Section 112.04) indicates that no construction or repair work shall be performed on weekdays between the hours of 9:00 p.m. and 7:00 a.m. the following day, since such activities can generate loud noises and disturb persons occupying sleeping quarters in any adjacent dwelling, hotel, apartment, or other place of residence. No construction or repair work shall be performed before 8:00 a.m. or after 6:00 p.m. on any Saturday or on a federal holiday, or at any time on Sunday. Under certain conditions, the City may grant a waiver to allow limited construction activities to occur outside of the limits described above.

The LAMC (Chapter XI, Article 2, Section 112.05) also specifies the maximum noise level for the following powered equipment: crawler-tractors, dozers, rotary drills and augers, loaders, power shovels, cranes, derricks, motor graders, paving machines, off-highway trucks, ditchers, trenchers, compactors, scrapers, wagons, pavement breakers, compressors and pneumatic or other powered equipment. According to Section 112.05, noise from construction activity shall not exceed the noise limits established by the federal government for various powered tools and pieces of operating equipment.

The City does not have adopted standards for groundborne vibration.

3.6.4 Environmental Impacts

Methodology

The noise analysis considers construction and operational sources of noise and vibration. Construction noise level thresholds are based on information obtained from the *L.A. CEQA Thresholds Guide* (City of Los Angeles 2006). The noise level during the construction period at each receptor location was calculated by (1) making a distance adjustment to the construction source sound level and (2) logarithmically adding the adjusted construction noise source level to the ambient noise level. The predicted noise level calculations are conservative because they assume line-of-sight between construction noise sources and nearby receptors even though the line-of-sight may be broken by terrain. Operational noise levels were calculated based on information provided in the traffic study and stationary noise sources that would be located on the project site (e.g., mechanical equipment). Vibration levels were estimated based on information provided by the Federal Transit Administration (2006).

Thresholds of Significance

As part of the Initial Study (see Appendix A), it was determined that the proposed project would not expose persons to excessive noise from public or private airports. Accordingly, these issues are not further analyzed in the EIR.

Pursuant to the CEQA Guidelines, the proposed project would have a significant effect on noise if it would:

- Expose persons to or generate noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;

- Expose persons to or generate excessive groundborne vibration or groundborne noise levels;

- Create a substantial permanent increase in ambient noise levels in the vicinity of the project above levels without the project; or

- Create a substantial temporary or periodic increase in ambient noise levels in the vicinity of the project, in excess of noise levels existing without the project.

To establish definitive thresholds for noise impact, the *L.A. CEQA Thresholds Guide* (City of Los Angeles 2006) was utilized. According to the guide, the proposed project would result in significant construction noise impacts if:

- Construction activities lasting more than one day would exceed existing ambient noise levels by 10 dBA or more at a noise sensitive use;
- Construction activities lasting more than 10 days in a 3-month period would exceed existing ambient noise levels by 5 dBA or more at a noise sensitive use; and/or
- Construction activities would exceed the ambient noise level by 5 dBA at a noise sensitive use between the hours of 9:00 p.m. and 7:00 a.m. Monday through Friday, before 8:00 a.m. or after 6:00 p.m. on Saturday, or anytime on Sunday.

During operation, the proposed project would result in a significant noise impact if:

- Mobile noise causes a 10-dBA or more increase in noise level; and/or
- Stationary noise causes a 5-dBA or more increase in noise level.

There are no adopted state or City groundborne vibration standards. Based on federal guidelines, a significant construction or operational vibration impact would result if:

- Construction or operational activity would expose buildings to the Federal Transit Administration building damage threshold level of 0.3 inches per second.

Impact Analysis

NOISE-1 *Construction of the proposed project would expose persons to or generate noise levels in excess of City standards and create a substantial temporary increase in ambient noise levels in the vicinity of the project site.*

Construction of the proposed project would result in temporary increases in ambient noise levels in the vicinity of the project site on an intermittent basis. The increase in noise would occur during certain periods of the approximately 4-year construction schedule. Noise levels would fluctuate depending on the construction phase, equipment type and duration of use, distance between the noise source and receptor, and presence or absence of noise attenuation barriers, including terrain.

Construction activities typically require the use of equipment, such as pneumatic impact equipment, excavation and grading equipment, and trucks. Typical noise levels from various types of equipment that may be used during construction are listed in Table 3.6-3. The table shows noise levels at distances of 50 and 100 feet from the construction noise source.

Table 3.6-3 Maximum Noise Levels of Common Construction Machines

Noise Source	Noise Level (dBA)[1]	
	50 feet	100 feet
Front Loader	80	72.5
Trucks	89	81.5
Cranes (derrick)	88	80.5
Jackhammer	90	82.5
Generator	77	69.5
Back Hoe	84	76.5
Tractor	88	80.5
Scraper/Grader	87	79.5
Paver	87	79.5
Impact Pile Driving	101	93.5
Auger Drilling	77	69.5

[1] Assumes a 7.5-dBA drop-off rate for noise generated by a point source and traveling over soft surfaces.

Source: City of Los Angeles 2006; Terry A. Hayes Associates 2011.

The noise levels shown in Table 3.6-4 take into account the likelihood that more than one piece of construction equipment would be in operation at the same time and lists the typical overall noise levels that would be expected for each phase of construction. These noise levels are based on surveys conducted by the EPA in the early 1970s. Since 1970, regulations have been enacted to reduce noise generated by certain types of construction equipment to meet worker noise exposure standards. However, many older pieces of equipment are still in use. Thus, the construction phase noise levels indicated in Table 3.6-4 represent worst-case conditions. As the table shows, the highest noise levels are expected to occur during the grading/excavation phase of construction. A typical piece of equipment is assumed to be active for 40 percent of the 8-hour workday (consistent with the EPA studies of construction noise), generating a maximum noise level of 89 dBA at a reference distance of 50 feet.

Table 3.6-4 Typical Outdoor Construction Noise Levels

Construction Phase	Noise Level at 50 feet (dBA)
Construction Clearing	84
Grading/Excavation	89
Foundations	78
Structural	85
Finishing	89

Source: City of Los Angeles 2006.

Local sound reflection effects could be present at individual property locations due to the spatial relationship of hardscape (e.g., driveway), balcony overhangs, and buildings that may be present on each given property. For example, a person may experience a higher sound level if standing under a covered patio as opposed to standing in an open backyard due to local sound reflections from the wall and patio overhang. Because of the topography of the canyon, sound may be slightly amplified as it travels up the canyon walls. However, given the terrain, vegetation, and distance from the project site, these effects would be generally insignificant at nearby sensitive receptor locations.

On-site Construction Equipment Noise

Some construction activity for the proposed project would occur primarily inside the drained Upper Stone Reservoir and in the bottom of the canyon, which would further attenuate the construction noise because noise levels are directly related to the “line-of-sight,” or the visibility factor of the noise source. However, for the purposes of providing a conservative analysis, a reduction for below ground construction was not taken into account in the determination of impact. The peak construction noise is therefore assumed to be 89 dBA at a distance of 50 feet from the construction. On-site construction noise levels are shown in Table 3.6-5 below.

Table 3.6-5 On-site Construction Noise Impact – Unmitigated

Sensitive Receptor	Distance (feet)[1]	Maximum Construction Noise Level (dBA)[2]	Existing Ambient (dBA, L_{eq})[3]	New Ambient (dBA, L_{eq})[4]	Increase[5]
Housing west of Upper Stone Reservoir	1,800	50.4	53.7	55.4	1.7
Housing east of Upper Stone Reservoir	1,400	50.4	53.7	55.4	2.5
Housing directly north of Upper Stone Reservoir	2,500	47.5	61.1	61.3	0.2
Roscomare Road Elementary School	2,300	48.2	57.7	58.2	0.5
Housing southwest of Upper Stone Reservoir	2,150	48.8	53.7	54.9	1.2

[1] Distance of noise source from receptor.
[2] Construction noise source's sound level at receptor location.
[3] Pre-construction activity ambient sound level at receptor location.
[4] New sound level at receptor location during construction period, including noise from construction activity.
[5] An incremental noise level increase of 5 dBA or more would result in a significant impact.
Source: Terry A. Hayes Associates 2011.

Table 3.6-5 shows that construction activity within Upper Stone Reservoir may temporarily and intermittently increase daytime ambient noise levels by as much as 2.5 dBA as experienced at nearby sensitive receptors surrounding Upper Stone Reservoir. These numbers take into account dissipation of noise based on distance from the source over soft surfaces. As shown in Table 3.6-5, none of the sensitive receptors would experience an increase in ambient noise levels greater than the 5-dBA significance threshold. The impact would be less than significant, and no mitigation is required.

On-site Construction Mobile Noise

Haul trucks would utilize the interior paved road running from Upper Stone Reservoir to Mulholland Drive to deliver materials and remove demolition debris. The nearest sensitive land use to the interior site road would be residences located on Antelo Place and Roscomare Road, the closest of which are approximately 650 feet from the road. As shown in Table 3.6-3, haul trucks typically generate a noise level of 89 dBA at 50 feet. Truck noise experienced at the closest residence would be approximately 59.2 dBA using a soft-surface distance attenuation rate of 7.5 dBA for every doubling of distance. Based on a 47 dBA L_{eq} existing ambient noise level, the new ambient noise level would be 59.5 dBA L_{eq}. These sensitive receptors would experience a 12.5 dBA incremental noise increase from haul truck trips within the SCRC, which would be greater than the 5-dBA significance threshold. Because the background existing noise levels within the SCRC are so low since the property is essentially undeveloped, haul truck noise along the interior site access road would be more audible to the closest sensitive receptors than haul truck trips that would occur on the heavily trafficked Mulholland Drive. Therefore, on-site truck noise would result in a significant impact, and implementation of mitigation measures NOISE-A and NOISE-B is required.

Off-site Construction Mobile Noise

For construction activities associated with Upper Stone Reservoir, haul trucks would travel on Mulholland Drive between the SCRC gate and I-405. The haul truck route includes road segments that pass adjacent to residences along Mulholland Drive, American Jewish University, and Stephen S. Wise Elementary School. Existing and project noise levels were calculated based on the FHWA RD-77-108 noise calculation formulas. Table 3.6-6 presents the estimated noise levels at sensitive receptors located along the haul route.

Table 3.6-6 Off-site Construction Haul Route Noise Levels

Sensitive Receptor	Existing Ambient (dBA, CNEL)	New Ambient (dBA, CNEL)	Increase
Residences along Mulholland Drive	70.0	72.5	2.5
American Jewish University	69.8	72.4	2.6
Stephen S. Wise Elementary School	69.8	72.4	2.6

Note: truck noise levels were adjusted by 2 dB to account for the roadway gradient.
Source: Terry A. Hayes Associates 2011.

As shown in Table 3.6-6, modeled existing noise levels were estimated to be around 69.8 dBA at each segment analyzed. Future ambient would be around 72.4. The haul route truck noise would not exceed the 5-dBA significance threshold. The proposed project would result in a less than significant impact related to off-site haul truck noise, and no mitigation is required.

NOISE-2 *Operation of the proposed project would not expose persons to noise levels in excess of City standards or create a substantial permanent increase in ambient noise levels.*

Vehicular Noise

The predominant noise source during project operation would be vehicular traffic attributed to the public access for passive recreation at the project site. LADWP operations on site would involve maintenance of the reservoir and ancillary elements at a similar level of activity as current operations. The proposed project would generate a maximum of 26 new morning and evening weekday peak hour trips. To determine off-site noise impacts, traffic was modeled under future year (2020) “without project” and “with project” conditions utilizing FHWA RD-77-108 noise calculation formulas. Results of the analysis are summarized in Table 3.6-7.

Table 3.6-7 Operational Vehicular Noise

Roadway Segment	Without Project (2020) dBA, CNEL	With Project (2020) dBA, CNEL	Increase
Mulholland Drive between Roscomare Road and Stone Canyon Road	67.6	67.8	0.2
Mulholland Drive between Stone Canyon Road and Nicada Drive	67.5	67.5	0.0

Source: Terry A. Hayes Associates 2011.

Mobile noise generated by operation of the proposed project would not cause the ambient noise level measured at the property line of the affected uses to increase by the 10-dBA threshold for operational mobile noise sources. Therefore, the proposed project would result in a less than significant impact from vehicular noise during project operation, and no mitigation is required.

Recreation Noise

Operation of the project site would include limited trails access within the SCRC. The closest sensitive receptors to outdoor activity areas include the residential land uses adjacent to the project site. Outdoor activity would be limited to hiking and similar passive uses that do not create substantial noise levels. The nearby sensitive uses would experience ambient noise level increases well below the 5-dBA threshold from outdoor activity. The impact would be less than significant, and no mitigation is required.

Parking Lot Noise

The project site would provide parking for approximately 25 vehicles located on the north end of SCRC. Automobile parking activity typically generates a noise level of approximately 58.1 dBA L_{eq} at 50 feet (e.g., tire noise, engine noise, and door slams).[1] The nearest sensitive receptor would be located approximately 800 feet northwest of the parking area. Based on distance attenuation of noise, parking activity would increase ambient noise levels by less than 1 dBA at the nearest sensitive receptor. Thus, the noise impact from parking lot activity would be less than significant.

NOISE-3 *Construction and operation of the proposed project would not expose people to excessive groundborne vibration.*

Construction

Table 3.6-8 indicates vibration levels associated with construction activities. On-site construction equipment would generate a vibration level of approximately 0.089 inches per second peak particle velocity at a distance of 25 feet. In addition, there would be added truck traffic along the construction haul route; however, truck vibration is not typically perceptible. The nearest residential structures to project construction activity would be approximately 650 feet from the internal site access road and would experience vibration levels less than 0.01 inches per second peak particle velocity. Vibration levels at these receptors would not exceed the potential building damage threshold of 0.3 inches per second. As such, the use of construction equipment would result in a less than significant vibration impact.

Table 3.6-8 Vibration Velocities for Construction Equipment

Equipment	Peak Particle Velocity at 25 feet (inches per second)[1]
Large Bulldozer	0.089
Loaded Trucks	0.076

[1] Fragile buildings can be exposed to ground-borne vibration levels of 0.3 inches per second peak particle velocity without experiencing structural damage.
Source: Federal Transit Administration 2006.

Operation

The proposed project would not include significant stationary sources of groundborne vibration, such as heavy equipment operations. Similar to existing conditions, project-related vibration levels would not be perceptible by sensitive receptors. Thus, operational vibration would result in a less than significant impact.

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[1] The reference parking noise level is based on a series of noise measurements completed 50 feet from vehicles in a multi-level parking structure.

3.6.5 Mitigation Measures

NOISE-A Traffic speeds on the interior site road shall be limited to 15 miles per hour or less.

NOISE-B Delivery and haul truck activity, with the exception of concrete deliveries, shall be limited to between the hours of 8:00 a.m. and 5:00 p.m. to minimize disruption to sensitive uses.

3.6.6 Significance After Mitigation

Construction

As discussed above, on-site construction activities would not generate noise levels in excess of City standards, and therefore, would not expose sensitive receptors to a substantial temporary increase in ambient noise levels. In addition, haul truck noise on Mulholland Drive would not exceed the City's standards. However, on-site construction haul truck noise would impact sensitive receptors located on Antelo Place and Roscomare Road. Implementation of mitigation measures NOISE-A and NOISE-B, although difficult to quantify, would reduce on-site haul truck noise. However, on-site haul truck noise would continue to exceed the 5-dBA significance threshold. There are no other feasible mitigation measures to reduce on-road haul truck noise from within the site. Sound barriers along these road segments would be infeasible because of site topography and the elevated location of the residential land uses. The on-site mobile noise impact would remain significant and unavoidable.

As discussed in NOISE-3 above, construction-generated groundborne vibration would not exceed acceptable levels. The impact would be less than significant.

Operation

As discussed above, both operational noise impacts and groundborne vibration impacts would be less than significant without the implementation of mitigation.

CHAPTER 3.7
TRANSPORTATION AND TRAFFIC

The scope of work for the traffic study was developed in conjunction with the City of Los Angeles Department of Transportation (LADOT). The assumptions, technical methodologies, and geographic coverage of the study area were identified as part of the study approach. The study, which analyzes the potential project-generated traffic impacts on the street system during construction and operation of the proposed project, assumes commencement of construction in 2015 and completion of construction in 2019. Roadway segment and intersection impacts are analyzed during both the peak phase of construction and during post-construction operations at the SCRC. A copy of the technical report is included in Appendix G.

3.7.1 Environmental Setting

A comprehensive data collection effort was undertaken to develop a detailed description of existing conditions within the study area. The assessment of conditions relevant to this study includes an inventory of the street system, including an identification of affected study intersections and roadway segments, operating conditions at the study intersections, and traffic volumes on the roadway segments.

In conjunction with LADOT, a total of five intersections were identified for analysis in the traffic study, including:

- Roscomare Road and Mulholland Drive
- Casiano Road and Mulholland Drive
- Skirball Center Drive and Mulholland Drive
- Skirball Center Drive and I-405 northbound on-/off- Ramps
- Skirball Center Drive and I-405 southbound on-/off- Ramps

All of the study intersections are signalized. The locations of the study intersections are shown in Figure 3.7-1, and the study intersection geometries and lane configurations are shown in Figure 3.7-2.

In addition, the following five roadway segments were identified for analysis in the traffic study (see Figure 3.7-1):

- Mulholland Drive between Nicada Drive & Stone Canyon Road
- Mulholland Drive between Woodcliff Road & Antelo Place
- Mulholland Drive between Roscomare Road & Casiano Road
- Skirball Center Drive between Mulholland Drive & I-405 northbound on-/off- Ramps
- Skirball Center Drive between I-405 northbound & southbound on-/off- Ramps

Local Roadway Characteristics

The following roadways in the vicinity of the project site were selected for inclusion as study area roadways in consultation with LADOT:

- Mulholland Drive

- Skirball Center Drive
- Roscomare Road
- Casiano Road

Mulholland Drive has two to three travel lanes with a divided centerline. Land uses in the project vicinity fronting Mulholland Drive include open space, residential uses, and the American Jewish University. On-street parking is generally prohibited on both sides of the roadway. The posted speed limit along this roadway ranges between 30 to 40 mph.

Skirball Center Drive is a 3-lane local roadway with a striped centerline that is parallel to I-405. I-405 on- and off-ramps intersect with this roadway. On-street parking is generally prohibited on both sides of Skirball Center Drive. There are no posted speed limits near the intersection with Mulholland Drive. A small Park and Ride lot is located south of the intersection with I-405 northbound on- and off-ramps.

Roscomare Road is a 2-lane collector roadway with a striped centerline. The posted speed limit is 25 mph. Residential land uses and limited small-scale commercial and public uses are located along Roscomare Road. On-street parking is generally permitted on the west side of the road.

Casiano Road is a 4-lane collector roadway that has a raised median or a striped center line as it transitions between different segments. The land uses fronting Casiano Road are residential, American Jewish University, and the Stephen S. Wise Temple. The posted speed limit is 25 mph. On-street parking is generally prohibited along both sides of this road.

Area Freeway Characteristics

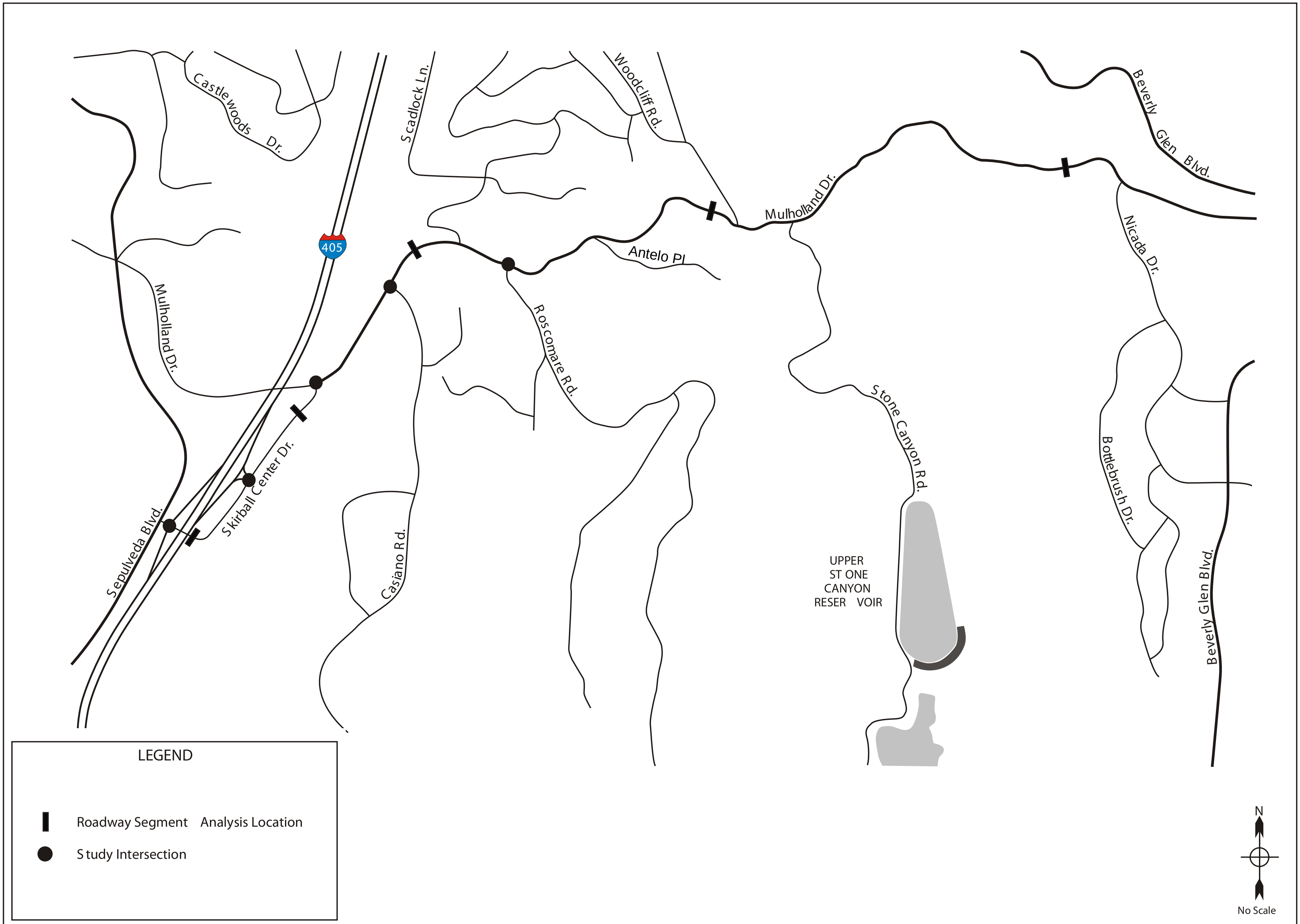
I-405 (San Diego Freeway) is a 10-lane north-south Interstate freeway located west of the project site. The freeway has a full-access interchange with Skirball Center Drive.

Existing Area Transit Services

The vicinity of the proposed project site is served by the County of Los Angeles Metropolitan Transportation Authority, which operates Line 761 between the San Fernando Valley and Westwood with a stop on Sepulveda Boulevard near Skirball Center Drive every 7 to 12 minutes during the weekday peak periods. Transit service is not provided along Mulholland Drive or Skirball Center Drive in the project vicinity.

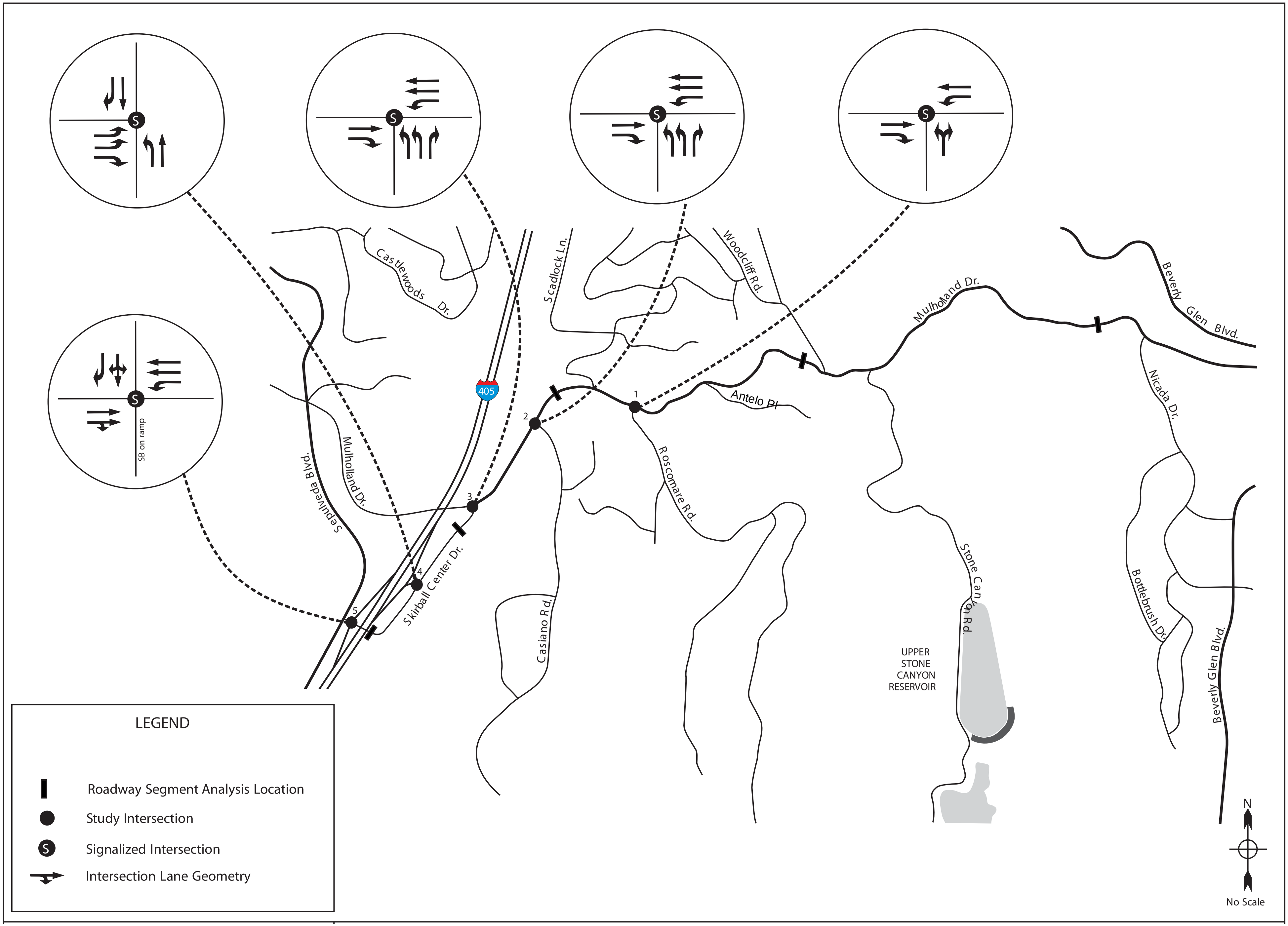
Existing Traffic Volumes and Levels of Service

The following discussion presents the existing peak hour turning movement traffic volumes for each of the study intersections and roadway segments analyzed in the traffic study, describes the methodology used to assess the traffic conditions at each intersection and roadway segment, and analyzes the resulting operating conditions at each intersection and roadway segment studied, indicating volume-to-capacity (V/C) ratios and levels of service (LOS).



Source: KOA Corporation 2011

Figure 3.7-1
Location of Study Intersection and Roadway Segments



Source: KOA Corporation 2011

Figure 3.7-2
Study Intersection Geometries

Level of Service Methodology

Measurements for operations are based on a ratio of average daily volume on a roadway segment or at an intersection versus the volume that is calculated to be the design capacity. The efficiency of traffic operations at a location is measured in terms of LOS. LOS measures average operating conditions during an hour. It is based on a V/C ratio, or delay. LOS ranges from A to F, with A representing excellent (free-flow) conditions and F representing extreme congestion. The delay at an intersection or on a street segment corresponds to a LOS value, which describes the segment operations. Roadway segments and intersections with vehicular volumes that are at or near capacity experience greater congestion and longer vehicle delays. Table 3.7-1 provides descriptions of general roadway operations for each LOS value, as defined within the 2000 *Highway Capacity Manual* (published by the Transportation Research Board).

Table 3.7-1 Level of Service Definitions

LOS	Flow Condition	V/C Ratio
A	LOS A describes primarily free-flow operations at average travel speeds, usually about 90 percent of the free-flow speed for the arterial classification. Vehicles are completely unimpeded in their ability to maneuver within the traffic stream. Stopped delay at signalized intersections is minimal.	0.00 - 0.60
B	LOS B represents reasonably unimpeded operations at average travel speeds, usually about 70 percent of the free-flow speed for the arterial classification. The ability to maneuver within the traffic stream is only slightly restricted and stopped delays are not bothersome. Drivers are not generally subjected to appreciable tension.	0.61 - 0.70
C	LOS C represents stable operations; however, the ability to maneuver and change lanes in mid-block locations may be more than at LOS B, and longer queues, adverse signal coordination, or both may contribute to lower average speeds of about 50 percent of the average free-flow speed for the arterial classification. Motorists will experience appreciable tension while driving.	0.71 - 0.80
D	LOS D borders on a range in which small increases in flow may cause a substantial increase in delay and hence decreases in arterial speed. LOS D may be due to adverse signal progression, inappropriate signal timing, high volumes, or some combination of these factors. Average travel speeds are about 40 percent for free-flow.	0.81 - 0.90
E	LOS E is characterized by significant delays and average travel speeds of one-third the free-flow speed or less. Such operations are caused by some combination of adverse progression, high signal density, high volumes, extensive delays at critical intersections, and inappropriate signal timing.	0.91 - 1.00
F	LOS F characterizes arterial flow at extremely low speeds below one-third to one-fourth of the free-flow speed. Intersection congestion is likely at critical signalized locations, with high delays and extensive queuing. Adverse progression is frequently a contributor to this condition.	Over 1.00

Existing Intersection Level of Service

Traffic counts were collected on Tuesday, May 25, and Wednesday, May 26, 2010. The daily totals were averaged together to create an average daily total.

Based on the traffic counts conducted at the study intersections, a LOS and the corresponding V/C ratio were determined for each of the study intersections. The Critical Movement Analysis (CMA) methodology, also known as the Circular 212 Planning methodology, was used to conduct these calculations. LADOT provided spreadsheets that were used to finalize the calculations. Table 3.7-2 provides the LOS and V/C values for 2010 existing conditions during the morning and evening peak periods.

Table 3.7-2 2010 Existing Weekday Intersection LOS

#	Study Intersection	Weekday AM Peak		Weekday PM Peak	
		V/C	LOS	V/C	LOS
1	Roscomare Road/Mulholland Drive	0.677	B	0.506	A
2	Casiano Road/Mulholland Drive	0.620	B	0.394	A
3	Skirball Center Drive/Mulholland Drive	0.888	D	0.640	B
4	Skirball Center Drive/I-405 Northbound Ramps	0.799	C	0.545	A
5	Skirball Center Drive /I-405 Southbound Ramps	0.621	B	0.503	A

Note: All study intersections are equipped with Automated Traffic Surveillance and Control (ATSAC) and Adaptive Traffic Control System (ATCS) capability. Per LADOT policies, a 0.100 V/C reduction has been applied to all calculations.
Source: KOA Corporation 2011.

As shown in Table 3.7-2, all of the study intersections are currently operating at LOS D or better during the weekday morning peak hours and LOS B or better during the weekday evening peak hours.

Existing Roadway Segment Volumes

Traffic counts for the study roadway segments were conducted in May 2010. A summary of the average daily traffic volumes is shown in Table 3.7-3.

Table 3.7-3 2010 Existing Weekday Roadway Segment Volumes

Study Roadway Segment	Daily Volumes[1]
Mulholland Drive between Nicada Drive & Stone Canyon Road	13,801
Mulholland Drive between Woodcliff Road & Antelo Place	12,006
Mulholland Drive between Roscomare Road & Casiano Road	14,976
Skirball Center Drive between Mulholland Drive & I-405 NB Ramps	20,234
Skirball Center Drive between I-405 SB & NB Ramps	14,309

[1] Volumes represent the total daily vehicle trips counted in a 24-hour period.
Source: KOA Corporation 2011.

As shown in Table 3.7-3, the highest daily vehicle volumes occur on Skirball Center Drive between Mulholland Drive and the I-405 northbound on- and off-ramps.

Los Angeles County Congestion Management Program

The Congestion Management Program (CMP) was created statewide as a result of Proposition 111 and has been implemented locally by the Metropolitan Transportation Authority. The CMP requires that the traffic impact of individual projects of potential regional significance be analyzed. The CMP system comprises a specific set of arterial roadways and all freeways. A total of 164 arterial intersections are identified for monitoring on the system in Los Angeles County. The nearest CMP mainline freeway monitoring location to the project site is I-405. In addition, the I-405 on- and off-ramps in the project area and the intersection of Ventura Boulevard at Sepulveda Boulevard are nearby CMP arterial monitoring locations.

3.7.2 Environmental Impacts

Methodology

The transportation and traffic impact analysis is based on the following approach:

- **Existing Conditions:** The analysis of 2010 existing traffic conditions provides a basis for the remainder of the study. The existing conditions analysis includes an assessment of streets, intersections, traffic volumes, and operating conditions.

- **Future Without Project Conditions:** Future traffic conditions are projected without the proposed project during the peak phase of construction (2019) and during project operation (2020). The objective of this portion of the analysis is to predict future traffic growth and operating conditions that could be expected to result from growth in the vicinity of the project site in order to provide an appropriate baseline condition upon which to base the analysis of potential project impacts.

- **Future With Project Conditions:** This is an analysis of future traffic conditions with the traffic expected during the peak phase of construction (phase of construction involving the greatest number of vehicle trips to and from the site), which would occur during Phase 4 in 2019, added to the predicted future base traffic forecasts without the proposed project. Similarly, for post-construction project operation, the analysis includes traffic expected to be generated during peak use of the proposed recreational facilities combined with predicted future background traffic in the area. Thus, the impacts of the proposed project on future traffic conditions can then be identified.

- **2008 Baseline With Project Conditions:** To also incorporate analysis consistent with recent CEQA case law, this analysis considers traffic conditions based on a 2008 baseline (when the proposed project NOP was issued) with the addition of traffic expected during the peak phase of construction (phase of construction involving the greatest number of vehicle trips to and from the site), which would occur during Phase 4. Similarly, for post-construction project operation, this analysis includes traffic expected to be generated during peak use of the proposed trails element when combined with 2008 baseline traffic in the area.

Thresholds of Significance

As part of the Initial Study (see Appendix A), it was determined that neither the construction nor operation of the proposed project would result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks; result in inadequate emergency access; or conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks). Accordingly, these issues are not further analyzed in the EIR.

The CEQA Guidelines establish that a proposed project would have a significant effect on transportation and traffic if it would:

- Conflict with an applicable plan, ordinance, or policy for establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, street segments, highways and freeways, pedestrian and bicycle paths, and mass transit;

- Conflict with an applicable congestion management program, including, but not limited to level of service standards established by the county congestion management agency for designated roads or highways;

- Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment); or

- Result in inadequate parking capacity.

Traffic impacts are identified if the proposed project would result in a significant change in traffic conditions at a study intersection or roadway segment. LADOT has established specific thresholds for project-related increases in the V/C of signalized study intersections, as shown in Table 3.7-4 below.

Table 3.7-4 LADOT Signalized Intersection Thresholds

LOS	Final V/C	Project-Related V/C Increase
C	< 0.70 – 0.80	Equal to or greater than 0.040
D	< 0.80 – 0.90	Equal to or greater than 0.020
E and F	0.90 or more	Equal to or greater than 0.010

Note: Final V/C is the V/C ratio at an intersection, considering impacts from the project and without proposed traffic impact mitigations.

Based on LADOT guidance, significant impacts related to the roadway segments were defined based on the worsening of conditions at any segment with a final LOS of E or F if the project share of the total traffic volume is one percent or greater.

In conformance with the CMP Transportation Impact Analysis Guidelines, a traffic impact analysis was conducted at:

- CMP arterial monitoring intersections, including freeway on-ramps or off-ramps, where the project would add 50 or more vehicles during either the morning or afternoon weekday peak hours.
- CMP mainline freeway monitoring locations where the project would add 150 or more trips, in either direction, during either the morning or afternoon weekday peak hours.

Impact Analysis

TRANS-1 *The proposed project would conflict with an applicable plan, ordinance, or policy for establishing measures of effectiveness for the performance of the circulation system at study intersections and on study roadway segments during construction.*

Construction

Impacts to the study intersections and roadway segments during construction were determined by comparing “future without project” conditions to “future with project” conditions. Phase 4 of construction is anticipated to require the greatest number of vehicle trips. Phase 4 is anticipated to occur in 2019, and this forms the basis for the traffic analysis for construction activities associated with the proposed project.

Future Without Project Conditions

To evaluate the potential impact of construction of the proposed project on local traffic conditions, it is necessary to develop a forecast of future traffic volumes in the study area under conditions without the proposed project. This provides a basis against which to measure the potential significant impacts of the proposed project. Future traffic growth is made up of ambient traffic growth and cumulative project growth, which are described below.

Ambient Traffic Growth is traffic growth that would occur in the study area due to general employment growth, housing growth, and growth in regional through trips in Southern California. Even if there is no change in housing or employment in the region, it is anticipated there will be some background (ambient) traffic growth. In order to forecast baseline traffic volumes for the future without project traffic volumes in the year 2019, year-2010 peak-hour traffic count volumes from the existing conditions scenario were increased by an ambient growth rate of 1 percent per year (a compounded factor of 1.0937). The application of these annual rates is consistent with sub-regional traffic growth data defined by the CMP guidelines.

Cumulative Project Growth is due to specific, known development projects in the vicinity that may affect traffic circulation in the study area. A list of past, present, and reasonably foreseeable future development projects occurring within the area was developed in conjunction with LADOT. A 2-mile radius line from Upper Stone Reservoir was used to define a capture area for approved and pending projects (cumulative projects). A total of nine projects were identified. The related projects for the purposes of the traffic analysis are listed in Table 3.7-5 below.

Table 3.7-5 Cumulative Project List for Traffic

Location	Description
4805 North Sepulveda Boulevard	465 apartment units and 55,000 sf supermarket/retail
15821 Ventura Boulevard	6,400 sf bank
15739 Ventura Boulevard	259 student preschool, 23,340 sf synagogue
15222 Ventura Boulevard	52 condominiums, 7,460 sf retail
4454 Van Nuys Boulevard	98 apartment units, 1,090 sf retail
14845 Ventura Boulevard	55,000 sf supermarket, 6,020 sf bank
14478 Ventura Boulevard	392 sf gas station
14121 Ventura Boulevard	88 condominiums, 6,000 sf retail, 3,500 sf fast-food restaurant
14049 Ventura Boulevard	27,839 sf supermarket

Source: KOA Corporation 2011.

To analyze future conditions (2019) without the proposed project, intersection turn volumes with ambient growth and trips generated by cumulative projects were calculated using the same methodology used for the existing conditions analysis. Table 3.7-6 shows the future without project LOS calculations for the study intersections.

Table 3.7-6 Future Without Project (2019) Study Intersection LOS

#	Study Intersection	Weekday AM Peak		Weekday PM Peak	
		V/C	LOS	V/C	LOS
1	Roscomare Road/Mulholland Drive	0.762	C	0.584	A
2	Casiano Road/Mulholland Drive	0.699	B	0.459	A
3	Skirball Center Drive/Mulholland Drive	0.990	E	0.730	C
4	Skirball Center Drive/I-405 Northbound Ramps	0.886	D	0.612	B
5	Skirball Center Drive /I-405 Southbound Ramps	0.698	B	0.575	A

Note: All study intersections are equipped with ATSAC and ATCS capability. Per LADOT policies, a 0.100 V/C reduction has been applied to all calculations.
Source: KOA Corporation 2011.

As shown in Table 3.7-6 above, most of the study intersections would continue to operate at LOS D or better during the weekday peak hours. However, the intersection of Skirball Center Drive at Mulholland Drive would operate at LOS E in the future (2019) without project conditions. In addition, the future conditions (2019) without the proposed project on study roadway segments volumes were calculated. Table 3.7-7 shows the future roadway segment volumes without the proposed project.

Table 3.7-7 Future Without Project (2019) Weekday Roadway Segment Volumes

Study Roadway Segment	Existing Daily Volumes	Future Daily Volumes
Mulholland Drive between Nicada Drive & Stone Canyon Road	13,801	15,722
Mulholland Drive between Woodcliff Road & Antelo Place	12,006	13,758
Mulholland Drive between Roscomare Road & Casiano Road	14,976	17,007
Skirball Center Drive between Mulholland Drive & I-405 NB Ramps	20,234	22,757
Skirball Center Drive between Skirball Center Drive & I-405 SB Ramps	14,309	15,968

Source: KOA Corporation 2011.

As shown in Table 3.7-7, the highest daily vehicle volumes in 2019 would continue to occur on Skirball Center Drive between Mulholland Drive and the I-405 northbound on- and off-ramps without the proposed project.

Project Construction Trip Generation Forecasts

To evaluate the worst-case scenario for construction trip generation, the phase of construction anticipated to generate the greatest amount of vehicle trips was used in this impact analysis (Phase 4). To determine trip generation during construction, it is assumed that each employee would drive to and from work without carpooling. In converting trucks to passenger car equivalents, a factor of 2.5 was assumed. This factor is consistent with other studies that include trips generated by trucking activities and is based on the most conservative factor defined by the Southern California Association of Governments Heavy Duty Truck Model.

The proposed project would be constructed in five phases over a period of approximately 4 years. Trip generation for employees and trucks would vary depending on the phase of construction. As discussed above, Phase 4 would generate the greatest number of vehicle trips between employee trips and truck deliveries. The trip generation calculations are shown in Table 3.7-8.

Table 3.7-8 Construction Daily Peak One-Way Trip Generation Calculations

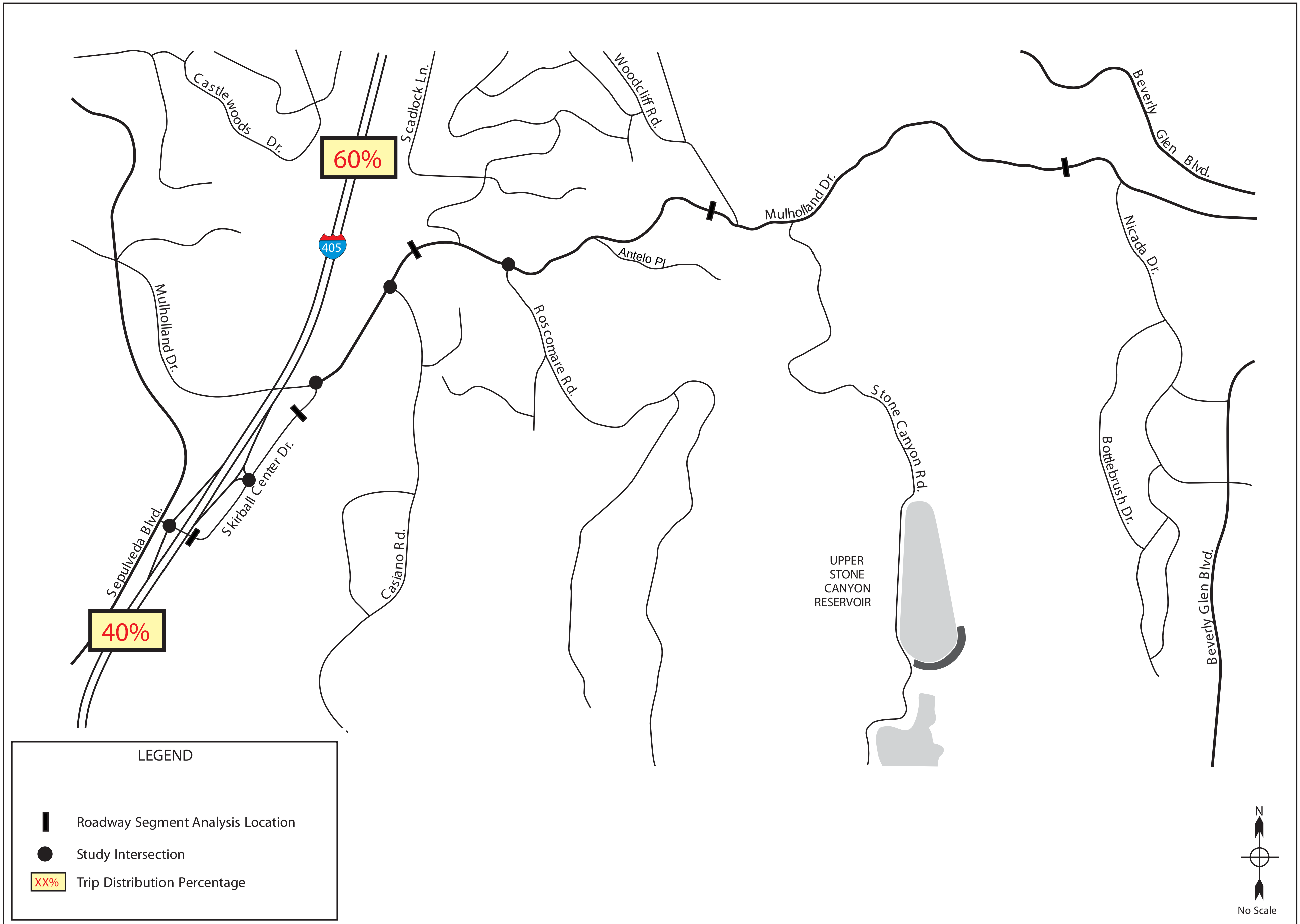
Generator	Daily	Weekday AM Total	Weekday AM In	Weekday AM Out	Weekday PM Total	Weekday PM In	Weekday PM Out
Employee[1]	94	47	47	0	47	0	47
Delivery Truck[2]	815	102	51	51	102	51	51
Total	909	149	98	51	149	51	98

[1] Employee trips = 1 employee per vehicle
[2] Delivery truck trips = 2.5 passenger car equivalent X truck trips
Source: KOA Corporation 2011.

The number of employee trips was based on the assumption that all 47 employees would arrive within the morning peak hour and depart within the evening peak hour. The number of truck trips was based on a typical 8-hour shift, with delivery truck trips distributed evenly throughout the day. Based on a daily total of 815 delivery truck trips (326 truck trips at the 2.5 passenger car equivalent factor), 102 delivery truck trips would occur during both the morning and evening peak hours. The total construction trip generation for work at Upper Stone Reservoir would be 909 daily trips, of which 149 trips would occur during each of the peak periods.

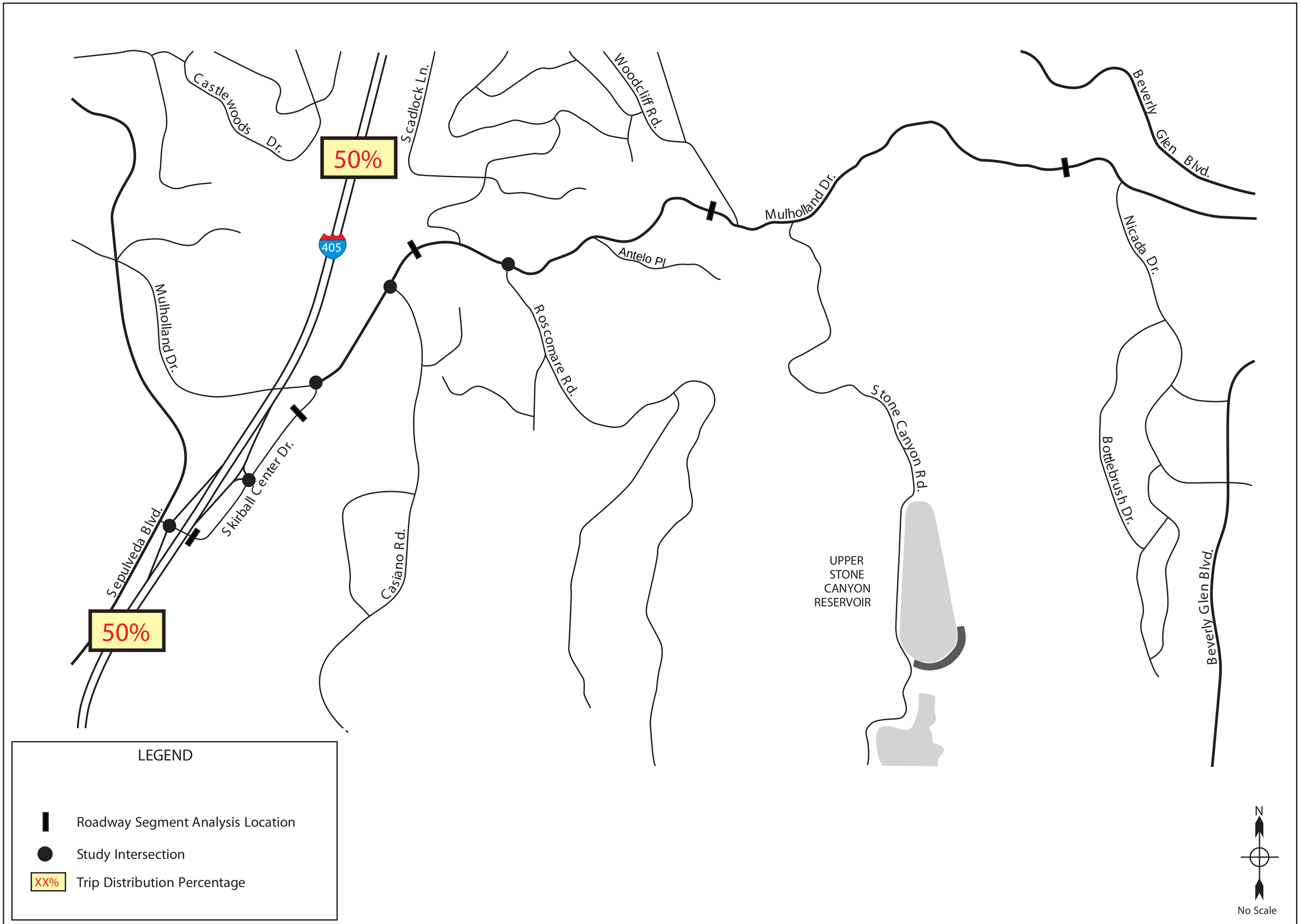
Project Construction Trip Distribution Assumptions

Figures 3.7-3 and 3.7-4 show the trip distribution patterns for construction vehicles and worker trips, respectively. The distribution of construction truck trips was assumed to be freeway-oriented, with 60 percent of the trips distributed to I-405 north and 40 percent to I-405 south. The construction trip distribution assumption was based on some truck trips coming from the San Fernando Valley and points northward (approximately 60 percent) and the rest of the construction trip trips coming from the South Bay and San Pedro/Long Beach port industrial areas (approximately 40 percent), as recommended by LADOT. Due to left-turn prohibitions into the SCRC driveway from Mulholland Drive traveling westbound, the distribution pattern for employee trips was assumed to be primarily freeway-oriented with 50 percent of the trips distributed to I-405 north and 50 percent to I-405 south.



Source: KOA Corporation 2011

Figure 3.7-3
Construction Truck Trip Distribution



Source: KOA Corporation 2011

Figure 3.7-4
Worker Trip Distribution

Project Intersection Analysis

Table 3.7-9 provides a summary of intersection impact analysis in 2019 for the proposed project during the morning peak period. Table 3.7-10 shows the intersection impact analysis during the evening peak period. Traffic impacts created during project construction were calculated by subtracting the V/C ratios under the Future Without Project heading from the totals under the Future With Project heading. The LOS calculation worksheets for this analysis are provided in Appendix G.

Table 3.7-9 Future With Project Construction (2019) Study Intersection LOS – AM Peak Hour

#	Intersection	2010		Future Without Project (2019)		Future With Project (2019)		Diff.	Sig. Impact?
		V/C	LOS	V/C	LOS	V/C	LOS		
1	Roscomare Road/Mulholland Drive	0.677	B	0.762	C	0.832	D	0.070	YES
2	Casiano Road/Mulholland Drive	0.620	B	0.699	B	0.769	C	0.070	YES
3	Skirball Center Drive/Mulholland Drive	0.888	D	0.990	E	1.025	F	0.035	YES
4	Skirball Center Drive/I-405 Northbound Ramps	0.799	C	0.886	D	0.915	E	0.029	YES
5	Skirball Center Drive /I-405 Southbound Ramps	0.621	B	0.698	B	0.750	C	0.052	YES

Note: All study intersections are equipped with ATSAC and ATCS capability. Per LADOT policies, a 0.100 V/C reduction has been applied to all calculations.
Source: KOA Corporation 2011.

Table 3.7-10 Future With Project Construction (2019) Study Intersection LOS – PM Peak Hour

#	Intersection	2010		Future Without Project (2019)		Future With Project (2019)		Diff.	Sig. Impact?
		V/C	LOS	V/C	LOS	V/C	LOS		
1	Roscomare Road/Mulholland Drive	0.506	A	0.584	A	0.652	B	0.068	NO
2	Casiano Road/Mulholland Drive	0.394	A	0.459	A	0.496	A	0.037	NO
3	Skirball Center Drive/Mulholland Drive	0.640	B	0.730	C	0.798	C	0.068	YES
4	Skirball Center Drive/I-405 Northbound Ramps	0.545	A	0.612	B	0.649	B	0.037	NO
5	Skirball Center Drive /I-405 Southbound Ramps	0.503	A	0.575	A	0.628	B	0.053	NO

Note: All study intersections are equipped with ATSAC and ATCS capability. Per LADOT policies, a 0.100 V/C reduction has been applied to all calculations.
Source: KOA Corporation 2011.

As shown in Table 3.7-9, construction of the proposed project would create significant impacts at all five of the study intersections during the morning peak period. As shown in Table 3.7-10, construction of the proposed project would create a significant impact at the intersection of Skirball Center Drive and Mulholland Drive during the evening peak period.

Phase 4 of construction is anticipated to require the greatest number of vehicle trips. For the purposes of providing a conservative impact analysis, Phase 4 was used above to project the greatest amount of vehicle traffic that would be expected during the entire construction period. However, Phase 4 would occur near the end of project construction and is anticipated to take only two months to complete because it consists of backfilling behind the retaining walls and covering the top of reservoir with topsoil. The peak number of truck trips that would occur during this phase is associated with the delivery of topsoil to the project site. However, because Phase 4 occurs near the end of project construction, it is not unrealistic to assume that the time allotted for this task could be doubled in duration from 2 to 4 months to reduce the average daily number of delivery truck trips by half. Table 3.7-11 shows the trip generation assumptions for doubling the construction period for Phase 4, referred to as Phase 4 Alternative Scenario A (Double Construction Schedule).

Table 3.7-11 Construction Daily One-Way Trip Generation Calculations – Phase 4 Alternative Scenario A (Double Construction Schedule)

Generator	Daily	Weekday AM Total	Weekday AM In	Weekday AM Out	Weekday PM Total	Weekday PM In	Weekday PM Out
Employee[1]	94	47	47	0	47	0	47
Delivery Truck[2]	408	50	25	25	50	25	25
Total	*502*	*97*	*72*	*25*	*97*	*25*	*72*

[1] Employee trips = 1 employee per vehicle
[2] Delivery truck trips = 2.5 passenger car equivalent X truck trips
Source: KOA Corporation 2011.

Under Phase 4 Alternative Scenario A (Double Construction Schedule), the total construction trip generation for work at Upper Stone Reservoir would be 502 daily trips (163 truck trips at the 2.5 passenger car equivalent factor plus 94 employee commute trips), of which 97 trips would occur during each of the peak periods. Using the same trip distribution patterns as assumed above, the study intersection impacts were calculated. Tables 3.7-12 and 3.7-13 summarize the intersection impact analysis in 2019 for Phase 4 Alternative Scenario A (Double Construction Schedule) during the morning and evening peak periods, respectively.

Table 3.7-12 Future With Phase 4 Alternative Scenario A (Double Construction Schedule) Construction (2019) Study Intersection LOS – AM Peak Hour

#	Intersection	2010		Future Without Project (2019)		Future With Project (2019)		Diff.	Sig. Impact?
		V/C	LOS	V/C	LOS	V/C	LOS		
1	Roscomare Road/Mulholland Drive	0.677	B	0.762	C	0.812	D	0.050	YES
2	Casiano Road/Mulholland Drive	0.620	B	0.699	B	0.750	C	0.051	YES
3	Skirball Center Drive/Mulholland Drive	0.888	D	0.990	E	1.008	F	0.018	YES
4	Skirball Center Drive/I-405 Northbound Ramps	0.799	C	0.886	D	0.905	E	0.019	YES
5	Skirball Center Drive /I-405 Southbound Ramps	0.621	B	0.698	B	0.732	C	0.034	NO

Note: All study intersections are equipped with ATSAC and ATCS capability. Per LADOT policies, a 0.100 V/C reduction has been applied to all calculations.
Source: KOA Corporation 2011.

Table 3.7-13 Future With Phase 4 Alternative Scenario A (Double Construction Schedule) Construction (2019) Study Intersection LOS – PM Peak Hour

#	Intersection	2010		Future Without Project (2019)		Future With Project (2019)		Diff.	Sig. Impact?
		V/C	LOS	V/C	LOS	V/C	LOS		
1	Roscomare Road/Mulholland Drive	0.506	A	0.584	A	0.635	B	0.051	NO
2	Casiano Road/Mulholland Drive	0.394	A	0.459	A	0.477	A	0.018	NO
3	Skirball Center Drive/Mulholland Drive	0.640	B	0.730	C	0.781	C	0.051	YES
4	Skirball Center Drive/I-405 Northbound Ramps	0.545	A	0.612	B	0.639	B	0.027	NO
5	Skirball Center Drive /I-405 Southbound Ramps	0.503	A	0.575	A	0.609	B	0.034	NO

Note: All study intersections are equipped with ATSAC and ATCS capability. Per LADOT policies, a 0.100 V/C reduction has been applied to all calculations.
Source: KOA Corporation 2011.

As shown in Tables 3.7-12 and 3.7-13, Phase 4 Alternative Scenario A (Double Construction Schedule) would eliminate the significant construction impact at the intersection of I-405 southbound on- and off-ramps at Skirball Center Drive during the morning peak period. All other study intersections impacts, including the evening peak period impact at the intersection of Skirball Center Drive at Mulholland Drive would remain significant. The LOS calculation worksheets for this analysis are included in Appendix G.

If the construction schedule in Phase 4 were extended from 2 months to 4 months, as described in Phase 4 Alternative Scenario A (Double Construction Schedule) above, this phase would no longer represent the peak phase of construction. Instead, the peak number of workers combined with truck deliveries to the project site would occur in Phase 3 of construction in 2017. Therefore, an intersection impact analysis was also conducted for Phase 3. Table 3.7-14 shows the trip generation assumptions for Phase 3 of construction.

Table 3.7-14 Construction Daily One-Way Trip Generation Calculations – Phase 3

Generator	Daily	Weekday AM Total	Weekday AM In	Weekday AM Out	Weekday PM Total	Weekday PM In	Weekday PM Out
Employee[1]	214	107	107	0	107	0	107
Delivery Truck[2]	285	35	18	17	35	18	17
Total	*499*	*142*	*125*	*17*	*142*	*18*	*124*

[1] Employee trips = 1 employee per vehicle
[2] Delivery truck trips = 2.5 passenger car equivalent X truck trips
Source: KOA Corporation 2011.

During Phase 3, the total construction trip generation for work at Upper Stone Reservoir would be 499 daily trips (114 trucks at the 2.5 passenger car equivalent factor plus 214 employee commute trips), of which approximately 142 trips would occur during each of the peak periods. Although there are substantially fewer truck trips associated with Phase 3 when compared to Phase 4, because a high proportion of the total vehicle trips consists of worker commute trips (which are assumed to all occur during the peak periods), the total number of peak period trips is only slightly reduced from Phase 4. However, because Phase 3 would occur in the year 2017, there is less assumed ambient background growth in the calculation of future traffic volumes without the proposed project compared to 2019 (when Phase 4 would occur). Using the same trip distribution patterns as assumed above, the study intersection impacts were calculated. Tables 3.7-15 and 3.7-16 summarize the intersection impact analysis in 2017 for Phase 3 during the morning and evening peak periods, respectively. The LOS calculation worksheets for this analysis are provided in Appendix G.

Table 3.7-15 Future With Phase 3 Construction (2017) Study Intersection LOS – AM Peak Hour

#	Intersection	2010		Future Without Project (2017)		Future With Project (2017)		Diff.	Sig. Impact?
		V/C	LOS	V/C	LOS	V/C	LOS		
1	Roscomare Road/Mulholland Drive	0.677	B	0.745	C	0.833	D	0.088	YES
2	Casiano Road/Mulholland Drive	0.620	B	0.684	B	0.771	C	0.087	YES
3	Skirball Center Drive/Mulholland Drive	0.888	D	0.969	E	1.010	F	0.041	YES
4	Skirball Center Drive/I-405 Northbound Ramps	0.799	C	0.866	D	0.893	D	0.027	YES
5	Skirball Center Drive /I-405 Southbound Ramps	0.621	B	0.682	B	0.732	C	0.050	YES

Note: All study intersections are equipped with ATSAC and ATCS capability. Per LADOT policies, a 0.100 V/C reduction has been applied to all calculations.
Source: KOA Corporation 2011.

Table 3.7-16 Future With Phase 3 Construction (2017) Study Intersection LOS – PM Peak Hour

#	Intersection	2010		Future Without Project (2017)		Future With Project (2017)		Diff.	Sig. Impact?
		V/C	LOS	V/C	LOS	V/C	LOS		
1	Roscomare Road/Mulholland Drive	0.506	A	0.571	A	0.658	B	0.087	NO
2	Casiano Road/Mulholland Drive	0.394	A	0.449	A	0.461	A	0.012	NO
3	Skirball Center Drive/Mulholland Drive	0.640	B	0.715	C	0.802	D	0.087	YES
4	Skirball Center Drive/I-405 Northbound Ramps	0.545	A	0.599	A	0.641	B	0.042	NO
5	Skirball Center Drive /I-405 Southbound Ramps	0.503	A	0.562	A	0.612	B	0.050	NO

Note: All study intersections are equipped with ATSAC and ATCS capability. Per LADOT policies, a 0.100 V/C reduction has been applied to all calculations.
Source: KOA Corporation 2011.

As shown in Tables 3.7-15 and 3.7-16, construction traffic for Phase 3 in 2017 would also create significant impacts at all of the study intersections during the morning peak period and the intersection of Skirball Center Drive at Mulholland Drive during the evening peak hour. The impact to the study intersections would be significant.

Implementation of mitigation measures TRANS-A and TRANS-B is required to minimize intersection impacts and reduce construction vehicle traffic under the scenarios described above.

Project Roadway Segment Analysis

Peak hour traffic impacts were analyzed at the study roadway segments to determine potential significant impacts during project construction at these locations. Table 3.7-17 summarizes the peak-hour volumes from the daily counts. It should be noted that the peak-hour volumes may not necessarily occur during the typical peak-hour periods between 7:00 a.m. to 9:00 a.m. and between 4:00 p.m. to 6:00 p.m. As shown in Table 3.7-17, Skirball Center Drive between Mulholland Drive and the I-405 northbound ramps would have the highest percentage of daily vehicle trips during project construction.

Based on the results shown in Table 3.7-17, all of the analyzed roadway segments would operate at LOS E or F, except on Skirball Center Drive between the northbound and southbound ramp I-405 ramps, which would operate at LOS B.

Construction trips were not assumed to travel east of the project site. Therefore, the roadway segment on Mulholland Drive between Nicada Drive and Stone Canyon Road would not be significantly impacted. However, three out of four roadway segments operating at LOS E or F under future base conditions would be significantly impacted by the proposed project due to worsening of operations at these locations during construction. These roadway segments include:

- Mulholland Drive, between Woodcliff Road and Antelo Place
- Mulholland Drive, between Roscomare Road and Casiano Road
- Skirball Center Drive, between Mulholland Drive and I-405 northbound on/off ramps

The decrease in LOS to E and F during construction would result in a significant impact. Implementation of mitigation measures TRANS-A and TRANS-B is required.

Table 3.7-17 Future With Project Construction (2019) Peak Hour Weekday Roadway Segment Volumes

Study Roadway Segment	Base Volumes								Proposed Project				
	2010			Ambient Growth	Area Projects	Future Base			Construction Only	Future With Construction			
	Volume	V/C	LOS			Volume	V/C	LOS		Volume	V/C	LOS	% Share
Mulholland Drive between Nicada Drive & Stone Canyon Road	1,338	1.070	F	9%	58	1,521	1.217	F	0	1,521	1.217	F	0.0
Mulholland Drive between Woodcliff Road & Antelo Place	1,225	0.980	E	9%	58	1,397	1.118	F	149	1,546	1.237	F	6.6
Mulholland Drive between Roscomare Road & Casiano Road	1,564	0.834	D	9%	58	1,768	0.943	E	149	1,917	1.022	F	5.3
Skirball Center Drive between Mulholland Drive & I-405 NB Ramps	1,999	0.799	C	9%	58	2,244	0.898	D	149	2,393	0.957	E	4.0
Skirball Center Drive between I-405 SB and NB Ramps	1,386	0.554	A	9%	37	1,553	0.621	B	75	1,628	0.651	B	2.8

Source: KOA Corporation 2011.

2008 Baseline with Project Conditions

This is an analysis of traffic conditions with the traffic expected during the peak phase of construction (Phase 4) added to baseline traffic volumes in year 2008. This analysis does not take into account future background traffic volumes (ambient growth) or related project traffic at the time the project vehicle trips would be expected to occur in the future, 2019 for construction and 2020 for project operation, as provided above.

The NOP was issued in 2008, establishing the baseline year for project analysis. However, due to refinements in the project concept plan, peak-hour study intersection counts and daily roadway segment counts were collected in May 2010, and these were used for the project impact analysis presented above. Daily roadway segment counts were collected in September 2008. In order to define baseline year 2008 conditions for the study intersections, a factor of 1.0152 was utilized to increase the lower year 2010 intersection counts to year 2008 conditions based on the difference in volume between the 2008 and 2010 roadway segment counts.

The project traffic volumes for this analysis were based on the project trip generation and trip distribution assumptions discussed above. The significant impact thresholds were based on the same LADOT guidelines that were applied to the future year project analysis above. The study intersection operations for the 2008 baseline plus proposed project are summarized in Table 3.7-18 for the morning peak hour and Table 3.7-19 for the evening peak-hour. Traffic impacts created by the project construction under this scenario were calculated by subtracting the V/C totals under the 2008 conditions from the totals under the 2008 baseline with project construction conditions. The LOS calculation worksheets for this analysis are provided in Appendix G.

Table 3.7-18 2008 Baseline With Phase 4 Construction Study Intersection LOS – AM Peak Hour

#	Intersection	2008		2008 Baseline With Project		Diff.	Sig. Impact?
		V/C	LOS	V/C	LOS		
1	Roscomare Road/Mulholland Drive	0.688	B	0.758	C	0.070	YES
2	Casiano Road/Mulholland Drive	0.631	B	0.701	C	0.070	YES
3	Skirball Center Drive/Mulholland Drive	0.903	E	0.938	E	0.035	YES
4	Skirball Center Drive/I-405 Northbound Ramps	0.813	D	0.843	D	0.030	YES
5	Skirball Center Drive /I-405 Southbound Ramps	0.632	B	0.684	B	0.052	NO

Note: All study intersections are equipped with ATSAC and ATCS capability. Per LADOT policies, a 0.100 V/C reduction has been applied to all calculations.
Source: KOA Corporation 2011.

Table 3.7-19 2008 Baseline With Phase 4 Construction Study Intersection LOS – PM Peak Hour

#	Intersection	2008		2008 Baseline With Project Construction		Diff.	Sig. Impact?
		V/C	LOS	V/C	LOS		
1	Roscomare Road/Mulholland Drive	0.515	A	0.583	A	0.068	NO
2	Casiano Road/Mulholland Drive	0.402	A	0.439	A	0.037	NO
3	Skirball Center Drive/Mulholland Drive	0.651	B	0.719	C	0.068	YES
4	Skirball Center Drive/I-405 Northbound Ramps	0.555	A	0.592	A	0.037	NO
5	Skirball Center Drive /I-405 Southbound Ramps	0.512	A	0.565	A	0.053	NO

Note: All study intersections are equipped with ATSAC and ATCS capability. Per LADOT policies, a 0.100 V/C reduction has been applied to all calculations.
Source: KOA Corporation 2011.

As shown in Tables 3.7-18 and 3.7-19, construction traffic for Phase 4 added to 2008 baseline conditions would create significant impacts at most of the study intersections during the morning peak period and the intersection of Skirball Center Drive at Mulholland Drive during the evening peak hour. One fewer study intersection (Skirball Center Drive at I-405 southbound ramps) would be impacted during the morning peak hour than in the future with project scenarios presented above. The impact to the study intersections would be significant. Implementation of mitigation measures TRANS-A and TRANS-B is required to minimize intersection impacts and reduce construction vehicle traffic.

Baseline traffic impacts at the study roadway segments were also analyzed to determine potential significant impacts at these locations. Table 3.7-20 summarizes the peak-hour volumes from the daily counts. It should be noted that the peak-hour volumes may not necessarily occur during the typical peak-hour periods between 7:00 a.m. to 9:00 a.m. and between 4:00 p.m. to 6:00 p.m.

Table 3.7-20 2008 Baseline With Project Construction Peak Hour Weekday Roadway Segment Volumes

Study Roadway Segment	2008			Construction Only	2008 Baseline With Project Construction			
	Volume	V/C	LOS		Volume	V/C	LOS	% Share
Mulholland Drive between Nicada Drive & Stone Canyon Road	1,358	1.086	F	0	1,358	1.086	F	0.0
Mulholland Drive between Woodcliff Road & Antelo Place	1,243	0.994	E	149	1,392	1.114	F	7.5
Mulholland Drive between Roscomare Road & Casiano Road	1,588	0.847	D	149	1,737	0.926	E	6.0
Skirball Center Drive between Mulholland Drive & I-405 NB Ramps	2,029	0.812	D	149	2,178	0.871	D	4.4
Skirball Center Drive between I-405 SB and NB Ramps	1,407	0.563	A	75	1,482	0.593	A	3.1

Source: KOA Corporation 2011.

Based on the results shown Table 3.7-20, three of the analyzed roadway segments would operate at LOS E or F. Construction trips were not assumed to travel east of the project site. Therefore, the roadway segment on Mulholland Drive between Nicada Drive and Stone Canyon Road would not be impacted. However, two out of three roadway segments operating at LOS E or F under 2008 baseline with project construction conditions would be significantly impacted by the proposed project due to worsening of operations at these locations during project construction. These roadway segments include:

- Mulholland Drive, between Woodcliff Road and Antelo Place
- Mulholland Drive, between Roscomare Road and Casiano Road

The decrease in LOS to E and F during construction would result in a significant impact. Implementation of mitigation measures TRANS-A and TRANS-B is required.

Operations

At completion of construction of the buried reservoir, the new water storage facilities would not create the need for LADWP personnel to be located permanently on site. LADWP activities would continue to involve maintenance at a similar level of activity as currently occurs at Upper Stone Reservoir. Recreation functions at the project site related to trails access would be available to the public during daylight hours only. A gate would be installed along the main access road to the SCRC from Mulholland Drive that would be opened at dawn and closed at dusk. The parking lot for the recreation function would accommodate approximately 25 vehicles.

Recreation Trip Generation Analysis

In order to assess potential environmental impacts related to public access at the SCRC, several assumptions have been made as follows regarding the anticipated level of visitor use of the trails system based on a maximum number of 25 parking spaces. The level of use would vary between weekend days and weekdays. Given the nature and size of the proposed trails elements, visitors would be expected to stay approximately 1 to 2 hours at the SCRC, and there would be a turnover of visitors leaving and entering the site during the day. Based on such factors as weather and holidays, the rate of this visitor turnover may vary considerably from weekend to weekend throughout the year, but an average rate of 2 full turnovers per weekend day has been assumed (i.e., 50 visitor vehicles would enter and leave the site during the day). As on weekend days, the rate of visitor turnover on weekdays may vary considerably from week to week throughout the year, but the average turnover rate on a weekday is assumed to be half that of a weekend day (i.e., 25 visitor vehicles would enter and leave the site during the day).

Because there is more background traffic during the weekdays, the weekday morning and evening peak hour analysis is used for a more conservative impact assessment related to the recreation function. Only one full turnover would be expected during a weekday. For the purposes of conservatively assessing the traffic impacts during the morning and peak periods, respectively, the traffic analysis assumed that approximately half the vehicles associated with recreation access at the SCRC (13) would enter and exit the project site during both the morning and evening peak period. The result is a total of 26 vehicle trips during both the morning and evening peak periods. The trip generation estimates for the limited trails access is shown in Table 3.7-21.

Table 3.7-21 Proposed Park Weekday Trip Generation Rates

Land Use	Weekday AM Total	Weekday AM In	Weekday AM Out	Weekday PM Total	Weekday PM In	Weekday PM Out
Park	26	13	13	26	13	13

Source: KOA Corporation 2011.

Because left turns are currently and would continue to be prohibited from west-bound Mulholland Drive onto Stone Canyon Road at the SCRC entrance, all traffic related to the trails access function would approach the site on Mulholland Drive from the west. Because of safety conflicts related to turning movements for vehicles exiting the SCRC, left turns onto Mulholland would be prohibited for trails users (see discussion under the impact analysis for TRANS-3 below). Therefore all traffic related to the trails access function would exit onto Mulholland Drive eastbound (i.e., a right turn from Stone Canyon Road onto Mulholland). To analyze the proposed operational condition, vehicle trips that would be generated by the trails access function were added to intersection turn volumes considering projected future growth for the year 2020. Tables 3.7-22 and 3.7-23 provide the morning and evening peak-hour intersection analysis, respectively, during project operation.

Table 3.7-22 Future With Project Operations Phase LOS – AM Peak Hour

#	Intersection	2010		Future Without Project (2020)		Future With Project (2020)		Diff.	Sig. Impact?
		V/C	LOS	V/C	LOS	V/C	LOS		
1	Roscomare Road/Mulholland Drive	0.677	B	0.770	C	0.780	C	0.010	NO
2	Casiano Road/Mulholland Drive	0.620	B	0.707	C	0.711	C	0.004	NO
3	Skirball Center Drive/Mulholland Drive	0.888	D	1.001	F	1.004	F	0.003	NO
4	Skirball Center Drive/I-405 Northbound Ramps	0.799	C	0.895	D	0.897	D	0.002	NO
5	Skirball Center Drive /I-405 Southbound Ramps	0.621	B	0.705	C	0.708	C	0.003	NO

Note: All study intersections are equipped with ATSAC and ATCS capability. Per LADOT policies, a 0.100 V/C reduction has been applied to all calculations.
Source: KOA Corporation 2011.

Table 3.7-23 Future With Project Operations Phase LOS – PM Peak Hour

#	Intersection	2010		Future Without Project (2020)		Future With Project (2020)		Diff.	Sig. Impact?
		V/C	LOS	V/C	LOS	V/C	LOS		
1	Roscomare Road/Mulholland Drive	0.506	A	0.591	A	0.595	B	0.004	NO
2	Casiano Road/Mulholland Drive	0.394	A	0.465	A	0.469	A	0.004	NO
3	Skirball Center Drive/Mulholland Drive	0.640	B	0.738	C	0.741	C	0.003	NO
4	Skirball Center Drive/I-405 Northbound Ramps	0.545	A	0.619	B	0.622	B	0.003	NO
5	Skirball Center Drive /I-405 Southbound Ramps	0.503	A	0.581	A	0.584	A	0.003	NO

Note: All study intersections are equipped with ATSAC and ATCS capability. Per LADOT policies, a 0.100 V/C reduction has been applied to all calculations.
Source: KOA Corporation 2011.

As shown in Tables 3.7-22 and 3.7-23, all of the study intersections except Skirball Center Drive at Mulholland Drive would operate at LOS D or better during the weekday peak hours during the operational phase of the proposed project. However, the project-related V/C ratio increase would not exceed the thresholds of significance established by LADOT at any of the study intersections. The impact to the study intersections during project operations would be less than significant, and no mitigation is required.

Peak hour traffic impacts were analyzed at the study roadway segments to determine potential significant impacts at these locations during operation of the recreation function at the SCRC. Table 3.7-24 summarizes the peak-hour volumes from the daily counts. It should be noted that the peak-hour volumes may not necessarily occur during the typical peak-hour periods between 7:00 a.m. to 9:00 a.m. and between 4:00 p.m. to 6:00 p.m.

Based on the results shown Table 3.7-24, all of the analyzed roadway segments would operate at LOS E or F after project implementation, except on Skirball Center Drive between the northbound and southbound I-405 ramps, which would operate at LOS B. However, the project share of the total volume of vehicles would be less than one percent at each intersection. The impact to the study roadway segments during project operations would be less than significant, and no mitigation is required.

Table 3.7-24 Future With Project Operations (2020) Weekday Roadway Segment Volumes

Study Roadway Segment	Base Volumes								Proposed Project				
	2010			Ambient Growth	Area Projects	Future Base			Recreation Function Only	Future With Recreation			
	Volume	V/C	LOS			Volume	V/C	LOS		Volume	V/C	LOS	% Share
Mulholland Drive between Nicada Drive & Stone Canyon Road	1,338	1.070	F	10%	58	1,535	1.228	F	26	1,561	1.249	F	0.5
Mulholland Drive between Woodcliff Road & Antelo Place	1,225	0.980	E	10%	58	1,411	1.129	F	26	1,437	1.150	F	0.6
Mulholland Drive between Roscomare Road & Casiano Road	1,564	0.834	D	10%	58	1,785	0.952	E	10	1,795	0.957	E	0.2
Skirball Center Drive between Mulholland Drive & I-405 NB Ramps	1,999	0.799	C	10%	58	2,266	0.906	E	8	2,274	0.910	E	0.1
Skirball Center Drive between Skirball Center Drive & I-405 SB Ramps	1,386	0.554	A	10%	37	1,568	0.627	B	4	1,572	0.629	B	0.1

Source: KOA Corporation 2011.

2008 Baseline with Project Conditions

This is an analysis of traffic conditions with the traffic expected during project operation (recreation access) added to baseline traffic volumes in year 2008 representing the release of the NOP. This analysis does not take into account future background traffic volumes (ambient growth) or related project traffic at the time the project vehicle trips would be expected to occur in the future (2020) for project operation, as provided above.

The project traffic volumes for this analysis were based on the project trip generation and trip distribution assumptions discussed above. The significant impact thresholds were based on the same LADOT guidelines that were applied to the future year project analysis above. The study intersection operations for the 2008 baseline with proposed project are summarized in Table 3.7-25 for the morning peak hour and Table 3.7-26 for the evening peak-hour. Traffic impacts created by the project operation under this scenario were calculated by subtracting the V/C totals under the 2008 baseline conditions from the totals under the 2008 baseline with project operation conditions. The LOS calculation worksheets for this analysis are provided in Appendix G.

Table 3.7-25 2008 Baseline With Project Operations Phase Study Intersection LOS – AM Peak Hour

#	Intersection	2008 Baseline		2008 Baseline With Project		Diff.	Sig. Impact?
		V/C	LOS	V/C	LOS		
1	Roscomare Road/Mulholland Drive	0.688	B	0.698	B	0.010	NO
2	Casiano Road/Mulholland Drive	0.631	B	0.635	B	0.004	NO
3	Skirball Center Drive/Mulholland Drive	0.903	E	0.907	E	0.004	NO
4	Skirball Center Drive/I-405 Northbound Ramps	0.813	D	0.815	D	0.002	NO
5	Skirball Center Drive /I-405 Southbound Ramps	0.632	B	0.635	B	0.003	NO

Note: All study intersections are equipped with ATSAC and ATCS capability. Per LADOT policies, a 0.100 V/C reduction has been applied to all calculations.
Source: KOA Corporation 2011.

Table 3.7-26 2008 Baseline With Project Operations Phase Study Intersection LOS – PM Peak Hour

#	Intersection	2008 Baseline		2008 Baseline With Project		Diff.	Sig. Impact?
		V/C	**LOS**	**V/C**	**LOS**		
1	Roscomare Road/Mulholland Drive	0.515	A	0.519	A	0.004	NO
2	Casiano Road/Mulholland Drive	0.402	A	0.406	A	0.004	NO
3	Skirball Center Drive/Mulholland Drive	0.651	B	0.653	B	0.002	NO
4	Skirball Center Drive/I-405 Northbound Ramps	0.555	A	0.558	A	0.003	NO
5	Skirball Center Drive /I-405 Southbound Ramps	0.512	A	0.515	A	0.003	NO

Note: All study intersections are equipped with ATSAC and ATCS capability. Per LADOT policies, a 0.100 V/C reduction has been applied to all calculations.
Source: KOA Corporation 2011.

As shown in Tables 3.7-25 and 3.7-26, recreational traffic added to 2008 baseline conditions would not create significant impacts at any of the study intersections. The impact to the study intersections during project operations would be less than significant, and no mitigation is required.

Baseline traffic impacts at the study roadway segments were also analyzed to determine potential significant impacts at these locations during project operations. Table 3.7-27 summarizes the peak-hour volumes from the daily counts. It should be noted that the peak-hour volumes may not necessarily occur during the typical peak-hour periods between 7:00 a.m. to 9:00 a.m. and between 4:00 p.m. to 6:00 p.m.

Table 3.7-27 2008 Baseline With Project Operations Peak Hour Weekday Roadway Segment Volumes

Study Roadway Segment	2008 Baseline			Recreation Function Only	Baseline With Project Operation			
	Volume	V/C	LOS		Volume	V/C	LOS	% Share
Mulholland Drive between Nicada Drive & Stone Canyon Road	1,358	1.086	F	26	1,384	1.107	F	0.6
Mulholland Drive between Woodcliff Road & Antelo Place	1,243	0.994	E	26	1,269	1.015	F	0.6
Mulholland Drive between Roscomare Road & Casiano Road	1,588	0.847	D	10	1,598	0.852	D	0.2
Skirball Center Drive between Mulholland Drive & I-405 NB Ramps	2,029	0.812	D	8	2,037	0.815	D	0.1
Skirball Center Drive between I-405 SB and NB Ramps	1,407	0.563	A	4	1,411	0.564	A	0.1

Source: KOA Corporation 2011.

Based on the results shown Table 3.7-27, two of the analyzed roadway segments would operate at LOS E or F. However, the project share of the total traffic volume would be less than one percent. Therefore, the impact to the study roadway segments would be less than significant.

TRANS-2 *Construction activity would exceed the level of service standards established by the county congestion management agency for designated roads or highways.*

As discussed in the environmental setting, I-405 within the vicinity of the project site is a CMP mainline freeway monitoring location. The nearest CMP monitoring locations to the project site are the I-405 on/off ramps on Skirball Center Drive and the intersection of Ventura Boulevard at Sepulveda Boulevard, located northwest of the project site.

Based on the trip distribution and traffic assignment presented in TRANS-1 above, construction of the proposed project would primarily result in regional traffic rather than local traffic. However, construction activity would add less than 150 new trips per hour in either direction to the I-405 freeway segments near the project site.

Traffic to and from the project site during construction is expected to use I-405. Traffic is not anticipated to travel through the intersection of Ventura Boulevard at Sepulveda Boulevard. However, the freeway ramps at Skirball Center Drive would experience more than 50 project-related trips during the maximum intensity construction peak periods, as shown below.

- At the I-405 southbound off-ramp at Skirball Center Drive – 55 morning peak hour trips
- At the I-405 northbound on-ramp at Skirball Center Drive – 54 evening peak hour trips

The impact would be significant, and implementation of mitigation measures TRANS-A and TRANS-C is required.

Post-construction operation of the proposed project would not add more than 150 new trips per hour to any freeway segment or more than 50 trips to arterial monitoring locations near the project site during the peak periods. Therefore, an impact analysis at CMP monitoring stations is not required. The operational impact would be less than significant.

TRANS-3 *The proposed project would create a safety hazard during construction and operations at Upper Stone Reservoir associated with incompatible uses on Mulholland Drive.*

As discussed in TRANS-1, construction within Upper Stone Reservoir could generate up to 909 daily trips (94 worker vehicle trips and 815 truck trips), of which 149 trips would occur during both the morning and evening peak periods. Construction traffic would use Mulholland Drive to enter and exit the project site. The SCRC interior access road intersects Mulholland Drive on a horizontal curve in the roadway. Line-of-sight for vehicles traveling east on Mulholland Drive towards the SCRC and vehicles turning left out of the SCRC gate is extremely limited. Therefore, the impact to vehicle safety on Mulholland Drive during project construction would be significant. Implementation of mitigation measures TRANS-B and TRANS-D is required.

During project operation, vehicles would enter and exit the SCRC via Mulholland Drive. Because the SCRC gate is located on a blind curve for traffic approaching from the west, traffic safety issues would persist during project operation. While left turns into the SCRC gate from westbound Mulholland would continue to be prohibited, conflicts could occur from trail users attempting to turn left out of the SCRC gate with those vehicles heading east on Mulholland Drive. Therefore, the impact to vehicle safety on Mulholland Drive during project operation would be significant. Implementation of mitigation measures TRANS-E and TRANS-F is required.

TRANS-4 *The proposed project would not result in inadequate parking capacity.*

During construction, all worker vehicle and equipment parking would occur within the SCRC at the staging areas illustrated on Figure 2-4. No worker vehicle or equipment parking would occur off site. The designated areas are adequate to accommodate the peak number of construction worker vehicles and equipment. There would be no parking impact during construction.

During operation of the proposed trails access function at the SCRC, parking for approximately 25 vehicles would be provided at an existing relatively level pad located approximately 0.25 miles south of the Mulholland Drive access gate. Parking along the access road itself would be prevented with a combination of signs and barriers. As discussed above, the number of parking spaces would determine the number of park users. Thus, the proposed project would not result in adequate parking capacity because no more than 25 vehicles would be permitted on site at any one time. Parking along Mulholland Drive in the vicinity of the access gate is prohibited and would remain so. The operational parking impact would be less than significant.

3.7.3 Mitigation Measures

TRANS-A During Phase 4 of construction, construction haul truck and construction delivery truck trips shall be scheduled to occur during the non-peak periods (defined as occurring between 9:00 a.m. and 4:00 p.m.), to the extent possible.

TRANS-B Prior to construction, a construction traffic control plan shall be prepared for review and approval by the Los Angeles Department of Transportation. The plan may include such elements as advanced signage alerting motorists to construction and an increase in construction vehicle movements; construction speed limit signage along the haul route; and flag persons to control vehicle traffic at the SCRC gate.

TRANS-C During construction, the construction contractor shall space truck trips destined to Interstate 405 to avoid caravans of trucks on the on- and off-ramps during the morning and evening peak hours.

TRANS-D Prior to the start of construction, and periodically during construction, as necessary, the construction contractor shall provide all construction drivers with safety training to minimize conflicts between construction activities and vehicles using Mulholland Drive. Training shall include adherence to posted speed limits, discussion of haul routes, and explanation of the construction traffic control plan.

TRANS-E Prior to operation of the trails access function at the SCRC, warning signs shall be placed for eastbound traffic on Mulholland Drive approaching the SCRC gate to provide notice that vehicle turn movements are occurring.

TRANS-F Prior to operation of the trails access function at the SCRC, signage shall be installed along the SCRC interior site access road and at the intersection of the SCRC interior site access road with Mulholland Drive prohibiting left-turn movements onto Mulholland Drive except for Los Angeles Department of Water and Power vehicles.

3.7.4 Significance After Mitigation

With implementation of mitigation measure TRANS-A, vehicle deliveries and construction haul truck trips would be moved to the off-peak period. Peak vehicle trip generation would consist solely of worker vehicle trips, as shown in Table 3.7-28.

Table 3.7-28 Phase 4 Construction Daily One-Way Trip Generation Calculations after Implementation of Mitigation Measure TRANS-A

Generator	Daily	Weekday AM Total	Weekday AM In	Weekday AM Out	Weekday PM Total	Weekday PM In	Weekday PM Out
Employee[1]	94	47	47	0	47	0	47
Delivery Truck	0	0	0	0	0	0	0
Total	*94*	*47*	*47*	*0*	*47*	*0*	*47*

[1] Employee trips = 1 employee per vehicle
Source: KOA Corporation 2011.

As shown in Table 3.7-28, a total of 47 daily trips would occur during each of the peak periods, consisting solely of worker vehicle trips. This represents a substantial reduction in vehicle trips during the peak hour compared to the analysis for Phase 4 and Phase 4 Alternative Scenario A (Double Construction Schedule) described in TRANS-1 above.

Using the same trip distribution patterns as assumed in TRANS-1 above, the study intersection impacts were calculated based on the implementation of Mitigation Measure TRANS-A. Tables 3.7-29 and 3.7-30 summarize the intersection impact analysis in 2019 for Phase 4 after implementation of mitigation measure TRANS-A during the morning and evening peak periods, respectively. The LOS calculation worksheets for this analysis are provided in Appendix G.

Table 3.7-29 Phase 4 Construction (2019) Study Intersection LOS – AM Peak Hour after Implementation of Mitigation Measure TRANS-A

#	Intersection	2010		Future Without Project (2019)		Future With Project (2019)		Diff.	Sig. Impact?
		V/C	LOS	V/C	LOS	V/C	LOS		
1	Roscomare Road/Mulholland Drive	0.677	B	0.762	C	0.795	C	0.033	NO
2	Casiano Road/Mulholland Drive	0.620	B	0.699	B	0.732	C	0.033	NO
3	Skirball Center Drive/Mulholland Drive	0.888	D	0.990	E	0.990	E	0.000	NO
4	Skirball Center Drive/I-405 Northbound Ramps	0.799	C	0.886	D	0.894	D	0.008	NO
5	Skirball Center Drive /I-405 Southbound Ramps	0.621	B	0.698	B	0.714	C	0.016	NO

Note: All study intersections are equipped with ATSAC and ATCS capability. Per LADOT policies, a 0.100 V/C reduction has been applied to all calculations.
Source: KOA Corporation 2011.

Table 3.7-30 Phase 4 Construction (2019) Study Intersection LOS – PM Peak Hour after Implementation of Mitigation Measure TRANS-A

#	Intersection	2010		Future Without Project (2019)		Future With Project (2019)		Diff.	Sig. Impact?
		V/C	LOS	V/C	LOS	V/C	LOS		
1	Roscomare Road/Mulholland Drive	0.506	A	0.584	A	0.617	B	0.033	NO
2	Casiano Road/Mulholland Drive	0.394	A	0.459	A	0.459	A	0.000	NO
3	Skirball Center Drive/Mulholland Drive	0.640	B	0.730	C	0.763	C	0.033	NO
4	Skirball Center Drive/I-405 Northbound Ramps	0.545	A	0.612	B	0.628	B	0.016	NO
5	Skirball Center Drive /I-405 Southbound Ramps	0.503	A	0.575	A	0.592	A	0.017	NO

Note: All study intersections are equipped with ATSAC and ATCS capability. Per LADOT policies, a 0.100 V/C reduction has been applied to all calculations.
Source: KOA Corporation 2011.

As shown in Tables 3.7-29 and 3.7-30, implementation of mitigation measure TRANS-A would eliminate significant impacts at all of the study intersections during both the morning and evening peak hours during Phase 4 of construction in 2019. The construction impact would be reduced to a less than significant level.

Haul truck trips in Phase 3 of construction are primarily composed of concrete delivery trucks. Because of the perishable nature of concrete and the requirement to maintain a constant and controlled pace for concrete pours, restrictions related to non-peak periods cannot be applied to concrete truck deliveries. Therefore, mitigation measure TRANS-A cannot be implemented in Phase 3 in a manner that would substantially reduce impacts from truck traffic. Significant and unavoidable impacts would remain at the following intersections during this phase of construction:

- Roscomare Road and Mulholland Drive – a.m. and p.m. peak
- Casiano Road and Mulholland Drive – a.m. peak
- Skirball Center Drive and Mulholland Drive – a.m. and p.m. peak
- Skirball Center Drive and I-405 northbound on- and off-ramps – a.m. peak

The construction intersection impact would remain significant and unavoidable.

Implementation of mitigation measures TRANS-A and TRANS-B would reduce the traffic volumes on the study roadway segments during the morning and evening peak periods. However, the total volume of traffic on the study intersections would not change. Therefore, the impacts to the study roadway segments would remain significant and unavoidable.

Impacts to the study intersections and roadway segments during project operation (i.e., post-construction trails access) would be less than significant without implementation of mitigation measures in the year 2020, at the time that the SCRC would be opened up to public access.

Implementation of mitigation measures TRANS-A and TRANS-C would avoid caravans of construction trucks stacking up on the I-405 on- and off-ramps during peak phases of construction. The impact would be reduced to a less than significant level.

Implementation of mitigation measures TRANS-D would minimize incompatibility issues between construction traffic and private vehicles traveling along Mulholland Drive during the construction period. Implementation of mitigation measures TRANS-E and TRANS-F would reduce the safety hazard associated with trails access to a less than significant level.

Impacts related to parking supply would be less than significant without implementation of mitigation.

CHAPTER 4
IMPACT OVERVIEW

This chapter provides an overview of the environmental effects of the proposed project, including significant unavoidable adverse impacts, impacts not found to be significant, cumulative impacts, significant irreversible environmental changes, and growth-inducing impacts. Cross-references are made throughout this chapter to other chapters of the EIR where more detailed discussions of the impacts of the proposed project can be found.

4.1 Significant Unavoidable Adverse Impacts

This section is prepared in accordance with Section 15126.2(b) of the CEQA Guidelines, which requires the discussion of any significant environmental effects that cannot be avoided if a project is implemented. These include impacts that can be mitigated, but cannot be reduced to a less than significant level. An analysis of environmental impacts caused by the proposed project has been conducted and is contained in this EIR in Chapter 3. Seven issue areas were analyzed in detail in Chapter 3. According to the environmental impact analysis, the proposed project would result in significant unavoidable adverse impacts related to construction air quality (Chapter 3.2), operational wildland fire (Chapter 3.5), construction noise (Chapter 3.6), and construction traffic (Chapter 3.7).

Even with implementation of mitigation, construction activities for the proposed project would generate regional pollutant emissions in excess of the SCAQMD daily emissions thresholds. In addition, localized emissions of PM_{10} and $PM_{2.5}$ would exceed the SCAQMD daily emissions thresholds during construction. Due to the very high existing hazard associated with wildland fire within Stone Canyon and the nature of wildfire ignitions in the Santa Monica Mountains environment, the addition of recreational users would increase the potential for catastrophic wildfire events. Although the proposed project would be required to comply with the City of Los Angeles Noise Ordinance to limit noise during construction, the on-site noise levels associated with the haul truck trips along the SCRC interior access road would exceed acceptable noise levels at nearby sensitive receptors located on Antelo Place and Roscomare Road. Even after shifting delivery and haul truck trips to off-peak periods, significant and unavoidable intersection and roadway segment impacts would be created during construction for both the morning and evening peak traffic periods.

4.2 Effects Not Found to be Significant

Section 15128 of the CEQA Guidelines requires the identification of impacts of a project that were determined not to be significant and that were not discussed in detail in the impact chapters of the EIR. These issues were eliminated from further review during the Initial Study process (see Appendix A). The following section presents a brief discussion of environmental issues that were not found to be significant for this project, including agriculture and forestry resources, geology and soils, hazards and hazardous materials, hydrology and water quality, land use planning, mineral resources, population and housing, public services, recreation, and utilities and service systems.

4.2.1 Agriculture and Forestry Resources

Upper Stone Canyon Reservoir is located in the Bel Air-Beverly Crest community of the City of Los Angeles in an area that is zoned [Q]OS-1XL (Open Space). The proposed project is located on a previously developed site owned by LADWP and used for drinking water storage.

The SCRC is not zoned for agricultural purposes and is not used for agricultural purposes. There is no Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland) on or in the vicinity of the project site. Therefore, there would be no potential for construction or operation of the proposed project to convert Farmland, either directly or indirectly, to non-agricultural use. No Williamson Act contract applies to the SCRC. Thus, the proposed project would not conflict with existing zoning for agricultural use or a Williamson Act contract. Replacing the existing open reservoir with a new buried reservoir would not result in the conversion of Farmland to non-agricultural use.

The SCRC is not zoned forestland, timberland, or timberland production and is not used for forestry purposes. There is no forestland, timberland, or timberland production on or within the vicinity of the project site. Thus, the construction of a buried reservoir and use of the site for passive recreation would not result in the conversion of forestland to non-forest use.

4.2.2 Geology and Soils

As with most of Southern California, the project site is located in a seismically active region. The SCRC is not located within an Alquist-Priolo Earthquake Fault Zone or within a Fault Rupture Study Area, as mapped by the City of Los Angeles and the California Geological Survey. The closest known fault to the proposed project site, the Hollywood Fault, is located approximately 2 miles to the southeast. Therefore, as with all of Los Angeles County, the project area is susceptible to high-intensity ground shaking that affects all structures in the City. However, the buried reservoir would be constructed in accordance with seismic requirements of the City of Los Angeles and California Building Codes and the standards of the California Department of Water Resources, Division of Safety of Dams for seismic safety. Compliance with established standards would reduce risks of structural failure or collapse to a less than significant level.

Preliminary geotechnical analyses of the area surrounding Upper Stone Reservoir indicate that most areas are geologically stable and do not present a general concern relative to the proposed project. However, the slopes immediately east of Upper Stone Reservoir have experienced several relatively recent and moderately significant landslides (one in 1956 and two in 1969) that were caused by the adverse bedding of sedimentary layers resting on a clay soil plane. Therefore, as discussed in Chapter 2, if a similar landslide were to occur in this area after the implementation of the proposed project, the buried reservoir could be seriously damaged. Because of the significant cost of the buried reservoir and because repairs necessitated by such a landslide event could remove Upper Stone Reservoir from service for a lengthy period and require major construction and investment, including entirely demolishing and rebuilding Upper Stone Reservoir, these potential landslide areas would be stabilized as part of the proposed project. Soil stabilization would consist of a combination of grading some portions of the east slope and installing soil nails to pin the hillside in place. Any work in hillside areas would comply with the City Hillside Grading Ordinance, and the slopes would be stabilized as necessary to prevent landslides during and after the construction phase. Compliance with established standards would reduce risks associated with landslides to a less than significant level.

According to the City of Los Angeles Safety Element, the project site is not located in a liquefaction zone. In addition, the proposed project is not located on soils that are expansive, as described in Table 18-1B of the Uniform Building Code. However, construction of the proposed project has the potential to result in soil erosion or the loss of topsoil during ground disturbing activities. Most ground disturbing activities would be limited to the existing Upper Stone Reservoir, landslide stabilization areas, and stockpile area. Since the proposed project site is greater than one acre, LADWP’s construction contractor must prepare and comply with a Storm Water Pollution Prevention Plan, which would include erosion control measures. In addition, LADWP’s construction contractor must comply with the Storm Water Construction Activities General Permit and obtain a National Pollution Discharge Elimination System Permit. Compliance with existing regulations would reduce impacts due to soil erosion to a less than significant level. After construction of the buried reservoir, the disturbed portions of the SCRC would be stabilized and revegetated. Thus, no significant soil erosion or loss of topsoil is expected to occur.

4.2.3 Hazards and Hazardous Materials

Although construction may involve the transport, storage, use, or disposal of some hazardous materials, such as on-site fueling/servicing of construction equipment, construction activities would be short-term. Such transport, use, storage, and disposal would not be expected to create a significant hazard to workers or the community. In addition, all construction activities involving hazardous materials would be subject to federal, state, and local health and safety requirements involving their transport, use, storage, and disposal. As under current conditions, the buried reservoir would be used for the storage of treated drinking water. If additional disinfection is required, trained water treatment personnel would add standard water treatment chemicals to the reservoir. These water treatment operations are subject to federal, state, and local health and safety requirements. The proposed project would not substantially alter current operations relative to drinking water treatment at the SCRC.

Operation of SCRC as a passive recreation area may involve the use of herbicides to control invasive weed species, which would be subject to federal, state, and local health and safety requirements as currently occurs throughout recreation areas within the City of Los Angeles. As described in Chapter 2, public access to areas within the SCRC containing operational water treatment and water storage functions would create potential safety, security, hazards, and vandalism conflicts. In addition, the primary access road entering the site at Mulholland Drive would represent a potential safety conflict because it is relatively narrow and winding and is frequently used by large trucks to deliver materials and supplies related to water operations to the SCRC facilities, including chemical deliveries. Therefore, public access to the SCRC would be limited to a trails system that would be segregated from the operational elements of the complex and Lower Stone Reservoir by new boundary fences, and parking would be limited to an approximately 25 space lot located off of the access road near the entry gate. No parking along the access road would be permitted. Due to the restrictions placed on public access in the SCRC, reasonably foreseeable upset or accident conditions that could involve the release of hazardous materials into the environment are not anticipated during operation of the proposed project.

The proposed project would not impair or physically interfere with an adopted emergency response plan or a local, state, or federal agencies emergency evacuation plan. No road closures would occur during construction or operation of the proposed project that would hinder emergency access. In addition, the LAFD helicopter landing areas on-site would continue to be accessible during the construction and operational phases of the proposed project.

According to the City of Los Angeles General Plan Safety Element, the project site is located in a VHFHS Zone. In accordance with the Los Angeles Public Safety Code, fire prevention procedures listed in Section 2.6.3 would be implemented during project construction to control the risk of wildland fire. Compliance with existing regulations and implementation of construction Best Management Practices would ensure a less than significant impact during construction.

4.2.4 Hydrology and Water Quality

Construction of the proposed project would result in ground surface disturbance during excavation and grading that could create the potential for erosion and impacts to water quality to occur. Most ground disturbing activities would occur within the existing Upper Stone Reservoir. Since the proposed project site is greater than one acre, LADWP's construction contractor must prepare and comply with a Storm Water Pollution Prevention Plan, which would include erosion control measures. In addition, LADWP's construction contractor must comply with the Storm Water Construction Activities General Permit and obtain a National Pollution Discharge Elimination System Permit. Compliance with existing regulations would reduce impacts due to soil erosion and water quality contamination to a less than significant level. After construction of the buried reservoir, areas of disturbance within the SCRC would be stabilized and revegetated. Thus, no significant runoff or soil erosion is expected to occur that would negatively impact water quality.

In the event that dewatering of the site is required during project construction, all discharges would be carried out in accordance with applicable requirements of the Regional Water Quality Control Board, including compliance with the NPDES permit regulations. The proposed project would not substantially alter the existing drainage pattern of the SCRC or the area. The proposed project would continue to discharge storm water runoff into the existing storm drainage system. The amount of storm water runoff during construction or operation of the proposed project would not be expected to exceed the capacity of the existing storm water system. Therefore, construction and operation of the proposed project would not create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff.

Upper Stone Canyon itself is designated a 100-year flood hazard area according to the City of Los Angeles General Plan Safety Element. However, the proposed project would remove the uncovered Upper Stone Reservoir and replace it with a buried reservoir, thereby reducing the potential for inundation of downstream areas. As such, the construction and operation of the proposed project would not increase the risk from flood or inundation.

4.2.5 Land Use and Planning

Removal of the existing reservoir to replace it with a buried reservoir and using a portion of the SCRC for passive recreation would not divide an established community. The proposed project would not create a physical barrier.

The proposed project site is designated as Open Space in the City of Los Angeles General Plan. The zoning designation for the proposed project site is [Q]OS-1XL (Open Space). The proposed project would bury the existing uncovered Upper Stone Reservoir and provide limited trails access within a portion of the SCRC. Thus, the proposed project would not conflict with an applicable land use plan.

4.2.6 Mineral Resources

The proposed project site is located in an area where urban development has already occurred, and the surrounding residential uses would likely preclude mining in the area. Locally important mineral resources are not located on or near the site. There are no known mineral deposits of economic importance underlying the project site. Development of the proposed project would not result in the loss of availability of any mineral resource.

4.2.7 Population and Housing

The proposed project is intended to ensure the reliability and safety of the existing water supply. The proposed project does not involve increasing the amount of water that can be stored on site such that additional water supplies would be available. As such, the proposed project would not induce substantial population growth in the area, either directly or indirectly. Construction and operation of the proposed project would occur within and adjacent to Upper Stone Reservoir. There is no existing housing within SCRC, and the proposed project does not require the removal of housing. Therefore, construction and operation of the proposed project would not impact the number or availability of existing housing in the area and would not necessitate the construction of replacement housing elsewhere.

4.2.8 Public Services

Fire service to the project site is provided by the City of Los Angeles Fire Department. Police protection services are provided by the City of Los Angeles Police Department. In addition, LADWP currently has security staff stationed on site. Operation of the proposed project would not require additional fire or police protection such that new or expansion of existing fire or police protection facilities would be required, the construction of which could cause significant environmental impacts.

The primary objective of the proposed project is to ensure the safety and reliability of the drinking water supply in accordance with updated EPA rules regarding surface water treatment and byproducts associated with current drinking water disinfection processes. No population increase in the project area would result from construction and operation of the buried reservoir in place of Upper Stone Reservoir. No new housing or businesses would be constructed as part of the proposed project to induce population growth. No substantial adverse physical impact to local schools, parks, or other public facilities would occur.

4.2.9 Recreation

The proposed project involves the creation and operation of limited trails access within the SCRC. It would not increase the use of existing park areas or other recreation facilities such that substantial physical deterioration of nearby parks would occur or be accelerated. While no impacts to recreation would occur, the potential for impacts to aesthetics, air quality/greenhouse gas emissions, biological resources, cultural resources, wildland fire, noise, and transportation and traffic related to the operation of the passive recreation within the SCRC are addressed in their respective chapters of this EIR.

4.2.10 Utilities and Service Systems

The proposed project would not result in changes to facilities or operations at existing wastewater treatment facilities. Construction and operation of the proposed project would generate only minor amounts of wastewater. No impact to wastewater treatment requirements of the applicable Regional Water Quality Control Board would occur.

The proposed project includes the replacement of Upper Stone Reservoir with a buried reservoir and operation of the SCRC for passive recreation. The buried reservoir would have essentially the same storage capacity as the existing reservoir. During project construction, Upper Stone Reservoir would be out of service for approximately 4 years. Potable water would be provided to the service area through a bypass line from existing LADWP supplies. LADWP would supplement its water supply with additional purchased water from the Metropolitan Water District during the construction period to ensure that there would be adequate supply to meet peak demand. No shortage of water supply would be expected. During operation, the proposed project would temporarily require increased water supply for the irrigation of revegetated areas. However, the increase in water demand would be minimal in relation to the total available supply.

Construction debris would be recycled or transported to a landfill site and disposed appropriately. In accordance with the Citywide Construction and Demolition Debris Recycling Ordinance, LADWP's construction contractor would work to ensure that source reduction techniques and recycling measures are incorporated into project construction and operation. The amount of debris generated during project construction is not expected to significantly impact landfill capacities. Operation of the proposed project would not result in an increase in personnel at the project site in relation to the water storage functions. The site would be used for passive recreation, which would generate relatively small additional quantities of waste that would not significantly impact landfill capacities. During construction and operation of the proposed project, LADWP would comply with all City and state solid waste diversion, reduction, and recycling mandates, including compliance with the County-wide Integrated Waste Management Plan and the City of Los Angeles Municipal Code.

4.3 Cumulative Impacts

According to Section 15355 of the CEQA Guidelines, cumulative impacts refer to:

> "two or more individual effects which, when considered together are considerable or which compound or increase other environmental effects. The individual effects may be changes resulting from a single project or a number of separate projects. The cumulative impact from several projects is the change in the environment that results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time."

According to Section 15130 (b)(1)(A) of the CEQA Guidelines, a list of past, present, and probable future projects producing related or cumulative impacts may be used as the basis of the cumulative impacts analysis. Because construction of the proposed project would not begin until 2015, a list approach for the cumulative impact analysis was used for air quality/greenhouse gas emissions, noise, and transportation/traffic (see Table 3.7-5).

4.3.1 Aesthetics

The proposed project site is located at the bottom of a canyon. The only publicly accessible viewpoint is located from the Santa Monica Mountains Conservancy Nicada Overlook located east of the SCRC access gate on Mulholland Drive. All other views of Upper Stone Reservoir are from the private homes located on the ridgelines above the canyon. As discussed in Chapter 3.1, Aesthetics, the proposed project would change the visual quality of the SCRC by replacing the open water surface of Upper Stone Reservoir with low-growing scrub vegetation similar to the existing vegetation located within the SCRC; therefore, the proposed project would have a less than significant impact on scenic vistas and the character of the site and its surroundings. There are no other known projects within the limited viewshed of Upper Stone Reservoir that would contribute to a cumulatively significant impact to aesthetic resources.

4.3.2 Air Quality/Greenhouse Gas Emissions

Cumulative air quality impacts are considered on a regional basis, taking into account background growth and cumulative projects. Table 3.2-6 indicates analysis reflecting cumulative air quality considerations related to project construction. The proposed project would result in a regionally significant impact during construction relative to NO_X, PM_{10}, and $PM_{2.5}$ emissions. It is anticipated that some reasonably foreseeable past, present, and future projects would also result in significant air quality impacts. While SCAQMD-required mitigation measures would reduce air quality impacts, it is anticipated that the construction of the related projects may result in a regionally significant cumulative impact.

As with construction emissions, operational air quality emissions take into account background growth and cumulative projects. As shown in Table 3.2-7, the proposed project would not result in a significant air quality impact during operation. Therefore, cumulative operational air quality would be less than significant.

As shown in Table 3.2-9, the proposed project would not generate GHG emissions above the 10,000 metric tons of CO_2e threshold over a 30-year period. Because GHG emissions are considered cumulative by nature, the cumulative impact would be less than significant.

4.3.3 Biological Resources

As discussed in Chapter 3.3, Biological Resources, implementation of the proposed project would impact migratory bird species, coast horned lizard, and coastal western whiptail. In addition, it would result in the removal of and disturbance to sensitive plant species and vegetation communities, as well as trees protected by the City’s Tree Protection Ordinance. These project-level impacts would be mitigated to less than significant level. The project site is located within SCRC, which is owned by LADWP and designated Open Space. No other development projects are currently planned or being considered within the SCRC. All reasonably foreseeable past, present, and future development projects would occur off site. Because impacts to biological resources are site-specific, implementation of the proposed project (including the incorporation of the identified mitigation measures) in conjunction with other projects in the area would not contribute to a significant cumulative impact to biological resources.

4.3.4 Cultural Resources

As discussed in Chapter 3.4, Cultural Resources, the SCRC does not contain historic resources and is not likely to contain significant archaeological or paleontological resources. Reasonably foreseeable past, present, and future development projects in the area would be required to determine the potential for the projects to impact historic, archaeological, and paleontological resources. Because impacts to archaeological and paleontological resources are site specific, the proposed project would not contribute to a significant cumulative impact.

4.3.5 Wildland Fire

As discussed in Chapter 3.5, Wildland Fire, the SCRC is located in a VHFHS Zone that is characterized by both a very high wildfire hazard and wildfire risk. Operation of the proposed project would allow the public to enter portions of the SCRC and increase the potential for a wildfire to occur. Although this increase in risk associated with providing public access is not specifically quantifiable, it is considered a significant environmental impact in relation to exposing people and/or structures to substantial loss, injury, or death related to wildfire, especially because it could result in a potentially catastrophic event. However, because any single ignition event occurs essentially independently of the other potential ignitions in a given area, the public access component of the project would not represent a cumulatively significant impact in relation to reasonably foreseeable past, present, and future development projects in the vicinity of the SCRC. Thus, the cumulative impact of wildland fire would be less than significant.

4.3.6 Noise

When calculating future traffic impacts, nine cumulative projects were taken into consideration (see Table 3.7-5). Since noise impacts for the proposed project are generated directly from the traffic analysis results, the future without project and future with project noise impacts described in Chapter 3.6, Noise, already reflect cumulative impacts. Thus, there would not be a cumulatively considerable noise impact during construction associated with off-site activity.

Similar to construction noise, operational noise sources takes into consideration cumulative impacts from the nine other related projects. As shown in Table 3.6-7, although there would be a minor increase in mobile noise sources associated with the operation of a portion of the SCRC for passive recreation, this would not exceed the City's standards. Therefore, the proposed project would not contribute to a cumulatively considerable impact related to noise during operation.

Vibration impacts associated with construction activities are extremely localized because they are groundborne. Groundborne vibration generated by construction equipment spreads through the ground and diminishes greatly in magnitude with increases in distance. As such, groundborne vibration associated with the proposed project would not be heightened due to the related projects because of the distance between them and the project site. Consequently, no cumulative impacts from vibration would result. During operation, the proposed project would create no impacts related to vibration, and thus, would not add to a cumulative vibration impact in the area.

4.3.7 Transportation and Traffic

As discussed in Chapter 3.7, Transportation and Traffic, the future traffic conditions take into account nine cumulative projects and ambient growth in traffic volumes in the area that could potentially affect traffic circulation through the study area. With the addition of construction vehicle trips generated by the proposed project combined with background traffic growth, the proposed project would create significant and unavoidable impacts at multiple study intersections during the morning and evening peak periods. The proposed project would also increase traffic volumes on three of the study roadway segments above LADOT thresholds. Thus, the short-term project construction-related impact would be cumulatively considerable.

During operation of the proposed project, the addition of recreational users' vehicles trips to and from the SCRC during peak periods of activity added to background traffic growth would not cause significant impacts at any of the study intersections and study roadway segments. Thus, long-term project-related traffic would not contribute to a significant cumulative impact.

4.4 Significant Irreversible Environmental Changes

Public Resources Code Section 21100(b)(2)(B) and Section 15126.2(c) of the CEQA Guidelines require that an EIR analyze the extent to which the proposed project's primary and secondary effects would impact the environment and commit nonrenewable resources to uses that future generations will not be able to reverse. Construction and operation of the proposed project would result in the use of nonrenewable resources during construction, including fossil fuels, natural gas, water, and building materials, such as concrete and steel. However, the proposed project is not anticipated to consume substantial amounts of energy in a wasteful manner, and it would not result in significant impacts from consumption of utilities. Although the proposed project would result in the consumption of nonrenewable resources, the impact would not be considered significant.

4.5 Growth-Inducing Impacts

According to Section 15126.2(d) of the CEQA Guidelines, growth-inducing impacts of the proposed project shall be discussed in the EIR. Growth-inducing impacts are those effects of the proposed project that might foster economic or population growth or the construction of new housing, either directly or indirectly, in the surrounding environment. According to CEQA, increases in the population may tax existing community service facilities, requiring construction of new facilities that could cause significant environmental effects.

Induced growth is any growth that exceeds planned growth and results from new development that would not have taken place without the implementation of the proposed project. Typically, the growth-inducing potential of a project would be considered significant if it results in growth or population concentration that exceeds those assumptions included in pertinent master plans, land use plans, or projections made by regional planning authorities. However, the creation of growth-inducing potential does not automatically lead to growth, whether it would be below or in exceedance of a projected level. The environmental effects of induced growth are secondary or indirect impacts of the proposed project. Secondary effects of growth could result in significant, adverse environmental impacts, which could include increased demand on community or public services, increased traffic and noise, degradation of air and water quality, and conversion of agricultural land and open space to developed uses.

Implementation of the proposed project is not expected to induce growth. The proposed project involves the replacement of Upper Stone Reservoir with a buried reservoir in order to meet water quality standards. The proposed project is intended to ensure the reliability and safety of the existing water supply. The proposed project does not involve substantially increasing the amount of water that can be stored on site such that additional water supply would be available to support growth. As such, the proposed project would not induce substantial population growth in the area, either directly or indirectly. No impact would occur.

CHAPTER 5
ALTERNATIVES TO THE PROPOSED PROJECT

5.1 Overview

Alternatives to the proposed project have been considered in this EIR to explore potential means to mitigate or avoid the significant environmental impacts associated with implementation of the project while still achieving the primary objectives of the project. According to Section 15126.6(a) of the CEQA Guidelines, “an EIR shall describe a range of reasonable alternatives to the proposed project, or to the location of the proposed project, which would feasibly attain most of the basic objectives of the proposed project, but would avoid or substantially lessen any of the significant effects of the proposed project, and evaluate the comparative merits of the alternatives.” The CEQA Guidelines state that an EIR should not consider alternatives that are deemed infeasible. Under CEQA, factors other than physical achievability that can determine feasibility are site suitability, economic limitations, availability of infrastructure, General Plan consistency, other plan or regulatory limitations, and jurisdictional boundaries. In addition, according to the CEQA Guidelines, “an EIR need not consider every conceivable alternative to a project.” Instead, an EIR should present a reasonable range of feasible alternatives that will support informed decision making and public participation regarding the potential environmental consequences of a project and possible means to address those consequences. An EIR need not consider alternatives whose effects cannot be reasonably ascertained and whose implementation is remote or speculative. However, the alternatives analysis must include an evaluation of the No Project Alternative per Section 15126.6(e) of the CEQA Guidelines to determine the consequences of not implementing the proposed project or another alternative to the project. Through the identification and evaluation of alternatives, the relative advantages and disadvantages of each alternative compared with the proposed project can be determined.

Impacts of the Proposed Project

The proposed project was found to result in significant environmental impacts related to air quality, biological resources, cultural resources, wildland fire, noise, and transportation and traffic. The short-term construction impacts related to air quality, noise, and traffic and long-term operational impacts related to wildland fire cannot be practically mitigated to a less than significant level based on thresholds of significance established in CEQA or other regulatory guidelines. Impacts to biological resources and cultural resources would be reduced to a less than significant level with implementation of mitigation measures. The alternatives presented in this section were considered to provide a range of reasonable options to the proposed project that might address the identified impacts.

Project Objectives

By definition, alternatives to the proposed project must achieve most of the basic project objectives. The purpose of the proposed project is to maintain and improve the quality, reliability, and stability of the SCRC service area drinking water supply in order to continue to meet existing demand.

The primary project objectives related to this purpose are to:

- Comply with updated water quality standards enacted by the EPA and, by extension, the California Department of Public Health, including the Stage 2 D-DBPR, which establishes new regulations related to the formation of potentially carcinogenic disinfection byproducts that may result from certain drinking water chemical disinfection processes, and the LT2ESWTR, which establishes new regulations related to the presence of microbial pathogens in drinking water supplies.
- Preserve local water storage capability to maintain reliability and flexibility to meet the SCRC service area demand for drinking water at required distribution system pressures, including during emergency or planned outages of upstream supplies.

A secondary objective of the proposed project is to help restore the natural character of those portions of Stone Canyon involved in the project improvements, to the extent that this can be accomplished consistent with the achievement of the primary water quality and water storage objectives.

A complete discussion of these objectives is provided in Section 2.5 of this EIR.

Alternatives Development

Most of the alternatives presented in this section of the EIR derive from a planning process conducted by LADWP that involved representatives of the Stone Canyon community, including members of the Stone Canyon Subcommittee of CPOR. This process was conducted prior to the identification of the buried reservoir as the proposed project to be analyzed in the EIR. Therefore, not all the alternatives identified during the earlier public participation process are appropriate in relation to addressing potential environmental impacts that would be created by the proposed project. However, consistent with CEQA, the alternatives that are presented in the EIR reflect a range of approaches to attaining the primary project objectives related to water quality and water storage, including various means of covering the drinking water supply currently stored in Upper Stone Reservoir; employing methods to disinfect the water that has been stored in the reservoir (rather than covering the reservoir); providing water to the SCRC service area through improvements to the water distribution system as a functional substitute for Upper Stone Reservoir; and relocating the water storage function of Upper Stone Reservoir to an alternative protected site.

5.2 Alternatives Considered but Dismissed from Further Analysis

Many alternatives developed during the planning process involving the Stone Canyon community were not considered for further detailed analysis in this EIR because, based on the currently proposed project, the alternatives either did not meet most of the basic project objectives; were deemed to be infeasible; and/or would not substantially lessen the predicted environmental impacts of the proposed project or would result in additional significant impacts not created by the proposed project. The alternatives that were not further considered in detail are summarized below, including a brief description of the alternative, a determination of its feasibility, and, where appropriate, an assessment of the alternative's achievement of the basic project objectives and its potential environmental impacts.

5.2.1 Buried Concrete Tanks

Under this alternative, both the primary and secondary objectives of the proposed project would be achieved by constructing and completely burying concrete tanks in place of the existing Upper Stone Reservoir. A maximum of 3 feet of soil cover would be placed over the buried tanks, and shallow-rooting plant species typical of the canyon environment and surrounding area would be installed. As discussed in Section 2.1 of this EIR, the proposed project that was presented to the public during public meetings held in the Stone Canyon community in July and December of 2008 reflected this alternative, consisting of three separate underground cylindrical concrete tanks that would be constructed within the basic footprint of the existing Upper Stone Reservoir. Tanks differ from the buried reservoir currently under consideration in the EIR as the proposed project in that they consist of an essentially flat floor and vertical side walls, and they require a taller structure to provide the necessary storage volume. The tanks would be constructed of cast-in-place concrete, prestressed using wire coil wrappings. In order to build the tanks, Upper Stone Reservoir and all appurtenant facilities would need to be entirely demolished, including the reservoir's asphalt lining; the inlet line; the outlet tower and line; and the surrounding road, curb, and fence. In addition, a portion of the existing 60-inch reservoir bypass line would need to be demolished and rebuilt because it would not be located at the depth necessary to allow the proposed tanks to function properly. Similar to the proposed project, the potential landslide areas east of Upper Stone Reservoir would need to be stabilized because of the substantial cost of the buried tanks and because repairs necessitated by a landslide event could remove the tanks from service for a lengthy period and require major construction and investment, including entirely demolishing and rebuilding the tanks. The potential landslide areas encompass approximately 20 acres.

The buried concrete tanks alternative would fulfill the primary water quality objective of the proposed project related to the Stage 2 D-DBPR and LT2ESWTR because it would entirely enclose the Upper Stone Reservoir water supply, allowing for the proper management of chloramine disinfectant levels and limiting contamination by pathogenic microorganisms. The buried tanks alternative would fulfill the primary water storage objective of the proposed project because it would preserve local storage capability to maintain reliability and flexibility to meet the SCRC service area demand for drinking water. Because this alternative would allow for the complete burial of the water supply facilities (with the exception of minor aboveground appurtenant elements), it would also fulfill the secondary objective of the proposed project to help restore the natural character of those portions of the canyon involved in the project improvements by establishing native vegetation atop the tanks. As under the proposed project, the concrete tanks could only support a maximum of 3 feet of soil cover, limiting the type of plant material that could successfully establish above the tanks because of the relatively shallow soil depth. Although this more limited plant palette would not entirely replicate, either visually or biologically, the natural habitat of Stone Canyon, it would generally mimic the canyon environment, providing a lower-growing meadow appearance, while essentially concealing the manmade elements of the water storage facilities.

Although the buried tanks alternative would be feasible and would meet all the proposed project objectives, it would require a greater amount of earthwork activity than the proposed buried reservoir because of the configuration and required depth of the tanks. This earthwork activity would involve excavating, stockpiling, and backfilling that could entail the movement of over 2 million CY of earth material and would involve the disturbance of relatively large areas in Stone Canyon (up to 40 acres) that lie outside the general footprint of the existing Upper Stone Reservoir and that would be required as material borrow and stockpile sites. Compared to the proposed project, the earthwork for the buried tanks alternative would increase the temporary but significant environmental impacts related to air quality, noise, and traffic. It would also considerably increase the impacts to sensitive biological habitat based on the relatively substantial expansion of the area of disturbance related to construction. Consistent with the City of Los Angeles Board of Water and Power Commissioners direction regarding the proposed project, because this alternative would provide a buried water storage facility, public access for passive recreation use would be established at the SCRC. Therefore, the impact of the proposed project related to an increased risk from wildland fire would not be eliminated or reduced by this alternative compared to the proposed project. Because none of the environmental impacts associated with the proposed project would be avoided or substantially lessened under the buried tanks alternative, it has been dismissed from further detailed analysis in this EIR.

5.2.2 Treatment and Filtration at Point of Discharge

Under this alternative, the water in Upper Stone Reservoir would not be contained in a buried concrete reservoir or otherwise covered. Instead, water entering the SCRC from upstream supplies would be stored in the existing open reservoir to meet the primary water storage objective of the proposed project by preserving the local storage capability to meet the SCRC service area demand. However, to comply with the LT2ESWTR mandates, the water would receive additional treatment after it was discharged from the reservoir and before it entered the SCRC service area distribution system. Based on the historical average summer day demand for water in the SCRC service area, a treatment capacity of approximately 155 cubic feet per second (cfs) would be necessary. This rate of treatment would require either expanding the existing filtration plant located south of Lower Stone Reservoir or building a new plant near the outlet of Upper Stone Reservoir. Since it was designed primarily to help control the level and quality of the water in Lower Stone Reservoir, the existing filtration plant has the capacity to treat only 10 cfs of water, well below the capacity required to meet summertime demand for drinking water. This plant was completed in late 2008 following nearly 5 years of construction and more than a decade of negotiations with community groups. An approximately 15-fold expansion of its capacity in order to meet the average summer day demand, along with enlargement of ancillary facilities, would be difficult, if not infeasible, to achieve in the necessary timeframe to comply with the LT2ESWTR.

A new treatment facility, either a filtration plant or an ultraviolet light disinfection plant, with enough capacity to meet demand may be difficult to site in the area between Upper and Lower Stone Reservoirs, downstream of the Upper Stone Reservoir point of discharge. If such a facility could feasibly be constructed near the reservoir discharge, construction activity may create environmental impacts related to air quality, noise, and traffic, but these impacts would likely be reduced compared to those associated with the proposed project.

The secondary objective of the proposed project to help restore the natural character of Stone Canyon would not be achieved by this alternative since the existing manmade reservoir would remain in place and a new treatment plant would also be constructed in the canyon. In addition, based on the future LADWP system-wide implementation strategy for the Stage 2 D-DBPR, the water delivered to the SCRC and stored in Upper Stone Reservoir (which would remain uncovered under this alternative) would be treated with chloramines for the purposes of residual disinfection instead of chlorine, the use of which will have been discontinued to avoid the production of carcinogenic chlorine-related disinfection byproducts. While treatment of the reservoir water at the point of discharge may meet the requirements of the LT2ESWTR to reduce the incidence of certain microbial pathogens, leaving Upper Stone Reservoir uncovered would contribute to the degradation of chloramine disinfectant residual and increase the potential for algal blooms. A solution that responds simultaneously to each water quality issue (i.e., the LT2ESWTR mandates and the maintenance of chloramine residual in relation to the Stage 2 D-DBPR mandates) is an essential aspect of any feasible alternative. Since the Stage 2 D-DBPR mandates would not be satisfied, this alternative is considered essentially infeasible and was dismissed from further analysis.

5.2.3 Distribution System Upgrades

Under this alternative, Upper Stone Reservoir would be removed from service as a treated water storage facility, and all drinking water would be provided to the SCRC service area through distribution pipelines alone. Because of the location and pressure requirements of the existing distribution system in the service area, drinking water would still be routed through the SCRC but not through Upper Stone Reservoir itself. In order to provide adequate volumes of water to accommodate peak demand periods in the SCRC service area, a new 84-inch diameter water supply trunk line would need to be constructed from the Van Norman Complex in Granada Hills, from which the SCRC currently receives water. The length of this new trunk line would depend on its actual alignment; however, it would be a minimum of approximately 13 miles long based on the distance between the Van Norman Complex and the SCRC. Upgrades to the Stone Canyon Reservoir Regulating Station, located on Stone Canyon Avenue north of Mulholland Drive, may also be required to accommodate the increased volume of flow provided by the new trunk line.

This alternative would meet the water quality objective of the proposed project because treated drinking water would no longer be stored in the uncovered Upper Stone Reservoir, where it would be subject to contamination in violation of the LT2ESWTR and degradation in the level of chloramines, which would be the secondary residual disinfectant utilized throughout the LADWP drinking water system to implement the Stage 2 D-DBPR. Because peak demand for drinking water in the SCRC service area during non-emergency circumstances would be met through deliveries via the new trunk line, the project objective related to storage capability necessary to maintain water supply reliability and flexibility would be partially achieved. However, the removal of Upper Stone Reservoir from service would eliminate approximately 138 MG of critical local supply capability necessary to meet demand for water during unforeseen emergency outages of upstream supplies or planned outages required for periodic maintenance of upstream supply facilities. This is an essential aspect of the water storage objective of the proposed project that would not be achieved by the distribution system upgrade alternative. Furthermore, unless Upper Stone Reservoir were demolished and backfilled, the secondary objective of the project to help restore the natural character of Stone Canyon would not be achieved by this alternative since the existing manmade reservoir would remain in place. Demolishing and backfilling the reservoir would result in construction-related impacts to air quality, noise, and traffic similar to those created by the proposed project and that would otherwise be substantially reduced or avoided by this alternative.

In addition, although many of the environmental impacts that would occur at the SCRC associated with the proposed project would be reduced or eliminated under this alternative, the construction of the new 84-inch trunk line and regulating station would likely create greater environmental impacts related to traffic, air quality, noise, land use, and other specifically unpredictable factors in neighborhoods along the 13-mile route. Therefore, because the overall environmental impacts associated with the proposed project would merely be geographically shifted but not avoided or substantially lessened under the distribution system upgrade alternative and because critical local supply capability necessary to respond to emergency or scheduled outages of upstream supplies would not be provided, this alternative has been dismissed from further detailed analysis in this EIR.

5.2.4 Upper Stone Reservoir Functional Relocation Alternative

Under this alternative, the drinking water storage function of Upper Stone Reservoir would be relocated to a new covered facility located outside the SCRC in order to meet the primary water quality objective of the proposed project related to the Stage 2 D-DBPR and LT2ESWTR and the primary water storage objective related to maintaining local storage capability. The intent of this alternative would be to avoid the construction-related impacts of the proposed project in Stone Canyon and the immediately surrounding area. However, unless Upper Stone Reservoir were demolished and backfilled, the secondary objective of the project to help restore the natural character of Stone Canyon would not be achieved by this alternative since the existing manmade reservoir would remain in place. Demolishing and backfilling the reservoir would result in significant construction-related impacts to air quality, noise, and traffic similar to those significant impacts created by the proposed project and that would otherwise be substantially reduced or avoided by this alternative.

Because of the location and pressure requirements of the existing distribution system in the SCRC service area, a new covered storage facility would still need to be located in the general vicinity of and at a similar elevation as the existing Upper Stone Reservoir. Many, if not most, areas surrounding the SCRC are encumbered by development that would preclude the construction of a new covered water storage facility of a size comparable to the existing reservoir. While some undeveloped land at a similar elevation to Upper Stone Reservoir exists in several of the canyons that parallel Stone Canyon, most of this property is under private ownership and/or contained within the boundaries of the Santa Monica Mountains National Recreation Area, including designated State Parks land, which would preclude or significantly delay implementation of a new water storage facility and would likely also create potential environmental impacts related to land use. Furthermore, assuming an appropriate site were available for the functional relocation of Upper Stone Reservoir, construction-related impacts to air quality, noise, and traffic would be expected to be generally similar to or even greater than those impacts created by the proposed project, especially given the likely undisturbed character of a new site compared to the existing SCRC and the Upper Stone Reservoir site. Because construction at an alternative site would likely involve undisturbed areas (rather than an existing reservoir site) and may require greater excavation and the construction of support elements, such as roads or laydown areas, impacts to biological resources would also be more extensive than under the proposed project at the SCRC. In addition, even a relocation of the Upper Stone Reservoir function to a site relatively close to the SCRC would require some additions and/or modifications to the existing distribution pipeline infrastructure in order to properly supply the facility and feed the SCRC service area. This would likely result in additional environmental impacts that would not be created by the proposed project. Therefore, because the overall environmental impacts associated with the proposed project would merely be geographically shifted but not avoided or substantially lessened under the Upper Stone Reservoir functional relocation alternative, it has been dismissed from further detailed analysis in this EIR.

5.2.5 No Project Alternative

An evaluation of a No Project Alternative is required under the CEQA Guidelines Section 15126.6(e) to “allow decision makers to compare the impacts of approving the proposed project with the impacts of not approving the proposed project." Under this alternative, no action would be taken relative to improvements at Upper Stone Reservoir or another location to satisfy the project objectives. Upper Stone Reservoir would remain an uncovered treated water reservoir. However, since this would neither meet the regulatory mandates of the LT2ESWTR to protect treated water stored in open reservoirs nor allow for the adequate management of chloraminated water supplies to properly implement the Stage 2 D-DBPR, Upper Stone Reservoir would ultimately need to be removed from service. Because the reservoir would be abandoned but not demolished or buried, the secondary objective of the project to help restore the natural character of Stone Canyon would not be achieved by this alternative. Since the No Project alternative would not satisfy the LT2ESWTR or Stage 2 D-DBPR mandates or provide a reliable local water supply to adequately meet SCRC service area demand for water, it is considered essentially infeasible and has been dismissed from further analysis.

5.3 Alternatives Carried Forward for Detailed Analysis

Based on the environmental analysis conducted for the proposed project, temporary but nonetheless significant and unavoidable impacts would occur to air quality, noise, and traffic related to project construction activities. Significant but mitigable impacts from construction activities have also been identified related to biological resources and cultural resources. Long-term operational impacts related to wildland fires would remain significant and unavoidable even after implementation of mitigation measures. Two feasible alternatives (the installation of a flexible membrane floating cover and a lightweight aluminum cover over Upper Stone Reservoir) that may substantially reduce or avoid the significant impacts of the proposed project have been carried forward for detailed analysis in this EIR. Each of these alternatives would fulfill the primary water storage objective of the proposed project because they would preserve local storage capability to maintain reliability and flexibility to meet the service area demand for drinking water. Unlike the proposed project, neither of the alternatives would actually bury Upper Stone Reservoir. However, because each would provide a cover from the elements for the drinking water stored in the reservoir, they would fulfill the primary water quality objective of the proposed project related to the Stage 2 D-DBPR and LT2ESWTR, allowing for the proper management of chloramine disinfectant levels and limiting contamination by pathogenic microorganisms. Because the water supply facilities would not be buried, neither alternative would fulfill the secondary objective of the proposed project to help restore the natural character of those portions of Stone Canyon. No public access would be provided to the SCRC under these alternatives. The table at the end of this chapter provides a comparison of these alternatives to the proposed project related to impacts. In accordance with the CEQA Guidelines Section 15126.6(d), each alternative was evaluated in sufficient detail to determine whether the associated environmental impacts would be less than, similar to, or greater than the corresponding impacts of the proposed project.

5.3.1 Floating Cover Alternative

Under the floating cover alternative, Upper Stone Reservoir would remain in basically its existing configuration, and an approximately 700,000-square-foot flexible membrane floating cover would be installed over the entire water surface and anchored to the edge of the reservoir basin above the top of water elevation. The floating cover would be larger in area than the surface area of Upper Stone Reservoir itself at the high-water elevation to allow the cover to float on the water surface as the level of the water in the reservoir rises and falls. The cover would be a minimum of 45-mil thick and a maximum of 60-mil thick polypropylene or hypalon material (see Figure 5-1). Although the reservoir liner and appurtenant facilities would be removed and replaced under this alternative, Upper Stone Reservoir would retain essentially its existing shape and volume (approximately 138 MG), providing local storage capacity for the SCRC service area essentially equivalent to the proposed project.

The floating cover would require a minimal amount of ground disturbance and a relatively low level of construction activity. It would be the least expensive means of covering the Upper Stone Reservoir water supply to achieve the LT2ESWTR and Stage 2 D-DBPR objectives of the proposed project (an estimated $35 million versus $140 million for the proposed project over a 60-year lifecycle). Floating covers require more maintenance, including replacement every 15 to 20 years due to deterioration, compared to a buried reservoir, which has a projected lifespan of over 100 years. However, these additional maintenance and replacement costs have been factored into the total life-cycle costs reflected above. The floating cover alternative would require that the reservoir be removed from service for the least amount of time compared to the proposed project (approximately 1.5 years versus 4 years). Unlike under the proposed project, no landslide stabilization in the areas east of the reservoir would be included as part of the floating cover alternative because the cost of repairs and the downtime for the reservoir related to a potential landslide event are considered relatively low.

The floating cover alternative would not achieve the secondary objective of the proposed project to help restore the natural character of those portions of the canyon involved in the project improvements. As discussed in Chapter 2, public access to the SCRC would not be a component of the floating cover alternative.

Construction of this alternative would take approximately 1.5 years to complete. It is anticipated that construction activities would start in 2014 and be completed in 2015. Similar to the proposed project, the general truck route during construction would be between I-405 and the north SCRC entry (at Mulholland Drive) via Skirball Center Drive and Mulholland Drive. No road closures are anticipated during construction, but traffic control measures, such as flag persons, may be required at times to facilitate construction vehicle ingress and egress at the SCRC gate. During construction, water would continue to be provided to the SCRC from the Los Angeles Aqueduct Filtration Plant in Granada Hills. It would be fed to the SCRC service area via a 60-inch line recently installed to bypass Lower Stone Reservoir. Water supplies would be further supplemented as necessary to help temporarily meet peak demand during construction with additional purchases from the Metropolitan Water District.

Construction of the floating cover alternative would consist of several tasks, including mobilization, demolition, construction of a new reservoir liner, and the installation of the floating cover itself. Each of these tasks would require truck deliveries and/or haul trips and the operation of heavy equipment, including excavators, graders, dozers, cranes, and various types of trucks. Construction would be conducted in three basic phases, as described below. A spreadsheet that indicates the type, duration, and level of activities for the various construction tasks is included in Appendix B of this EIR.

Figure 5-1 Flexible Floating Cover Examples

Phase 1: Reservoir Draining, Mobilization, and Reservoir Demolition (4 months)

The first phase of construction would consist of draining Upper Stone Reservoir, mobilizing for construction, and demolishing the existing reservoir and appurtenant facilities. This phase would take approximately 4 months to complete. During Phase 1, the number of on-site workers per day based on a monthly average would range from a low of 17 during mobilization to a peak of 23 during demolition of the reservoir. The number of truck deliveries or haul trips per day based on a monthly average would range from a low of 3 during mobilization to a peak of 34 during demolition of the reservoir. The number of full-time operating equipment per day based on a monthly average would range from a low of 15 during mobilization to a peak of 37 during demolition of the reservoir.

Prior to initiating construction, Upper Stone Reservoir would need to be drained. As under the proposed project, this would initially be accomplished by normal consumption through the drinking water distribution system until the water level reached the lower limit of the normal operating range of the reservoir. After the water reaches the lower limit of the normal operating range, it would take approximately 3 weeks to drain the remaining water from the reservoir and an additional 2 to 3 weeks for the reservoir to dry out. The water collected by the drain system would be directed to Lower Stone Reservoir. This task would involve minor numbers of equipment and personnel. Mobilization would entail widening and stabilizing existing on-site roads as necessary for truck access during construction, preparing construction materials laydown areas and vehicle and equipment parking areas, erecting temporary offices and other support facilities, and establishing temporary electrical power connections. The laydown, office, and parking area would be located in previously disturbed areas north of the reservoir, where similar functions were located during the Lower Stone Reservoir project construction. This task would take approximately 1 month and would occur concurrently with draining the reservoir.

In order for the floating cover to be installed and function properly, the inlet structure and overflow spillway, outlet tower, and outlet tower footbridge would be demolished during Phase 1. In addition, because Upper Stone Reservoir was constructed over 55 years ago, the implementation of the floating cover alternative would represent an opportunity to replace the existing 4-inch thick asphalt liner while the reservoir is drained and out of service. The liner therefore also would be demolished during Phase 1 of construction. Demolition would generate about 9,000 CY of debris, which would be hauled off site.

Phase 2: Construction of Asphalt Reservoir Liner (7 months)

The second phase of construction would consist of relining the reservoir with asphaltic concrete and installing new concrete equipment vaults. This phase of work would take approximately 7 months to complete. During Phase 2, the number of on-site workers per day based on a monthly average would be approximately 34; the number of truck deliveries per day based on a monthly average would be approximately 14; and the number of full-time operating equipment per day based on a monthly average would be approximately 31. Relining Upper Stone Reservoir would require hauling about 21,900 CY of asphalt and aggregate base to the site.

Phase 3: Installation of Floating Cover (4 months)

The third phase of construction would consist of the installation of the floating cover and refilling Upper Stone Reservoir. This phase of work would take approximately 4 months to complete. Limited pieces of equipment would be necessary, including a forklift, generator, drill, air compressor, and various types of trucks. The cover would be installed in sections that would be heat-seamed together. It would be secured with an anchoring system located around the perimeter of the reservoir to apply tension to the cover to keep it aligned and prevent damage from wind. The system would allow the cover to float as the water level in the reservoir fluctuated. During Phase 3, the number of on-site workers per day based on a monthly average would be approximately 20. The number of truck deliveries per day based on a monthly average would be approximately 1; however, more than a single delivery per day would occur at times. The number of full-time operating equipment per day based on a monthly average would be approximately 11. After the floating cover is installed, Upper Stone Reservoir would take approximately 1 month to refill.

Floating Cover Operations

The reconstructed Upper Stone Reservoir with the floating cover would not create the need for LADWP personnel to be located permanently on site. LADWP operations would involve maintenance of the reservoir, pipelines, and ancillary elements at a similar level of activity as current operations at the existing reservoir. Occasional washing of the cover to remove dirt and debris would be necessary to protect the drinking water supply. These operations would generate minimal traffic to and from the site, similar to current levels. Every 15 to 20 years, the floating cover may require replacement, which would entail activity similar to that described under Phase 3. As discussed above, no public access would be provided to the SCRC under this alternative.

Aesthetics

As discussed in Chapter 3.1, publicly available views of Upper Stone Reservoir from the surrounding area are limited to a single public overlook maintained by the Santa Monica Mountains Conservancy, located approximately 0.75 miles east of the SCRC entry on Mulholland Drive. Portions of Upper Stone Reservoir are visible in the middle ground of the view from the overlook, and a relatively small portion of Lower Stone Reservoir is visible in the background. Given the expansiveness of the view of the canyon, the reservoirs are not dominant visual elements from the overlook.

Private views of Upper Stone Reservoir are primarily from residential properties located west of the reservoir, although some views from the north, northeast, and southwest are also available. No individual private property surrounding the SCRC has an unobstructed view of the entire Upper Stone Reservoir due to intervening terrain, vegetation, and structures. Portions of Upper Stone Reservoir are visible in the middle ground of the view from these properties. Upper Stone Reservoir itself, within the context of the canyon, does not represent a dominant visual element.

In contrast to Lower Stone Reservoir, Upper Stone Reservoir is an entirely manmade feature in both structure and appearance. The approximately 14-acre reservoir is tear drop shaped and has continuous, straight edges. An outlet tower approximately 15 feet in diameter projects above the water surface approximately 30 feet near the southwest corner of the reservoir. The tower is connected to the reservoir perimeter road by an approximately 140-foot long footbridge. The water level in the upper reservoir can fluctuate considerably depending on water demand and other factors, exposing or concealing more of the asphalt side walls. The reservoir is surrounded by an approximately 3-foot tall concrete parapet wall. An approximately 8-foot tall chain link fence sits atop the parapet wall. The perimeter of the reservoir is surrounded by an approximately 15- to 20-

foot wide paved maintenance road. This manmade appearance is evident from both the public and private viewpoints of Upper Stone Reservoir.

Implementation of the floating cover alternative would alter the view from the public and private viewpoints of Upper Stone Reservoir by replacing the open water surface with a manmade cover (see Figures 5-2 through 5-5). Although the open water surface water would no longer be visible, Upper Stone Reservoir with the floating cover would be visually similar in character to the existing manmade upper reservoir. Given the general context of the setting in Stone Canyon, the limited views of the existing Upper Stone Reservoir, and the manmade character of the existing upper reservoir, the floating cover alternative would not represent a substantial change to the visual environment and, therefore, would not have a substantial adverse effect on a scenic vista or substantially degrade the existing visual character or quality of the site and its surroundings. The impact to aesthetics from the floating cover would be less than significant.

Figure 5-2 Existing view from Mulholland Drive public overlook

Figure 5-3 Proposed view with floating cover from Mulholland Drive public overlook

Figure 5-4 Existing private view from south-southwest of Upper Stone Reservoir

Figure 5-5 Proposed private view with floating cover from south-southwest of Upper Stone Reservoir

Air Quality/Greenhouse Gas Emissions

Regional Construction Emissions

The floating cover alternative would require significantly less construction activity than the proposed project, and the construction schedule would be approximately 2 to 3 years shorter. It is anticipated that construction activities would start in 2014 and be completed in 2015. The worst case construction emissions would occur during Phase 1 of the construction process. As with the proposed project, daily NO_X, PM_{10}, and $PM_{2.5}$ emissions would exceed the SCAQMD regional significance thresholds. Implementation of mitigation measures AIR-A through AIR-E would be required (see Section 3.2.5 of the EIR), except, because of the earlier construction start date for the floating cover compared to the proposed project (2014 versus 2015), mitigation measure AIR-C would be modified as follows:

- *January 1, 2014, to December 31, 2014*: All off-road diesel-powered construction equipment greater than 50 horsepower shall meet EPA Tier 3 off-road emissions standards. In addition, all construction equipment shall be outfitted with the best available control technology devices certified by CARB. Any emissions control device used by the contractor shall achieve emissions reductions that are no less than what could be achieved by a CARB-defined Level 3 diesel emissions control strategy for a similarly sized engine.
- *Post-January 1, 2015*: All off-road construction diesel engines not registered under CARB’s Statewide Portable Equipment Registration Program and that have a rating of 50 horsepower (hp) or more shall meet, at a minimum, the Tier 4 California Emission Standards for Off-Road Compression-Ignition Engines as specified in California Code of Regulations, Title 13, Section 2423(b)(1) unless such engine is not available for a particular item of equipment. In the event a Tier 4 engine is not available for any off-road equipment larger than 100 hp, that equipment shall be equipped with a Tier 3 engine. Equipment properly registered under and in compliance with CARB’s Statewide Portable Equipment Registration Program shall be considered in compliance with this mitigation measure.

A 5 percent reduction in construction equipment exhaust was used to estimate emissions reductions due to the implementation of mitigation measures AIR-A through AIR-E. As demonstrated in Table 5-1, even with implementation of mitigation, peak regional daily construction emissions would exceed the SCAQMD significance thresholds. Therefore, the floating cover alternative would result in a significant and unavoidable impact. The impact would be similar to the proposed project. However, although the worst-case daily emissions are similar for the floating cover alternative and the proposed project, the floating cover alternative would create substantially lower total project emissions during the construction period due to the nature and length of the construction activities.

Table 5-1 Floating Cover Estimated Peak Regional Daily Construction Emissions – Mitigated

Construction Phase	Pounds Per Day					
	VOC	NO_X	CO	SO_X	$PM_{2.5}$[1]	PM_{10}[1]
Phase 1	20	171	79	<1	55	238
Phase 2	19	144	81	<1	54	238
Phase 3	5	35	26	<1	2	4
Maximum Regional Total	20	171	81	<1	55	238
Significance Threshold	*75*	*100*	*550*	*150*	*55*	*150*
Exceed Threshold?	No	Yes	No	No	Yes	Yes

[1] Emissions for fugitive dust were adjusted to account for a 61 percent control efficiency associated with SCAQMD Rule 403.
Source: Terry A. Hayes Associates 2011.

Localized Construction Emissions

The dispersion modeling results indicate that localized maximum emissions of $PM_{2.5}$, PM_{10}, NO_2, and CO would be only slightly less for the floating cover alternative as for the proposed project. This is because concentrations are directly related to the distance between the source and the sensitive receptor. As with the proposed project, the maximum localized $PM_{2.5}$ and PM_{10} concentrations would exceed the significance thresholds at residential land uses near Upper Stone Reservoir. Therefore, the floating cover alternative would result in a significant impact related to peak localized construction emissions. Even with implementation of mitigation measures AIR-A through AIR-E, construction localized emissions would continue to exceed the SCAQMD localized thresholds for $PM_{2.5}$ and PM_{10} (see Table 5-2). Therefore, similar to the proposed project, the localized construction emissions impact would remain significant and unavoidable under the floating cover alternative. However, over the entire construction period, substantially fewer emissions would be produced under the floating cover alternative than the under proposed project.

Table 5-2 Floating Cover Estimated Peak Localized Construction Emissions – Mitigated

Pollutant	Estimated Emissions (lbs/day)	Concentration at nearest sensitive receptor	Significance Threshold	Significant Impact?
$PM_{2.5}$	53	44 ug/m^3	10.4 ug/m^3	Yes
PM_{10}	237	208 ug/m^3	10.4 ug/m^3	Yes
NO_2	12	0.02 ppm	0.18 ppm	No
CO (1-Hour)	61	0.2 ppm	20 ppm	No
CO (8-Hour)	61	<0.1 ppm	9 ppm	No

Source: Terry A. Hayes Associates 2011.

Toxic Air Contaminants

As with the proposed project, a health risk assessment was completed for the floating cover alternative to determine the risk posed to sensitive receptors from construction activity, particularly diesel emissions. The results of the HRA indicated that construction activities associated with the floating cover alternative would not exceed the estimated carcinogenic risk of 10 persons in one million threshold at any of the nearby sensitive receptor locations, including the closest residential uses to the site, American Jewish University, Roscomare Road Elementary School, and Stephen S. Wise Elementary School. Therefore, unlike the proposed project, construction of the floating cover would result in a less than significant impact related to TACs.

Operational Phase

Operation of the floating cover alternative would not generate any additional daily vehicle trips or create a significant increase in maintenance activities compared to existing conditions because, unlike under the proposed project, no public access would be permitted at the SCRC. Thus, implementation of the floating cover alternative would not create any additional emissions during the operational phase. There would be no operational air quality impact, and the impact would be less than the proposed project.

Greenhouse Gas Emissions

GHG emissions were calculated for construction activity associated with the floating cover alternative. Based on SCAQMD guidance, the emissions summary includes construction emissions averaged over a 30-year span. The floating cover alternative would have no net increases in vehicle traffic during operations, and therefore, only construction emissions are quantified. As shown in Table 5-3, the floating cover alternative would result in 96 metric tons of CO_2e per year. GHG emissions would not exceed the 10,000 metric tons of CO_2e per year significance threshold and would result in a less than significant impact. The impact would be the same as the proposed project (less than significant), although substantially lower total GHG emissions would be produced under the floating cover alternative than the proposed project.

Table 5-3 Floating Cover Estimated Annual Greenhouse Gas Emissions

Source	**Carbon Dioxide Equivalent (Metric Tons per Year)**
Construction Phase 1	1,086
Construction Phase 2	1,526
Construction Phase 3	256
Total Construction Emissions	2,868
Total Construction Emissions Amortized[1]	96
Significance Threshold	*10,000*
Exceed Threshold?	No

[1] Based on SCAQMD guidance, the emissions summary also includes construction emissions amortized over a 30-year span.
Source: Terry A. Hayes Associates 2011.

Construction activity for the floating cover alternative would incorporate source reduction techniques and recycling measures to divert waste from landfills. As with the proposed project, the floating cover alternative would not conflict with any state or local climate change policy or regulation.

Biological Resources

The floating cover alternative would disturb a considerably smaller area than the proposed project. Under the floating cover alternative construction activities would generally be confined to the existing Upper Stone Reservoir. This alternative would not require implementation of the landslide stabilization on the east slope above Upper Stone Reservoir and would not require a stockpile area. As a result, the floating cover alternative would not remove or disturb sensitive plant species and vegetation communities located within the vicinity of Upper Stone Reservoir. Therefore, there would be no impact to sensitive species. No tree removal would be required as part of this alternative. Therefore, there would be no impact to trees protected by the City's Tree Protection Ordinance. This alternative does not involve vegetation removal, and therefore, would not impact migratory bird species. Because no public access would be permitted under the floating cover alternative, long-term impacts to sensitive wildlife and plant species would not occur.

Cultural Resources

As discussed in Chapter 3.4, Upper Stone Reservoir was evaluated for its eligibility for the California Register and the National Register. It was determined that Upper Stone Reservoir is not eligible for listing as a historic resource. Thus, further modification of the upper reservoir to construct the floating cover alternative would have a less than significant impact on historic resources.

Ground disturbing activities would include demolishing and replacing the existing asphalt liner in Upper Stone Reservoir. Minimal ground disturbing activities outside the footprint of Upper Stone Reservoir would occur under the floating cover alternative. Compared to the proposed project, the floating cover alternative would involve substantially less ground-disturbing activity within the SCRC and would not be likely to disturb previously unearthed archaeological resources. The impact to archaeological resources would be less than significant, and no mitigation is required. As with the proposed project, the impacts to paleontological resources would be less than significant.

Wildland Fire

Unlike the proposed project, which would provide passive recreation in the form of limited trails access within portions of the SCRC, public access to the complex property would not be permitted as part of the floating cover alternative. Operations at the SCRC would be similar to existing conditions. As such, there would not be an increased risk of loss from wildland fire.

Land Use

Unlike the proposed project, which would provide a vegetated area in place of Upper Stone Reservoir, the floating cover alternative would be inconsistent with the existing OS zoning designation of the reservoir property. Open reservoirs are an allowable use within the OS zone. Appurtenant facilities that are incidental to the operation and continued maintenance of such reservoirs are also permitted within the OS zone under the provisions of a Conditional Use

Permit. However, a floating cover is not considered an appurtenant use, but a replacement of an open reservoir with a covered storage facility. The implementation of the floating cover alternative would require a zoning variance for the SCRC property. With a zoning variance, the impact to land use from the floating cover alternative would be less than significant.

Noise

On-site Construction Noise

As with the proposed project, some construction activity would occur inside the drained upper reservoir, which would attenuate construction noise due to the “line-of-sight” factor of the noise source. However, for the purposes of providing a conservative analysis, a reduction for below ground construction was not taken into account in the determination of impact. Construction activity associated with the floating cover alternative would generally be less intense than the activity associated with the proposed project. However, the floating cover alternative and the proposed project would use similar types and numbers of equipment during certain phases of construction. Therefore, maximum construction noise would be the same. Construction noise levels related to the floating cover construction would not exceed the 5-dBA significance threshold at nearby sensitive receptors. The impact would be less than significant.

Similar to the proposed project, haul truck noise on the interior site access road would increase ambient noise levels in surrounding areas above the City’s thresholds. Because the background existing noise levels within the SCRC are so low since the majority of the SCRC is undeveloped, haul truck noise along the interior site access road would be more audible to nearby sensitive receptors than haul truck trips that would occur on the heavily trafficked Mulholland Drive. Therefore, on-site truck noise would result in a significant impact, and the implementation of mitigation measures NOISE-A and NOISE-B would be required (see Section 3.6.5). Even with implementation of mitigation measures, the noise levels would remain above the City’s standards, and the on-site haul truck noise impact would be significant and unavoidable. However, the duration of construction would be substantially shorter and the total number of truck trips would be substantially fewer under the floating cover alternative than under the proposed project.

Off-site Construction Noise

Under the floating cover alternative, haul trucks would use the same route as the proposed project. The nearest sensitive land use to the construction haul route would be the residences located on Mulholland Drive, American Jewish University, and Stephen S. Wise Elementary School. Existing and floating cover noise levels were calculated based on the FHWA RD-77-108 noise calculation formulas. Table 5-4 shows the estimated noise levels at sensitive receptors located along the haul route.

Table 5-4 Floating Cover Off-site Construction Haul Route Noise Levels

Sensitive Receptor	Existing Ambient (dBA, CNEL)	New Ambient (dBA, CNEL)	Increase
Residences along Mulholland Drive	70.0	72.5	2.5
American Jewish University	69.8	72.4	2.6
Stephen S. Wise Elementary School	69.8	72.4	2.6

Note: Truck noise levels were adjusted by 2 dB to account for the roadway gradient.
Source: Terry A. Hayes Associates 2011.

As shown in Table 5-4 above, modeled existing noise levels were estimated to be approximately 69.8 dBA at each segment analyzed. Future ambient noise levels would be about 72.4 dBA. Similar to the proposed project, haul route truck noise under the floating cover alternative would not exceed the 5-dBA significance threshold. The off-site haul truck noise impact would be less than significant. In addition, the duration of haul truck trips and total number of truck trips would be substantially lower for the floating cover alternative compared to the proposed project.

Operational Noise

Unlike the proposed project, the floating cover alternative would not include passive recreation within portions of the SCRC. Therefore, there would be no increase in vehicle trips to and from the site. Thus, there would be no incremental increase in noise levels associated with operation of the floating cover alternative.

Groundborne Vibration

The use of heavy equipment (e.g., a large bulldozer) would generate vibration levels of 0.089 inches per second at a distance of 25 feet. In addition, the floating cover alternative would increase truck traffic along the project haul route. As with the proposed project, vibration levels at the nearest sensitive receptors would not exceed the potential building damage threshold of 0.3 inches per second. Therefore, the floating cover alternative, like the proposed project, would result in a less than significant impact related to construction vibration.

The operation of the floating cover alternative would not include substantial stationary sources of groundborne vibration, such as heavy equipment operations. Operational groundborne vibration in the project vicinity would be generated by vehicular travel on the local roadways. However, similar to existing conditions, project-related traffic vibration levels would not be perceptible by sensitive receptors. Therefore, the floating cover alternative, like the proposed project, would result in a less than significant impact related to operational vibration.

Transportation and Traffic

Study Intersection Construction Analysis

The floating cover alternative would be constructed in three phases over approximately 1.5 years. Trip generation for employees and trucks would vary depending on the phase of construction. Table 5-5 provides the peak hour trip generation calculations for the floating cover construction scenario, based on the number of on-site employees and the number of daily truck trips during the peak of activity, which would occur in Phase 1 of construction.

Table 5-5 Daily Construction One-Way Trip Generation Calculations for Floating Cover Alternative

Generator	Daily	Weekday AM Total	Weekday AM In	Weekday AM Out	Weekday PM Total	Weekday PM In	Weekday PM Out
Employees[1]	46	23	23	0	23	0	23
Trucks[2]	170	21	11	10	21	11	10
Total	*216*	*44*	*34*	*10*	*44*	*11*	*33*

[1] Employee trips = 1 person/vehicle
[2] Vehicle trips = 2.5 passenger car equivalent x truck trips
Source: KOA Corporation 2011.

The number of employee trips was based on the assumption that all 23 employees would arrive within the morning peak hour and depart within the evening peak hour. The number of truck trips was based on a typical 8-hour shift, with delivery truck trips distributed throughout the day. Based on a daily total of 170 truck trips (68 trucks at the 2.5 passenger car equivalent factor), 21 truck trips would occur during both the morning and evening peak hours. The total construction trip generation with passenger car equivalent factor would be 216 daily trips, of which 44 trips would occur during each of the peak hours.

Vehicle trips generated by the floating cover alternative were added to background traffic volumes that would occur without implementation of a project. Tables 5-6 and 5-7 provide a summary of the construction period study intersection impact analysis for the floating cover alternative during the morning and evening peak periods. The LOS calculation worksheets for this analysis are provided in Appendix G.

Table 5-6 Floating Cover Study Intersection LOS – AM Peak Hour

#	Intersection	2010		Future Without Project (2014)		Future With Project (2014)		Diff.	Sig. Impact?
		V/C	LOS	V/C	LOS	V/C	LOS		
1	Roscomare Road/Mulholland Drive	0.677	B	0.720	C	0.744	C	0.024	NO
2	Casiano Road/Mulholland Drive	0.620	B	0.661	B	0.685	B	0.024	NO
3	Skirball Center Drive/Mulholland Drive	0.888	D	0.938	E	0.945	E	0.007	NO
4	Skirball Center Drive/I-405 Northbound Ramps	0.799	C	0.838	D	0.846	D	0.008	NO
5	Skirball Center Drive /I-405 Southbound Ramps	0.621	B	0.659	B	0.675	B	0.016	NO

Note: All study intersections are equipped with ATSAC and ATCS capability. Per LADOT policies, a 0.100 V/C reduction has been applied to all calculations.
Source: KOA Corporation 2011.

Table 5-7 Floating Cover Study Intersection LOS – PM Peak Hour

#	Intersection	2010		Future Without Project (2014)		Future With Project (2014)		Diff.	Sig. Impact?
		V/C	LOS	V/C	LOS	V/C	LOS		
1	Roscomare Road/Mulholland Drive	0.506	A	0.552	A	0.575	A	0.023	NO
2	Casiano Road/Mulholland Drive	0.394	A	0.433	A	0.441	A	0.008	NO
3	Skirball Center Drive/Mulholland Drive	0.640	B	0.691	B	0.714	C	0.023	NO
4	Skirball Center Drive/I-405 Northbound Ramps	0.545	A	0.578	A	0.590	A	0.012	NO
5	Skirball Center Drive /I-405 Southbound Ramps	0.503	A	0.543	A	0.559	A	0.016	NO

Note: All study intersections are equipped with ATSAC and ATCS capability. Per LADOT policies, a 0.100 V/C reduction has been applied to all calculations.
Source: KOA Corporation 2011.

As shown in Tables 5-6 and 5-7, above, all of the study intersections would operate at acceptable levels during construction of the floating cover alternative. Unlike the proposed project, the impact to the study intersections under the floating cover alternative would be less than significant.

Study Roadway Segment Construction Analysis

In addition, peak hour traffic impacts were analyzed at the study roadway segments to determine potentially significant impacts. Table 5-8 summarizes the peak-hour volumes that would occur throughout the day. The LOS calculation worksheets for this analysis are provided in Appendix G.

Based on the results shown in Table 5-8, construction of the floating cover alternative would create significant impacts at Mulholland Drive, between Woodcliff Road and Antelo Place, and Mulholland Drive, between Roscomare Road and Casiano Road. The decrease in service at intersections designated as E or F would result in a significant impact, and implementation of mitigation measures TRANS-A and TRANS-B (see Section 3.7.3) is required. However, the floating cover alternative would create substantially fewer average and peak construction-related daily vehicle trips compared to the proposed project, and one fewer study roadway segment would be significantly impacted under this alternative compared to the proposed project.

Truck traffic during the peak and throughout the course of construction of the floating cover would be substantially less than under the proposed project. However, similar to the proposed project, construction traffic exiting the SCRC onto Mulholland Drive would nonetheless pose a potential safety hazard to motorists on Mulholland Drive. Implementation of mitigation measures TRANS-B and TRANS-D would be required to reduce the impact to a less than significant level.

Table 5-8 Floating Cover Peak Hour Weekday Roadway Segment Volumes (2014)

Study Roadway Segment	Base Volumes								Proposed Project				
	2010			Ambient Growth	Area Projects	Future Base			Construction Only	Future With Construction			
	Volume	V/C	LOS			Volume	V/C	LOS		Volume	V/C	LOS	% Share
Mulholland Drive between Nicada Drive & Stone Canyon Road	1,338	1.070	F	4%	58	1,450	1.160	F	0	1,450	1.160	F	0.0
Mulholland Drive between Woodcliff Road & Antelo Place	1,225	0.980	E	4%	58	1,332	1.066	F	46	1,378	1.102	F	3.7
Mulholland Drive between Roscomare Road & Casiano Road	1,564	0.834	D	4%	58	1,685	0.899	D	46	1,731	0.923	E	3.0
Skirball Center Drive between Mulholland Drive & I-405 NB Ramps	1,999	0.799	C	4%	58	2,138	0.855	D	46	2,184	0.874	D	2.3
Skirball Center Drive between Skirball Center Drive & I-405 SB Ramps	1,386	0.554	A	4%	37	1,479	0.592	A	23	1,502	0.601	B	1.6

Source: KOA Corporation 2011.

2008 Baseline With Floating Cover

To also incorporate analysis consistent with recent CEQA case law, this analysis considers traffic conditions based on a 2008 baseline (when the proposed project NOP was issued) with the addition of traffic expected during the peak phase of construction (phase of construction involving the greatest number of vehicle trips to and from the site). Using the same trip generation and trip distribution assumptions described above, the study intersection operations for the 2008 baseline with the floating cover are summarized in Table 5-9 for the morning peak hour and Table 5-10 for the evening peak-hour. The LOS calculation worksheets for this analysis are provided in Appendix G.

Table 5-9 2008 Baseline With Floating Cover Study Intersection LOS – AM Peak Hour

#	Intersection	2008 Baseline		2008 Baseline With Project		Diff.	Sig. Impact?
		V/C	LOS	V/C	LOS		
1	Roscomare Road/Mulholland Drive	0.688	B	0.712	C	0.024	NO
2	Casiano Road/Mulholland Drive	0.631	B	0.655	B	0.024	NO
3	Skirball Center Drive/Mulholland Drive	0.903	E	0.910	E	0.007	NO
4	Skirball Center Drive/I-405 Northbound Ramps	0.813	D	0.821	D	0.008	NO
5	Skirball Center Drive /I-405 Southbound Ramps	0.632	B	0.647	B	0.015	NO

Note: All study intersections are equipped with ATSAC and ATCS capability. Per LADOT policies, a 0.100 V/C reduction has been applied to all calculations.
Source: KOA Corporation 2011.

Table 5-10 2008 Baseline With Floating Cover Study Intersection LOS – PM Peak Hour

#	Intersection	2008		2008 Baseline With Project		Diff.	Sig. Impact?
		V/C	**LOS**	**V/C**	**LOS**		
1	Roscomare Road/Mulholland Drive	0.515	A	0.538	A	0.023	NO
2	Casiano Road/Mulholland Drive	0.402	A	0.410	A	0.008	NO
3	Skirball Center Drive/Mulholland Drive	0.651	B	0.674	B	0.023	NO
4	Skirball Center Drive/I-405 Northbound Ramps	0.555	A	0.568	A	0.013	NO
5	Skirball Center Drive /I-405 Southbound Ramps	0.512	A	0.528	A	0.016	NO

Note: All study intersections are equipped with ATSAC and ATCS capability. Per LADOT policies, a 0.100 V/C reduction has been applied to all calculations.
Source: KOA Corporation 2011.

As shown in Tables 5-9 and 5-10 above, all of the study intersections would operate at acceptable levels when construction traffic is added to 2008 baseline traffic volumes. Unlike the proposed project, the impact to the study intersections under the floating cover alternative would be less than significant.

In addition, peak hour traffic impacts were analyzed at the study roadway segments to determine potentially significant impacts compared to 2008 baseline conditions. Table 5-11 summarizes the peak-hour volumes that would occur throughout the day. The LOS calculation worksheets for this analysis are provided in Appendix G.

Table 5-11 Floating Cover 2008 Baseline Peak Hour Weekday Roadway Segment Volumes

Study Roadway Segment	2008			Construction Only	2008 Baseline With Construction			
	Volume	V/C	LOS		Volume	V/C	LOS	% Share
Mulholland Drive between Nicada Drive & Stone Canyon Road	1,358	1.086	F	0	1,358	1.086	F	0.0
Mulholland Drive between Woodcliff Road & Antelo Place	1,243	0.994	E	46	1,289	1.031	F	1.8
Mulholland Drive between Roscomare Road & Casiano Road	1,588	0.847	D	46	1,634	0.871	D	1.4
Skirball Center Drive between Mulholland Drive & I-405 NB Ramps	2,029	0.812	D	46	2,075	0.830	D	1.1
Skirball Center Drive between I-405 SB and NB Ramps	1,407	0.563	A	23	1,430	0.572	A	0.8

Source: KOA Corporation 2011.

Based on the results shown in Table 5-11, construction of the floating cover alternative would create significant impacts at Mulholland Drive between Woodcliff Road and Antelo Place. The decrease in service at intersections designated as E or F would result in a significant impact, and implementation of mitigation measures TRANS-A and TRANS-B (see Section 3.7.3) is required. However, the floating cover alternative would create substantially fewer average and peak construction-related daily vehicle trips compared to the proposed project, and one fewer study roadway segment would be significantly impacted under this alternative compared to the proposed project.

CMP Construction Analysis

The peak phase of construction activity (Phase 1) for the floating cover alternative would add fewer than 50 trips to the I-405 on- and off-ramps at Skirball Center Drive. Unlike the proposed project, the impact to these CMP facilities would be less than significant, and no mitigation is required. Further, the floating cover alternative would not add more than 150 new trips per hour to any freeway segments near the project site. Like the proposed project, the impact would be less than significant.

Operations Phase

Unlike under the proposed project, no public access for recreation would be provided at the SCRC as part of the floating cover alternative. Operation of the floating cover alternative would be similar to the existing uncovered Upper Stone Reservoir. There would be no increase in vehicle trips to and from the SCRC along Mulholland Drive. No impact would occur to transportation and traffic during operation of the floating cover alternative.

Summary of Conclusions

Under the floating cover alternative, Upper Stone Reservoir, although relined, would be retained in essentially its same configuration, and LADWP would install an approximately 700,000-square-foot flexible membrane floating cover over the entire water surface and secure it to the edge of the reservoir basin at the roadway elevation. Under this alternative, the SCRC would remain under the control of LADWP, and no public access to the site would be provided. Construction of the floating cover alternative would take approximately 1.5 years to complete. As with the proposed project, the floating cover alternative would meet the two primary project objectives. The floating cover alternative would comply with updated water quality regulations, and it would maintain local drinking water storage capacity within the SCRC service area. However, this alternative would not meet the secondary project objective of helping to restore the natural character of those portions of Stone Canyon involved in the project improvements.

The following summarizes the potential environmental impacts that would be created by the floating cover alternative compared to those that would be created by the proposed project.

Aesthetics

- Neither the floating cover alternative nor the proposed project would create a significant impact to a scenic vista.
- Neither the floating cover alternative nor the proposed project would create a significant impact by substantially degrading the existing visual character or quality of the site and its surroundings.

Air Quality

- The floating cover alternative, like the proposed project, would create significant and unavoidable regional air quality impacts during certain periods of the construction phase. However, the floating cover alternative would result in lower peak emissions and substantially lower emissions over the entire construction period compared to the proposed project.
- The proposed project would create a less than significant regional air quality impact related to post-construction project operations. Because the floating cover alternative would generate no additional post-construction traffic or maintenance activity at the SCRC from passive recreation use, it would create no impacts related to regional air pollutant emissions during post-construction operations.
- The floating cover alternative would result in similar peak localized air pollutant concentrations but lower peak TAC emissions during construction compared to the proposed project. However, the floating cover alternative, like the proposed project, would create a significant and unavoidable impact related to localized air pollutant emissions of PM_{10} and $PM_{2.5}$ during certain periods of the construction phase. It would result in substantially lower air pollutant concentrations and TAC emissions over the entire construction period. Unlike the proposed project, the TAC emissions would be less than significant under the floating cover alternative.
- The proposed project would create a less than significant impact related to localized air pollutant emissions and TACs during post-construction project operations. Because the floating cover alternative would generate no additional post-construction traffic or

maintenance activity at the SCRC from passive recreation use, it would create no impacts related to localized air pollutant emissions or TACs during post-construction operations.

- Neither the proposed project nor the floating cover alternative would create a significant impact related to GHG emissions from either construction or operations. However, the floating cover alternative would create substantially lower GHG emissions during construction and operations when compared to the proposed project.

Biological Resources

- Unlike the proposed project, the floating cover alternative would not create significant direct impacts related to sensitive plant and wildlife species, nor would it conflict with local tree protection ordinances or impact migratory birds. No impacts to biological resources would occur.
- Unlike the proposed project, because no recreation activity at the SCRC would be provided, no long-term impacts to sensitive plant and wildlife species would occur during operation of the floating cover alternative.

Cultural Resources

- Unlike the proposed project, the floating cover alternative would not create significant impacts related to ground disturbing activities that have the potential to uncover previously unearthed archaeological resources because construction would be confined essentially to the existing reservoir footprint. The impact would be less than significant.
- Both the proposed project and floating cover alternative would have less than significant impacts to historic resources and paleontological resources.

Wildland Fire

- Unlike the proposed project, the floating cover alternative would not include public access within portions of the SCRC during post-construction operations. As such, there would be no increased risk of loss from wildland fire.

Land Use

- Unlike the proposed project, the floating cover alternative would require a zoning variance for the SCRC.

Noise

- Both the floating cover alternative and the proposed project would create a less than significant impact related to on-site construction equipment noise. However, both the proposed project and the floating cover alternative would create a significant noise impact associated with on-site haul truck trips. Even with implementation of mitigation measures NOISE-A and NOISE-B, the impact would remain significant and unavoidable. However, over the entire period of construction, the floating cover alternative would create less noise than the proposed project because of the nature and duration of the construction activities.
- Both the proposed project and the floating cover alternative would have a less than significant mobile noise impact associated with haul truck trips to and from the SCRC. However, the impact under the floating cover alternative would be less than under the proposed project because the duration of construction would be shorter and there would be fewer construction haul truck trips overall.

- The proposed project would create a less than significant impact related to noise during post-construction project operations. Because the floating cover alternative would generate no additional post-construction traffic or maintenance activity at the SCRC from passive recreation use, it would create no impact related to noise during post-construction operations.

Transportation and Traffic

- The floating cover alternative would create substantially fewer average and peak construction-related daily vehicle trips compared to the proposed project. Unlike the proposed project, the floating cover alternative would not create a significant impact related to level of service at the study intersections during construction.
- Both the floating cover alternative and the proposed project would create a significant impact to the level of service on the study roadway segments during construction. However, the floating cover alternative would create substantially fewer average and peak construction-related daily vehicle trips compared to the proposed project.
- Both the floating cover alternative and the proposed project would create significant impacts related to potential safety hazards to vehicles traveling on Mulholland Drive near the SCRC gate, primarily from trucks exiting the site. With the implementation of mitigation measures TRANS-B and TRANS-D, these impacts would be reduced to a less than significant level under both the floating cover alternative and the proposed project. However, the floating cover alternative would create substantially fewer average and peak construction-related vehicle trips compared to the proposed project.
- Because the floating cover alternative would not provide public access to the SCRC for passive recreation, the potential safety hazard at the Mulholland gate during the operations phase would be eliminated.
- Unlike the proposed project, the floating cover would not create a significant impact to CMP facilities in the project vicinity during construction.
- The proposed project would create a less than significant impact related to traffic and parking during post-construction project operations. Because the floating cover alternative would generate no additional post-construction traffic or maintenance activity at the SCRC from passive recreation use, it would create no impact related to traffic and parking during post-construction operations.

5.3.2 Aluminum Cover Alternative

Under the aluminum cover alternative, Upper Stone Reservoir would remain in basically its existing configuration, and a lightweight aluminum cover would be installed over the entire surface of the reservoir. The aluminum cover structure would consist of a standing seam roof, situated several feet above the water surface, resting on concrete side walls (see Figure 5-6). Although the reservoir liner and appurtenant facilities would be removed and replaced under this alternative, Upper Stone Reservoir would retain essentially its existing shape and volume (approximately 138 MG minus an insignificant volume lost to the roof support columns), providing local storage capacity for the SCRC service area essentially equivalent to the proposed project.

Figure 5-6 Aluminum Cover Examples

The aluminum cover would create less ground disturbance and require less construction activity than the proposed project. It would also be a less expensive means than the proposed project to cover the Upper Stone Reservoir water supply to achieve the LT2ESWTR and Stage 2 D-DBPR mandates (an estimated $80 million versus $140 million for the proposed project over a 60-year lifecycle). The aluminum cover would require approximately 3.5 years for construction compared to 4 years for the proposed project. The aluminum cover would be less durable than the buried reservoir, but still require relatively little maintenance or replacement of components. Similar to the floating cover alternative, the aluminum cover alternative would not achieve the secondary objective of the proposed project to help restore the natural character of those portions of the canyon involved in the project. Likewise, public access to the SCRC would not be a component of the aluminum cover alternative.

The slopes immediately east of the upper reservoir have experienced several relatively recent and moderately significant landslides. If a similar landslide were to occur in this area after the implementation of the aluminum cover alternative, the structure could be severely damaged. Because of the relatively significant cost of the aluminum cover and because repairs necessitated by such a landslide event could remove the reservoir from service for a relatively lengthy period and require major construction activity and investment, including entirely rebuilding the aluminum cover, the slopes east of the reservoir must be stabilized as part of this alternative, similar to the proposed project. The potential landslide areas encompass approximately 20 acres in three separate zones (see Figure 2-6).

Columns would be necessary to support the aluminum cover, including some that would need to be located within the earth dam at the southern end of the reservoir. However, the relatively small number of columns that would penetrate the dam (approximately 30), combined with the relatively light weight of the aluminum cover, would not compromise the structural integrity of the dam, even during seismic events.

Construction of this alternative would take approximately 3.5 years to complete. It is anticipated that construction activities would start in 2014 and be completed in 2018. Similar to the proposed project, the general truck route during construction would be between I-405 and the north SCRC entry (at Mulholland Drive) via Skirball Center Drive and Mulholland Drive. No road closures are anticipated during construction, but traffic control measures, such as flag persons, may be required at times to facilitate construction vehicle ingress and egress at the SCRC gate. During construction, water would continue to be provided to the SCRC from the Los Angeles Aqueduct Filtration Plant in Granada Hills. It would be fed to the SCRC service area via a 60-inch line recently installed to bypass Lower Stone Reservoir. Water supplies would be further supplemented as necessary to help temporarily meet peak demand during construction with additional purchases from the Metropolitan Water District.

Construction of the aluminum cover alternative would consist of several tasks, including mobilization, demolition, landslide stabilization, construction of a new reservoir liner, and the installation of the aluminum cover itself. Each of these tasks would require truck deliveries and/or haul trips and the operation of heavy equipment, including excavators, graders, dozers, cranes, and various types of trucks. Construction would be conducted in four basic phases, as described below. A spreadsheet that indicates the type, duration, and level of activities for the various construction tasks is included in Appendix B of this EIR.

Phase 1: Reservoir Draining, Mobilization, Reservoir Demolition, and Landslide Stabilization (4 months)

The first phase of construction for the aluminum cover alternative would be the same as that for the proposed project, consisting of draining Upper Stone Reservoir, mobilizing for construction, demolishing the existing reservoir and appurtenant facilities, and initiating the stabilization of potential landslide areas east of the reservoir. This phase would take approximately 4 months to complete. During Phase 1, the number of on-site workers per day based on a monthly average would range from a low of 17 during mobilization to a peak of 48 during the concurrent stabilization of the landslide areas and the demolition of the reservoir. The number of truck deliveries or haul trips per day based on a monthly average would range from a low of 3 during mobilization to a peak of 79 during the concurrent stabilization of the landslide areas and the demolition of the reservoir. The number of full-time operating equipment per day based on a monthly average would range from a low of 15 during mobilization to a peak of 69 during the concurrent stabilization of the landslide areas and the demolition of the reservoir.

Prior to initiating construction, Upper Stone Reservoir would need to be drained. As under the proposed project, this would initially be accomplished by normal consumption through the drinking water distribution system until the water level reached the lower limit of the normal operating range of the reservoir. After the water reaches the lower limit of the normal operating range, it would take approximately 3 weeks to drain the remaining water from the reservoir and an additional 2 to 3 weeks for the reservoir to dry out. This task would involve minor equipment and numbers of personnel. The mobilization task, including preparing materials laydown, office, and parking areas (which would be located north of the reservoir) would take approximately 1 month and would occur concurrently with draining Upper Stone Reservoir.

In order for the aluminum cover to be installed and function properly, the inlet structure and overflow spillway, outlet tower, outlet tower footbridge, and reservoir parapet wall would be demolished during Phase 1. In addition, because Upper Stone Reservoir was constructed over 55 years ago, implementation of the aluminum cover alternative would represent an opportunity to replace the existing 4-inch thick asphalt liner while the reservoir is drained and out of service. The liner therefore also would be demolished during Phase 1 of construction. Demolition would generate about 9,000 CY of debris, which would be hauled off site.

This phase of construction would also include stabilization of the landslide area located east of the reservoir. This would involve an approximately 3.5 acre area that would be fully graded, resulting in the excavation of approximately 46,500 CY of earth, which would include approximately 2,300 CY of topsoil (± 6 inches in depth) that would be removed from the graded area, stockpiled, and returned after excavation activities are complete to provide an appropriate medium for replanting the area. The balance of the excavated material (44,200 CY) would be hauled off site and recycled or disposed with the demolition debris.

In addition, approximately 17 more acres susceptible to landslides would be stabilized using soil nails to avoid excavation that may need to extend well above the uphill boundary of the slide zones, creating a considerably larger area of impact. Approximately 20 rows of nails, driven 15 to 75 feet deep, would be required. In order to install the nails, several temporary parallel roads across the slope would be necessary to provide access for heavy equipment. The area around each nail would also need to be cleared of vegetation. Excavation and grading in limited areas may also be necessary within these two slide zones to provide stability. Approximately 2,400 CY of topsoil would be temporarily removed from the area and stockpiled, to be returned after stabilization activities are complete to provide an appropriate medium for replanting in disturbed areas. The landslide stabilization task would take a total of approximately 5 months to complete, the first 3 months of which would take place concurrently with the Upper Stone Reservoir demolition task during Phase 1.

Phase 2: Landslide Stabilization and Construction of Asphalt Reservoir Liner (7 months)

The second phase of construction would involve completing the landslide stabilization task, relining the reservoir with asphaltic concrete and installing concrete vaults. This phase of work would take approximately 7 months to complete. During Phase 2, the number of on-site workers per day based on a monthly average would range from a low of 24 to a peak of 49. The number of truck deliveries or haul trips per day based on a monthly average would range from a low of 14 to a peak of 60. The number of full-time operating equipment per day based on a monthly average would range from a low of 26 to a peak of 59. Relining the reservoir would require hauling about 21,900 CY of asphalt and aggregate base to the site.

Phase 3: Aluminum Cover Construction (26 months)

The third phase of construction would consist of the construction of the aluminum cover. It would include construction of caisson foundations (for the roof support columns), reinforced concrete columns, and concrete perimeter wall, as well as the delivery and installation of the roof truss system and aluminum decking. This phase of work would take approximately 26 months to complete. Throughout Phase 3, the number of on-site workers per day based on a monthly average would be approximately 27. The number of truck deliveries per day based on a monthly average would be approximately 4. The number of full-time operating equipment per day based on a monthly average would be approximately 20. After the aluminum cover construction is completed, Upper Stone Reservoir would take approximately 1 month to refill, which would occur concurrently with Phase 4.

Phase 4: Replanting Landslide Stabilization Areas (2 months)

The fourth phase of construction would consist of replanting the approximately 20-acre area east of the reservoir disturbed by the landslide stabilization task. This phase of work would take approximately 2 months to complete. The landscaping would include a combination of seeding and individual specimens, both shrubs and trees. A temporary irrigation system would be installed to ensure successful establishment of new plant material. During Phase 4, the number of on-site workers per day based on a monthly average would be approximately 11. The number of truck deliveries per day based on a monthly average would be approximately 2. The number of full-time operating equipment per day based on a monthly average would be approximately 8.

Aluminum Cover Operations

The reconstructed Upper Stone Reservoir with the aluminum cover would not create the need for LADWP personnel to be located permanently on site. LADWP operations on site would involve maintenance of the reservoir, pipelines, and ancillary elements at a similar level of activity as current operations at the existing reservoir. Little actual maintenance of the aluminum cover itself is necessary. These operations would generate minimal traffic to and from the site, similar to current levels. As discussed above, no public access would be provided to the SCRC under this alternative.

Solar Panel Option

In an effort to help meet LADWP's ongoing commitment to renewable energy production to provide for the electrical power needs of the City, an option to install solar photovoltaic (PV) panels on the aluminum cover at Upper Stone Reservoir is under consideration. A solar energy option is not under consideration for the floating cover alternative because incompatibilities between the floating cover and the solar components would hinder operations and maintenance and compromise the integrity of both the water storage and solar energy systems. A solar energy option is not under consideration for the buried reservoir (the proposed project) because it would be contrary to the secondary objective of the project to help restore the natural character of those portions of the canyon involved in the improvements required to meet the primary water quality and water supply objectives of the proposed project. The solar panel option would extend the construction period for the aluminum cover alternative from approximately 3.5 years to 4 years.

In November 2008, the City initiated a new solar energy plan known as Solar LA that establishes a goal of developing 1,280 megawatts (MW) of solar energy by 2020, enough to serve about 10 percent of Los Angeles' electrical power demands. Solar LA consists of several program areas, including customer programs, LADWP in-City solar projects, and large-scale solar projects outside of the City boundaries. LADWP manages the country's most successful municipal utility customer solar incentive program, encouraging customers to install over 19 MW of solar power in Los Angeles since 1999. LADWP is also continuing to plan for the development of several large-scale solar power generation facilities in the region.

To effectively and efficiently meet the goal of in-City solar projects, LADWP is focusing on sites that provide an opportunity for large-scale rooftop and ground mounted installations. Upper Stone Reservoir, which is located on City-owned property and offers several acres of generally unshaded area, provides such an opportunity. The Upper Stone solar facility would create approximately 5 MW of power generation, enough to provide for the annual electrical energy needs of over 1,500 households in the City.

The installation of the solar panels would represent an additional phase of construction that would occur after the construction of the aluminum cover itself. As such, the potential environmental impacts of construction and operation of the aluminum cover alternative (without the solar panel component) can be considered separately, and the impacts associated with construction and operation of the solar panel option can then be considered additionally along with any impacts related to the aluminum cover alternative.

Phase 5: Solar Panel Installation (7 months)

The construction of the solar panels involves several distinct tasks, which would generally be completed concurrently, including the actual panel installation and wiring, the installation of power inverters and transformers, and the interconnection of the solar power facility to the City distribution system. The total construction time for this phase would be approximately 7 months. The individual solar photovoltaic panels would measure approximately 6 feet by 4 feet (see Figure 5-7). The panels may be installed flat on the aluminum cover surface or at a slight angle from horizontal, depending on which configuration provides the greatest efficiency relative to power generation for the entire system. Flat installations minimize shadows that interfere with solar energy collection, but they are also oriented less favorably to most effectively collect solar radiation. The determination regarding the angle of the panels would be made during detailed design, but it would not affect the overall nature of the solar installation.

Figure 5-7 Solar Photovoltaic Panel Examples

The panels would be fastened to the roof with non-penetrating clamps. The panels would be grouped in approximately 50 foot by 50 foot arrays, with 4 to 6 foot access walkways between adjacent arrays. Five crews consisting of about 5 personnel each would work simultaneously on separate sections of the aluminum roof installing panels and completing the wiring. This task would take approximately 6 months to complete and would entail an average of less than 3 truck deliveries per day for the solar panels and about 2 additional deliveries per week for other components required for the task. An on-site truck crane would be required to offload the panels.

Because the solar panel system creates direct current (DC) power, inverters are required to change the power to alternating current (AC) power usable in the City distribution system. Five 12,000-pound pad-mounted inverters (one per MW of power generation) would be required near Upper Stone Reservoir.

One 10,500-pound pad-mounted transformer to step up the voltage of the power generated by the solar panels before distribution would also be required. This equipment would be located within the SCRC. Each inverter and the transformer would be delivered by a single truck. Each would require a concrete pad with a compacted aggregate base (approximately 15 feet square for the inverters and 8 feet square for the transformer). This would entail a total of approximately 5 truck deliveries for the aggregate, reinforcing steel, and concrete. A backhoe would also be required to excavate the area for the pads, and a small crane would be required to offload and position the transformer and inverters on the pads. This task would generally involve fewer than 8 personnel and would take approximately 2 months to complete. However, the work would be entirely concurrent with the installation of the solar panels.

The interconnection of the solar power facility would involve running new feeder lines along existing distribution pathways to an existing LADWP distribution station. This task would involve minor off-site work, including stringing conductors, and would occur concurrently with the installation of the solar panels. Once all of this work is completed, the final test, inspection, and commissioning of the system would take approximately 1 month.

Because some of the tasks involved in the power interconnection would occur concurrently with the solar panel installation on the aluminum cover, the peak on-site personnel would reach approximately 35 (during the installation of the inverters and transformer). Truck deliveries required for the solar installation would average about 3 per day, but a slightly higher number of daily truck trips may occur when both solar panel components and foundation material for the inverters and transformer are delivered on the same day. Little equipment would be operating on site during this phase other than a truck crane and, for brief periods during the transformer and inverter installation, a backhoe, soil compactor, and concrete truck.

Solar Power Facility Operations

No additional personnel would be required at the SCRC on a daily basis to maintain and operate the Upper Stone Reservoir solar power facilities. A small number of personnel may be required during brief periods when certain maintenance operations must be performed. The project would be monitored by automated methods to ensure that it is generating electricity to the specified capacity. Static PV arrays generate electricity without moving parts, and general maintenance requirements are characteristically low. Maintenance activities, such as troubleshooting, repairing, replacing, or optimizing system components, would occur on an event-driven basis. Occasional washing of the solar panels may be required in order to restore generation efficiency. However, such washing would be performed only as needed to maintain system performance and manufacturer's warranties on electrical equipment.

Aesthetics

As discussed in Chapter 3.1, publicly available views of Upper Stone Reservoir from the surrounding area are limited to a single public overlook maintained by the Santa Monica Mountains Conservancy, located approximately 0.75 miles east of the SCRC entry on Mulholland Drive. Portions of Upper Stone Reservoir are visible in the middle ground of the view from the overlook, and a relatively small portion of Lower Stone Reservoir is visible in the background. Given the expansiveness of the view of the canyon, the reservoirs are not dominant visual elements from the overlook.

Private views of Upper Stone Reservoir are primarily from residential properties located to the west, although some views from the north, northeast, and southwest are also available. No individual private property surrounding the SCRC has an unobstructed view of the entire Upper Stone Reservoir due to intervening terrain, vegetation, and structures. Portions of Upper Stone Reservoir are visible in the middle ground of the view from these properties. Upper Stone Reservoir itself, within the context of the canyon, does not represent a dominant visual element.

In contrast to Lower Stone Reservoir, Upper Stone Reservoir is an entirely manmade feature in both structure and appearance. The approximately 14-acre Upper Stone Reservoir is tear drop shaped and has continuous, straight edges. An outlet tower approximately 15 feet in diameter projects above the water surface approximately 30 feet near the southwest corner of Upper Stone Reservoir. The tower is connected to the Upper Stone Reservoir perimeter road by an approximately 140-foot long footbridge. The water level in Upper Stone Reservoir can fluctuate considerably depending on water demand and other factors, exposing or concealing more of the asphalt side walls. Upper Stone Reservoir is surrounded by an approximately 3-foot tall concrete parapet wall. An approximately 8-foot tall chain link fence sits atop the parapet wall. The perimeter of Upper Stone Reservoir is surrounded by an approximately 15- to 20-foot wide paved maintenance road. This manmade appearance is evident from both the public and private viewpoints of Upper Stone Reservoir.

Implementation of the aluminum cover alternative would alter the view from the public and private viewpoints of Upper Stone Reservoir by replacing the open water surface with a manmade cover (see Figures 5-8 through 5-11). Although the open water surface would no longer be visible, Upper Stone Reservoir with the aluminum cover would be visually similar in character to the existing manmade context. Given the general context of the setting in Stone Canyon, the limited views of the existing Upper Stone Reservoir, and the manmade character of the existing upper reservoir, the aluminum cover alternative would not represent a substantial change to the visual environment, and therefore, would not have a substantial adverse effect on a scenic vista or substantially degrade the existing visual character or quality of the site and its surroundings. The impact to aesthetics from the aluminum cover would be less than significant.

Solar Panel Option

The implementation of the solar panel option for the aluminum cover alternative would not alter this conclusion regarding a less than significant impact to scenic vistas or the visual character or quality of the site or surroundings because the panels would have a low profile above the aluminum cover and, as with the cover itself, would be similar in character to the existing manmade Upper Stone Reservoir (see Figures 5-12 through 5-15).

To keep the PV cells clean and protect them from damage but still allow for the collection of solar energy, the surface of the solar panels would be covered with a pane of glass, which is normally a reflective material. However, the solar panels would employ a low-iron content glass that is specifically designed to provide high transparency to increase light transmission to the PV cells and reduce the reflection of light. In addition, the glass panes would include an anti-reflective coating or finish to further increase the transmission of light through the glass to the cells and decrease reflection. While these characteristics of the solar panel glass, intended to increase energy production, do not entirely eliminate reflection, the general appearance of the panels would be a dark field, which would not adversely affect views from the overlook on Mulholland Drive. Glare, which would be caused by the direct reflection of the sun in the panels, would also be reduced by the anti-reflective characteristics of the glass and would generally be no greater than that experienced off the surface of the existing uncovered Upper Stone Reservoir and would be momentary from any given viewpoint.

Figure 5-8 Existing view from Mulholland Drive public overlook

Figure 5-9 Proposed view with aluminum cover from Mulholland Drive public overlook

Figure 5-10 Existing private view from south-southwest of Upper Stone Reservoir

Figure 5-11 Proposed private view with aluminum cover from south-southwest of Upper Stone Reservoir

Figure 5-12 Existing view from Mulholland Drive public overlook

Figure 5-13 Proposed view with aluminum cover with solar from Mulholland Drive public overlook

Figure 5-14 Existing private view from south-southwest of Upper Stone Reservoir

Figure 5-15 Proposed private view with aluminum cover with solar from south-southwest of Upper Stone Reservoir

Air Quality/Greenhouse Gas Emissions

Regional Construction Emissions

The aluminum cover alternative would require significantly less construction activity than the proposed project, and the construction schedule would be approximately 0.5 years shorter. It is anticipated that construction activities would start in 2014 and be completed in 2018. The worst case emissions would occur during Phase 1 of construction. As with the proposed project, daily NO_X, PM_{10}, and $PM_{2.5}$ emissions would exceed the SCAQMD regional significance thresholds. Implementation of mitigation measures AIR-A through AIR-E would be required (see Section 3.2.5 of the EIR), except, because of the earlier construction start date for the aluminum cover compared to the proposed project (2014 versus 2015), mitigation measure AIR-C would be modified as follows:

- *January 1, 2014, to December 31, 2014*: All off-road diesel-powered construction equipment greater than 50 horsepower shall meet EPA Tier 3 off-road emissions standards. In addition, all construction equipment shall be outfitted with the best available control technology devices certified by CARB. Any emissions control device used by the contractor shall achieve emissions reductions that are no less than what could be achieved by a CARB-defined Level 3 diesel emissions control strategy for a similarly sized engine.
- *Post-January 1, 2015*: All off-road construction diesel engines not registered under CARB's Statewide Portable Equipment Registration Program and that have a rating of 50 horsepower (hp) or more shall meet, at a minimum, the Tier 4 California Emission Standards for Off-Road Compression-Ignition Engines as specified in California Code of Regulations, Title 13, Section 2423(b)(1) unless such engine is not available for a particular item of equipment. In the event a Tier 4 engine is not available for any off-road equipment larger than 100 hp, that equipment shall be equipped with a Tier 3 engine. Equipment properly registered under and in compliance with CARB's Statewide Portable Equipment Registration Program shall be considered in compliance with this mitigation measure.

A 5 percent reduction in construction equipment exhaust was used to estimate emissions reductions due to the implementation of mitigation measures AIR-A through AIR-E. As demonstrated in Table 5-12, construction emissions of NO_X, PM_{10}, and $PM_{2.5}$ would remain over the SCAQMD daily regional significance thresholds. Therefore, the aluminum cover alternative would result in a significant and unavoidable impact related to regional construction emissions. The impact would be similar to the proposed project. However, although peak daily emissions are similar for the aluminum cover alternative and the proposed project, the aluminum cover alternative would create substantially lower total emissions during the construction period due to the nature and length of the construction activities.

Table 5-12 Aluminum Cover Estimated Peak Regional Daily Construction Emissions – Mitigated

Construction Phase	Pounds Per Day					
	VOC	**NO_X**	**CO**	**SO_X**	**$PM_{2.5}$[1]**	**PM_{10}[1]**
Phase 1	46	376	191	1	65	252
Phase 2	42	319	185	1	63	229
Phase 3	15	110	59	<1	5	227
Phase 4	4	32	18	<1	2	7
Phase 5	2	7	14	<1	1	3
Maximum Regional Total	46	376	191	1	65	252
Significance Threshold	*75*	*100*	*550*	*150*	*55*	*150*
Exceed Threshold?	No	Yes	No	No	Yes	Yes

[1] Emissions for fugitive dust were adjusted to account for a 61 percent control efficiency associated with SCAQMD Rule 403.
Source: Terry A. Hayes Associates 2011.

Localized Construction Emissions

The dispersion modeling results indicate that maximum localized emissions of $PM_{2.5}$, PM_{10}, NO_2, and CO would be the similar for the aluminum cover alternative as for the proposed project. This is because concentrations are directly related to the distance between the source and the sensitive receptor. As with the proposed project, the peak localized $PM_{2.5}$ and PM_{10} concentrations would exceed the significance thresholds at residential land uses near Upper Stone Reservoir. Therefore, the aluminum cover alternative would result in a significant impact related to localized construction emissions, even with implementation of mitigation measures AIR-A through AIR-E, as shown in Table 5-13. Therefore, similar to the proposed project, the localized construction emissions impact would remain significant and unavoidable under the aluminum cover alternative. However, over the entire construction period, substantially fewer emissions would be produced under the aluminum cover alternative than under the proposed project.

Table 5-13 Aluminum Cover Estimated Peak Localized Construction Emissions – Mitigated

Pollutant	Estimated Emissions (lbs/day)	Concentration at nearest sensitive receptor	Significance Threshold	Significant Impact?
$PM_{2.5}$	63	47 ug/m^3	10.4 ug/m^3	Yes
PM_{10}	246	212 ug/m^3	10.4 ug/m^3	Yes
NO_2	27	0.04 ppm	0.18 ppm	No
CO (1-Hour)	141	0.3 ppm	20 ppm	No
CO (8-Hour)	141	0.1 ppm	9 ppm	No

Source: Terry A. Hayes Associates 2011.

Toxic Air Contaminants

Similar to the proposed project, a health risk assessment was completed for the aluminum cover alternative to determine the risk posed to sensitive receptors from construction activity, particularly diesel emissions. The results of the HRA indicated that construction of the aluminum cover alternative would not exceed the estimated carcinogenic risk of 10 persons in one million threshold at the following sensitive receptor locations: American Jewish University, Roscomare Road Elementary School, and Stephen S. Wise Elementary School. However, the estimated carcinogenic risk over a 70-year lifetime would exceed the 10 persons in one million threshold at the closest residential land uses to the reservoir. The carcinogenic risk would be 15 persons in one million at these residences during construction. Therefore, construction of the aluminum cover alternative, like the proposed project, would result in a significant and unavoidable impact related to TACs. Even with the implementation of mitigation measures AIR-C through AIR-E, this impact would remain significant and unavoidable.

Operational Phase

Operation of the aluminum cover alternative would not generate any additional daily vehicle trips or create a significant increase in maintenance activities compared to existing conditions because, unlike under the proposed project, no public access would be permitted at the SCRC. Thus, implementation of the aluminum cover alternative would not create any additional emissions during the operational phase. There would be no operational air quality impact, and the impact would be less than the proposed project.

Greenhouse Gas Emissions

GHG emissions were calculated for construction activity associated with the aluminum cover alternative. Based on SCAQMD guidance, the emissions summary includes construction emissions averaged over a 30-year span. The aluminum cover alternative would have no net increases in vehicle traffic during operations, and therefore, only construction emissions are quantified. (The aluminum cover alternative with implementation of the solar panel option would have a beneficial long-term impact of reducing GHG emissions related to electricity generation. However, since the solar panel installation is optional, this analysis did not account for the reduction associated with the panels.) As shown in Table 5-14, the aluminum cover alternative would result in 372 metric tons of CO_2e per year. GHG emissions would not exceed the 10,000 metric tons of CO_2e per year significance threshold and would result in a less than significant impact. The impact would be the same as the proposed project (less than significant), although substantially lower GHG emissions would be produced under the aluminum cover alternative than under the proposed project.

Table 5-14 Aluminum Cover Estimated Annual Greenhouse Gas Emissions

Source	Carbon Dioxide Equivalent (Metric Tons per Year)
Construction Phase 1	2,277
Construction Phase 2	3,681
Construction Phase 3	4,846
Construction Phase 4	121
Construction Phase 5	226
Total Construction Emissions	11,151
Total Construction Emissions Amortized[1]	372
Significance Threshold	*10,000*
Exceed Threshold?	No

[1] Based on SCAQMD guidance, the emissions summary also includes construction emissions amortized over a 30-year span.
Source: Terry A. Hayes Associates 2011.

Construction activity for the aluminum cover alternative would incorporate source reduction techniques and recycling measures to divert waste from landfills. As with the proposed project, the aluminum cover alternative would not conflict with any state or local climate change policy or regulation.

Solar Panel Option

The implementation of the solar panel option would extend the length of construction of the aluminum cover alternative by approximately 7 months. However, because the installation of the panels would involve low levels of equipment use, truck deliveries, and personnel, emissions of criteria pollutants and GHGs would remain well below significance thresholds established by local, state, and federal agencies. The solar panel option would not in itself or cumulatively, when considered along with other phases of construction associated with the aluminum cover, create additional significant impacts related to air quality. The generation of energy by the solar panels would decrease regional air pollutant and GHG emissions over the long run by displacing an equivalent amount of fossil-fuel generated energy.

Biological Resources

The aluminum cover alternative would utilize a similar construction disturbance area as the proposed project because this alternative involves landslide stabilization. However, substantially less material would require temporary stockpiling under the aluminum cover alternative than under the proposed project (4,700 CY versus 151,000 CY). Similar to the proposed project, construction activities have the potential to adversely impact sensitive plant species, sensitive habitats, protected trees, sensitive wildlife species, and indirectly impact migratory birds depending on the timing of construction. With implementation of mitigation measures BIO-A through BIO-G (see Section 3.3.4), impacts to sensitive species, nesting migratory birds, and protected trees would be reduced to a less than significant level during construction. Because no public access would be permitted under the aluminum cover alternative, long-term impacts to sensitive wildlife and plant species would not occur, and the operational impact would not occur.

Solar Panel Option

The implementation of the solar panel option would extend the length of construction of the aluminum cover alternative by approximately 7 months, but the area of disturbance would not increase. With the implementation of the construction mitigation measures as outlined above, the solar panel option would not in itself or cumulatively, when considered along with other phases of construction associated with the aluminum cover, create additional significant impacts to biological resources.

Cultural Resources

As discussed in Chapter 3.4, Upper Stone Reservoir was evaluated for its eligibility for the California Register or the National Register. It was determined that Upper Stone Reservoir is not eligible for listing as a historic resource. Thus, further modification of the reservoir to construct the aluminum cover alternative would have a less than significant impact on historic resources.

Ground disturbing activities would include demolishing and replacing the existing asphalt liner in Upper Stone Reservoir and stabilizing the slopes on the east side of the upper reservoir. A similar amount of ground disturbing activities would occur under the aluminum cover alternative as under the proposed project. As with the proposed project, construction activities would have the potential to disturb previously unearthed archaeological resources. The aluminum cover alternative would require the implementation of mitigation measure CR-A (see Section 3.4.4). As with the proposed project, the impact to archaeological resources would be reduced to a less than significant level. The impacts to paleontological resources would be less than significant, similar to the proposed project.

Solar Panel Option

The implementation of the solar panel option of the aluminum cover would not alter this conclusion. The implementation of the solar panel option would entail primarily above-ground construction activities on the aluminum cover that would not create additional impacts to archaeological resources. Minor ground disturbing activities would occur related to the construction of the concrete pad for the inverters and transformer. However, with the implementation of the mitigation measures CR-A, any impacts would be reduced to a less than significant level.

Wildland Fire

Unlike the proposed project, which would provide passive recreation in the form of limited trails access within portions of the SCRC, public access to the complex property would not permitted as part of the aluminum cover alternative. Operations at the SCRC would be similar to existing conditions. As such, there would not be an increased risk of loss from wildland fire. Implementation of the solar panel option of the aluminum cover would not alter this conclusion.

Land Use

Unlike the proposed project, which would provide a vegetated area in place of Upper Stone Reservoir, the aluminum cover alternative would be inconsistent with the existing OS zoning designation of the reservoir property. Open reservoirs are an allowable use within the OS zone.

Appurtenant facilities that are incidental to the operation and continued maintenance of such reservoirs are also permitted within the OS zone under the provisions of a Conditional Use Permit. However, an aluminum cover is not considered an appurtenant use, but a replacement of an open reservoir with a covered storage facility. The implementation of the aluminum cover alternative would require a zoning variance for the SCRC property. With a zoning variance, the impact to land use from the aluminum cover alternative would be less than significant.

Noise

On-site Construction Noise

Similar to the proposed project, some construction activity would occur inside the drained upper reservoir, which would attenuate construction noise due to the “line-of-sight” factor of the noise source. However, for the purposes of providing a conservative analysis, a reduction for below ground construction was not taken into account in the determination of impact. Construction activity associated with the aluminum cover alternative would generally be less intense than the activity associated with the proposed project. However, the aluminum cover alternative and the proposed project would use similar types and numbers of equipment during certain phases of construction. Therefore, maximum construction noise would be the same. Construction noise levels related to the aluminum cover construction would not exceed the 5-dBA significance threshold at nearby sensitive receptors. The impact would be less than significant.

Similar to the proposed project, haul truck noise on the interior site access road would increase ambient noise levels in the surrounding areas above the City’s thresholds. Because the background existing noise levels within the SCRC are so low since the majority of the property is undeveloped, haul truck noise along the interior site access road would be more audible to nearby sensitive receptors than haul truck trips that would occur on the heavily trafficked Mulholland Drive. Therefore, on-site truck noise would result in a significant impact, and the implementation of mitigation measures NOISE-A and NOISE-B (see Section 3.6.5) would be required. Even with implementation of mitigation measures, the noise levels would remain above the City’s standards and the on-site haul truck noise impact would be significant and unavoidable. However, the duration of construction would be shorter and the total number of truck trips would be substantially fewer under the aluminum cover alternative than under the proposed project.

Off-site Construction Noise

Under the aluminum cover alternative, haul trucks would use the same route as the proposed project. The nearest sensitive land uses to the construction haul route would be the residences located on Mulholland Drive, American Jewish University, and Stephen S. Wise Elementary School. Existing and aluminum cover noise levels were calculated based on the FHWA RD-77-108 noise calculation formulas. Table 5-15 shows the estimated noise levels at sensitive receptors located along the haul route.

Table 5-15 Aluminum Cover Off-site Construction Haul Route Noise Levels

Sensitive Receptor	Existing Ambient (dBA, CNEL)	New Ambient (dBA, CNEL)	Increase
Residences along Mulholland Drive	70.0	72.5	2.5
American Jewish University	69.8	72.4	2.6
Stephen S. Wise Elementary School	69.8	72.4	2.6

Note: Truck noise levels were adjusted by 2 dB to account for the roadway gradient.
Source: Terry A. Hayes Associates 2011.

As shown in Table 5-15 above, modeled existing noise levels were estimated to be approximately 69.8 dBA at each segment analyzed. Future ambient noise levels would be about 72.4 dBA. Similar to the proposed project, haul route truck noise under the aluminum cover alternative would not exceed the 5-dBA significance threshold. The off-site haul truck noise impact would be less than significant. Further, the duration of haul truck trips and total number of truck trips would be substantially lower for the aluminum cover alternative compared to the proposed project.

Operational Noise

Unlike the proposed project, the aluminum cover alternative would not include passive recreation within portions of the SCRC. Therefore, there would be no increase in vehicle trips to and from the site. Thus, there would be no incremental increase in noise levels associated with operation of the aluminum cover alternative.

Groundborne Vibration

The use of heavy equipment (e.g., a large bulldozer) would generate vibration levels of 0.089 inches per second at a distance of 25 feet. In addition, the aluminum cover alternative would increase truck traffic along the haul route. As with the proposed project, vibration levels at the nearest sensitive receptors would not exceed the potential building damage threshold of 0.3 inches per second. Therefore, the aluminum cover alternative, like the proposed project, would result in a less than significant impact related to construction vibration.

The operation of the aluminum cover alternative would not include significant stationary sources of groundborne vibration, such as heavy equipment operations. Operational groundborne vibration in the project vicinity would be generated by vehicular travel on the local roadways. However, similar to existing conditions, project-related traffic vibration levels would not be perceptible by sensitive receptors. Therefore, the aluminum cover alternative, like the proposed project, would result in a less than significant impact related to operational vibration.

Solar Panel Option

The implementation of the solar panel option would extend the length of construction of the aluminum cover alternative by approximately 7 months. However, because the installation of the panels would involve low levels of equipment use, truck deliveries, and personnel, no significant noise would be generated during construction. The construction of the solar panel option would not in itself or cumulatively, when considered along with other phases of construction associated with the aluminum cover, create additional significant impacts related to noise. The operation of the solar panels would generate no noise.

Transportation and Traffic

Study Intersection Construction Analysis

The aluminum cover alternative would be constructed in four phases, with an optional fifth phase (for solar panel installation), over approximately 3.5 years. Trip generation for employees and trucks would vary depending on the phase of construction. Table 5-16 provides the peak hour trip generation calculations for the aluminum cover construction scenario, based on the number of on-site employees and the number of daily truck trips during the peak of activity, which would occur in Phase 1 of construction.

Table 5-16 Daily Construction One-Way Trip Generation Calculations for Aluminum Cover Alternative

Generator	Daily	Weekday AM Total	Weekday AM In	Weekday AM Out	Weekday PM Total	Weekday PM In	Weekday PM Out
Employees[1]	96	48	48	0	48	0	48
Trucks[2]	395	50	25	25	50	25	25
Total	*491*	*98*	*73*	*25*	*98*	*25*	*73*

[1] Employee trips = 1 person/vehicle
[2] Vehicle trips = 2.5 passenger car equivalent x truck trips
Source: KOA Corporation 2011.

The number of employee trips was based on the assumption that all 48 employees would arrive within the morning peak hour and depart within the evening peak hour. The number of truck trips was based on a typical 8-hour shift, with delivery truck trips distributed throughout the day. Based on a daily total of 395 truck trips (158 trucks at the 2.5 passenger car equivalent factor), about 50 truck trips (20 trucks at the 2.5 passenger car equivalent factor) would occur during both the morning and evening peak hours. The total construction trip generation with passenger car equivalent factor would be 491 daily trips, of which 98 trips would occur during each of the peak hours.

Vehicle trips generated by the aluminum cover alternative were added to background traffic volumes that would occur without implementation of a project. Tables 5-17 and 5-18 provide a summary of the construction period study intersection impact analysis for the aluminum cover alternative during the morning and evening peak periods. The LOS calculation worksheets for this analysis are provided in Appendix G.

Table 5-17 Aluminum Cover Study Intersection LOS – AM Peak Hour

#	Intersection	2010		Future Without Project (2014)		Future With Project (2014)		Diff.	Sig. Impact?
		V/C	LOS	V/C	LOS	V/C	LOS		
1	Roscomare Road/Mulholland Drive	0.677	B	0.720	C	0.772	C	0.052	YES
2	Casiano Road/Mulholland Drive	0.620	B	0.661	B	0.712	C	0.051	YES
3	Skirball Center Drive/Mulholland Drive	0.888	D	0.938	E	0.955	E	0.017	NO
4	Skirball Center Drive/I-405 Northbound Ramps	0.799	C	0.838	D	0.857	D	0.019	NO
5	Skirball Center Drive /I-405 Southbound Ramps	0.621	B	0.659	B	0.694	B	0.035	NO

Note: All study intersections are equipped with ATSAC and ATCS capability. Per LADOT policies, a 0.100 V/C reduction has been applied to all calculations.
Source: KOA Corporation 2011.

Table 5-18 Aluminum Cover Study Intersection LOS – PM Peak Hour

#	Intersection	2010		Future Without Project (2014)		Future With Project (2014)		Diff.	Sig. Impact?
		V/C	LOS	V/C	LOS	V/C	LOS		
1	Roscomare Road/Mulholland Drive	0.506	A	0.552	A	0.603	B	0.051	NO
2	Casiano Road/Mulholland Drive	0.394	A	0.433	A	0.450	A	0.017	NO
3	Skirball Center Drive/Mulholland Drive	0.640	B	0.691	B	0.742	C	0.051	YES
4	Skirball Center Drive/I-405 Northbound Ramps	0.545	A	0.578	A	0.605	B	0.027	NO
5	Skirball Center Drive /I-405 Southbound Ramps	0.503	A	0.543	A	0.577	A	0.034	NO

Note: All study intersections are equipped with ATSAC and ATCS capability. Per LADOT policies, a 0.100 V/C reduction has been applied to all calculations.
Source: KOA Corporation 2011.

As shown in Tables 5-17 and 5-18, above, the peak construction of the aluminum cover alternative would create significant impacts at two study intersections during the morning peak hour and one study intersection during the evening peak hour. With implementation of mitigation measures TRANS-A and TRANS-B (see Section 3.7.3), the impact during the evening peak hour impact would be eliminated. However, significant and unavoidable impacts would still remain at the two study intersections during the morning peak hour: Roscomare Road at Mulholland Drive and Casiano Road at Mulholland Drive. As with the proposed project, construction of the aluminum cover alternative would result in significant and unavoidable impacts to the study intersections; however, substantially fewer total trips would be generated under the aluminum cover alternative throughout the course of construction than under the proposed project.

Study Roadway Segment Construction Analysis

In addition, peak hour traffic impacts were analyzed at the study roadway segments to determine potentially significant impacts. Table 5-19 summarizes the peak-hour volumes that would occur throughout the day. The LOS calculation worksheets for this analysis are provided in Appendix G.

Table 5-19 Aluminum Cover Peak Hour Weekday Roadway Segment Volumes 2014

Study Roadway Segment	Base Volumes								Proposed Project				
	2010			Ambient Growth	Area Projects	Future Base			Construction Only	Future With Construction			
	Volume	V/C	LOS			Volume	V/C	LOS		Volume	V/C	LOS	% Share
Mulholland Drive between Nicada Drive & Stone Canyon Road	1,338	1.070	F	4%	58	1,450	1.160	F	0	1,450	1.160	F	0.0
Mulholland Drive between Woodcliff Road & Antelo Place	1,225	0.980	E	4%	58	1,332	1.066	F	98	1,430	1.144	F	3.7
Mulholland Drive between Roscomare Road & Casiano Road	1,564	0.834	D	4%	58	1,685	0.899	D	98	1,783	0.951	E	3.0
Skirball Center Drive between Mulholland Drive & I-405 NB Ramps	1,999	0.799	C	4%	58	2,138	0.855	D	98	2,236	0.894	D	2.3
Skirball Center Drive between Skirball Center Drive & I-405 SB Ramps	1,386	0.554	A	4%	37	1,479	0.592	A	49	1,528	0.611	B	1.6

Source: KOA Corporation 2011.

Based on the results shown in Table 5-19, construction of the aluminum cover alternative would create significant impacts on Mulholland Drive, between Woodcliff Road and Antelo Place, and Mulholland Drive, between Roscomare Road and Casiano Road. The decrease in service at intersections designated as E or F would result in a significant impact, and implementation of mitigation measures TRANS-A and TRANS-B is required. However, the aluminum cover alternative would create substantially fewer average and peak construction-related daily vehicle trips compared to the proposed project.

Truck traffic during the peak and throughout the course of construction of the aluminum cover would be substantially less than under the proposed project. However, similar to the proposed project, construction traffic exiting the SCRC onto Mulholland Drive would nonetheless pose a potential safety hazard to motorists on Mulholland Drive. Implementation of mitigation measures TRANS-B and TRANS-D would be required to reduce the impact to a less than significant level.

2008 Baseline With Aluminum Cover

Using the same trip generation and trip distribution assumptions described above, the study intersection operations for the 2008 baseline with the aluminum cover alternative are summarized in Table 5-20 for the morning peak hour and Table 5-21 for the evening peak-hour. The LOS calculation worksheets for this analysis are provided in Appendix G.

Table 5-20 2008 Baseline With Aluminum Cover Study Intersection LOS – AM Peak Hour

#	Intersection	2008		2008 Baseline With Project		Diff.	Sig. Impact?
		V/C	LOS	V/C	LOS		
1	Roscomare Road/Mulholland Drive	0.688	B	0.739	C	0.051	YES
2	Casiano Road/Mulholland Drive	0.631	B	0.682	B	0.051	NO
3	Skirball Center Drive/Mulholland Drive	0.903	E	0.921	E	0.018	YES
4	Skirball Center Drive/I-405 Northbound Ramps	0.813	D	0.832	D	0.019	NO
5	Skirball Center Drive /I-405 Southbound Ramps	0.632	B	0.666	B	0.034	NO

Note: All study intersections are equipped with ATSAC and ATCS capability. Per LADOT policies, a 0.100 V/C reduction has been applied to all calculations.
Source: KOA Corporation 2011.

Table 5-21 2008 Baseline With Aluminum Cover Study Intersection LOS – PM Peak Hour

#	Intersection	2008		2008 Baseline With Project		Diff.	Sig. Impact?
		V/C	LOS	V/C	LOS		
1	Roscomare Road/Mulholland Drive	0.515	A	0.566	A	0.051	NO
2	Casiano Road/Mulholland Drive	0.402	A	0.419	A	0.017	NO
3	Skirball Center Drive/Mulholland Drive	0.651	B	0.702	C	0.051	YES
4	Skirball Center Drive/I-405 Northbound Ramps	0.555	A	0.582	A	0.027	NO
5	Skirball Center Drive /I-405 Southbound Ramps	0.512	A	0.546	A	0.034	NO

Note: All study intersections are equipped with ATSAC and ATCS capability. Per LADOT policies, a 0.100 V/C reduction has been applied to all calculations.
Source: KOA Corporation 2011.

As shown in Tables 5-20 and 5-21 above, the baseline comparison for the aluminum cover alternative would create significant impacts at two study intersections during the morning peak hour and one study intersection during the evening peak hour. With implementation of mitigation measures TRANS-A and TRANS-B (see Section 3.7.3), the impact during the evening peak hour impact would be eliminated. However, significant and unavoidable impacts would still remain at one study intersection during the morning peak hour: Roscomare Road at Mulholland Drive. As with the proposed project, construction of the aluminum cover alternative would result in significant and unavoidable impacts to the study intersections; however, substantially fewer total trips would be generated under the aluminum cover alternative throughout the course of construction than under the proposed project.

In addition, peak hour traffic impacts were analyzed at the study roadway segments to determine potentially significant impacts compared to baseline conditions. Table 5-22 summarizes the peak-hour volumes that would occur throughout the day. The LOS calculation worksheets for this analysis are provided in Appendix G.

Table 5-22 Aluminum Cover 2008 Baseline Peak Hour Weekday Roadway Segment Volumes

Study Roadway Segment	2008			Construction Only	2008 Baseline With Construction			
	Volume	V/C	LOS		Volume	V/C	LOS	% Share
Mulholland Drive between Nicada Drive & Stone Canyon Road	1,358	1.086	F	0	1,358	1.086	F	0.0
Mulholland Drive between Woodcliff Road & Antelo Place	1,243	0.994	E	98	1,341	1.073	F	4.0
Mulholland Drive between Roscomare Road & Casiano Road	1,588	0.847	D	98	1,686	0.899	D	3.2
Skirball Center Drive between Mulholland Drive & I-405 NB Ramps	2,029	0.812	D	98	2,127	0.851	D	2.4
Skirball Center Drive between I-405 SB and NB Ramps	1,407	0.563	A	49	1,456	0.582	A	1.7

Source: KOA Corporation 2011.

Based on the results shown in Table 5-22, construction of the aluminum cover alternative would create significant impacts at Mulholland Drive between Woodcliff Road and Antelo Place. The decrease in service at intersections designated as E or F would result in a significant impact, and implementation of mitigation measures TRANS-A and TRANS-B (see Section 3.7.3) is required. However, the aluminum cover alternative would create substantially fewer average and peak construction-related daily vehicle trips compared to the proposed project.

CMP Construction Analysis

The peak phase of construction activity (Phase 1) for the aluminum cover alternative would add fewer than 50 trips to the I-405 on- and off-ramps at Skirball Center Drive. Unlike the proposed project, the impact to these CMP facilities would be less than significant, and no mitigation is required. As with the proposed project, the aluminum cover alternative would not add more than 150 new trips per hour to any freeway segments near the project site. Like the proposed project, the impact would be less than significant.

Operations Phase

Unlike under the proposed project, no public access for recreation would be provided at the SCRC as part of the aluminum cover alternative. Operation of the aluminum cover alternative would be similar to the existing uncovered Upper Stone Reservoir. There would be no increase in vehicle trips to and from the SCRC along Mulholland Drive. No impact would occur to transportation and traffic during operation of the aluminum cover alternative.

Solar Panel Option

The implementation of the solar panel option would extend the length of construction of the aluminum cover alternative by approximately 7 months. However, because the installation of the panels would involve low levels of truck deliveries and personnel, no significant traffic would be generated during construction. The construction of the solar panel option would not in itself or cumulatively, when considered along with other phases of construction associated with the aluminum cover, create additional significant impacts related to transportation or traffic. The operation of the solar panels would generate only minimal traffic related to periodic maintenance activities.

Summary of Conclusions

Under the aluminum cover alternative, Upper Stone Reservoir, although relined, would be retained in essentially its same configuration, and LADWP would install a lightweight aluminum cover over the entire surface of the reservoir. Under this alternative, the SCRC would remain under the control of LADWP, and no public access to the site would be provided. Construction of the aluminum cover alternative would take approximately 3.5 years to complete. As with the proposed project, the aluminum cover alternative would meet the primary project objectives. The aluminum cover alternative would comply with updated water quality regulations, and it would maintain local drinking water storage capacity within the SCRC service area. However, this alternative would not meet the secondary project objective of helping to restore the natural character of those portions of Stone Canyon involved in the project improvements.

The following summarizes the potential environmental impacts that would be created by the aluminum cover alternative compared to those that would be created by the proposed project.

Aesthetics

- Neither the aluminum cover alternative nor the proposed project would create a significant impact to a scenic vista.
- Neither the aluminum cover alternative nor the proposed project would create a significant impact by substantially degrading the existing visual character or quality of the site and its surroundings.

Air Quality

- The aluminum cover alternative, like the proposed project, would create significant and unavoidable regional air quality impacts during certain periods of the construction phase. However, while the aluminum cover alternative would result in similar peak emissions, it would result in substantially lower emissions over the entire construction period compared to the proposed project.
- The proposed project would create a less than significant regional air quality impact related to post-construction operations. Because the aluminum cover alternative would generate no additional post-construction traffic or maintenance activity at the SCRC from passive recreation use, it would create no impacts related to regional air pollutant emissions during post-construction operations.
- The aluminum cover alternative, like the proposed project, would create a significant and unavoidable impact related to localized air pollutant emissions and TACs. However, the aluminum cover alternative would result in similar localized air pollutant concentrations but higher TAC emissions during construction compared to the proposed project.
- The proposed project would create a less than significant impact related to localized air pollutant emissions and TACs during post-construction project operations. Because the aluminum cover alternative would generate no additional post-construction traffic or maintenance activity at the SCRC from passive recreation use, it would create no impacts related to localized air pollutant emissions or TACs during post-construction operations.
- Neither the proposed project nor the aluminum cover alternative would create a significant impact related to GHG emissions from either construction or operations. However, the aluminum cover alternative would create lower GHG emissions during construction and operations when compared to the proposed project.

Biological Resources

- Both the aluminum cover alternative and the proposed project could create significant impacts related to sensitive plant and wildlife species, sensitive habitats, and migratory birds, as well as conflict with the local tree protection ordinance. With the implementation of mitigation measures BIO-A through BIO-G, these impacts would be reduced to a less than significant level under both the aluminum cover alternative and the proposed project. However, potential impacts to biological resources would be decreased under the aluminum cover alternative when compared to the proposed project because the nature and duration of construction activities.

- Unlike the proposed project, because no recreation activity at the SCRC would be provided, no long-term impacts to sensitive plant and wildlife species would occur during operation of the aluminum cover alternative.

Cultural Resources

- Both the aluminum cover alternative and the proposed project would create significant impacts related to ground disturbing activities that have the potential to uncover previously unearthed archaeological resources. With the implementation of mitigation measure CR-A, the impact would be reduced to a less than significant level.
- Both the proposed project and aluminum cover alternative would have less than significant impacts to historic resources and paleontological resources.

Wildland Fire

- Unlike the proposed project, the aluminum cover alternative would not include public access within portions of the SCRC during the post-construction operations. As such, there would be no increased risk of loss from wildland fire.

Land Use

- Unlike the proposed project, the aluminum cover alternative would require a zoning variance for the SCRC.

Noise

- Both the aluminum cover alternative and the proposed project would create a less than significant impact related to on-site construction equipment noise. However, both the proposed project and the aluminum cover alternative would create a significant noise impact associated with on-site haul truck trips. Even with implementation of mitigation measures NOISE-A and NOISE-B, the impact would remain significant and unavoidable. However, over the entire period of construction, the aluminum cover alternative would create less noise than the proposed project because of the nature and duration of the construction activities.
- Both the proposed project and the aluminum cover alternative would have a less than significant mobile noise impact associated with haul truck trips to and from the SCRC. However, the impact under the aluminum cover alternative would be less than under the proposed project because the duration of construction would be somewhat shorter and there would be substantially fewer construction haul truck trips overall.
- The proposed project would create a less than significant impact related to noise during post-construction project operations. Because the aluminum cover alternative would generate no additional post-construction traffic or maintenance activity at the SCRC from passive recreation use, it would create no impact related to noise during post-construction operations.

Transportation and Traffic

- Both the proposed project and the aluminum cover alternative would create significant impacts related to level of service at some of the study intersections during construction. Even with the implementation of mitigation measure TRANS-A and TRANS-B, the impact would remain significant and unavoidable. However, the aluminum cover alternative would create substantially fewer average and peak construction-related daily vehicle trips compared to the proposed project.

- Both the aluminum cover alternative and the proposed project would create a significant impact to the level of service on the study roadway segments during construction. However, the aluminum cover alternative would create substantially fewer average and peak construction-related daily vehicle trips compared to the proposed project.
- Both the aluminum cover alternative and the proposed project would create significant impacts related to potential safety hazards to vehicles traveling on Mulholland Drive near the SCRC gate, primarily from trucks exiting the site. With the implementation of mitigation measures TRANS-B through TRANS-D, these impacts would be reduced to a less than significant level under both the aluminum cover alternative and the proposed project. However, the aluminum cover alternative would create substantially fewer average and peak construction-related vehicle trips compared to the proposed project.
- Because the aluminum cover alternative would not provide public access to the SCRC for passive recreation, the potential safety hazard at the Mulholland gate during the operations phase would be eliminated.
- Unlike the proposed project, the aluminum cover would not create a significant impact to CMP facilities in the project vicinity during project construction.
- The proposed project would create a less than significant impact related to traffic and parking during post-construction project operations. Because the aluminum cover alternative would generate no additional post-construction traffic or maintenance activity at the SCRC from passive recreation use, it would create no impact related to traffic and parking during post-construction operations.

5.4 Environmentally Superior Alternative

In accordance with Section 15126.6(e)(2) of the CEQA Guidelines, an EIR shall identify an environmentally superior alternative among the alternatives, including the proposed project. Most impacts related to the floating and aluminum covers would be reduced compared to the proposed project because these alternatives involve less ground disturbance, truck traffic, and construction time than the proposed project. These include impacts related to air quality/greenhouse gas emissions, biological resources, cultural resources, noise, and transportation/traffic. Both the floating cover alternative and the aluminum cover alternative (including the solar panel option) would eliminate the significant and unavoidable impact to wildland fire because public access to the SCRC would not be permitted under these alternatives. Impacts related to air quality/greenhouse gas emissions, noise, and transportation/traffic would be less under the floating cover alternative than under the aluminum cover alternative due to the reduced scope of construction required. Further, the floating cover alternative would eliminate significant impacts to biological resources and cultural resources without implementation of mitigation because ground disturbing activities would be limited to essentially the existing Upper Stone Reservoir footprint. Lastly, the floating cover alternative would eliminate short-term construction impacts from TACs. As such, the floating cover alternative is considered the environmentally superior alternative. The floating cover alternative would meet the two primary project objectives. It would maintain local drinking water storage capacity within the SCRC service area. However, this alternative would not meet the secondary project objective of helping to restore the natural character of those portions of Stone Canyon involved in the project improvements. Table 5-23 provides a comparison of the impacts of the alternatives to those of the proposed project.

Table 5-23 Comparison of Impacts for the Proposed Project and the Alternatives

Impact Area	Proposed Project	Floating Cover Alternative	Aluminum Cover Alternative	Aluminum Cover Alternative w/ Solar Panels
Aesthetics				
VIS-1: The proposed project would not have a substantial adverse effect on a scenic vista.	Less than significant	Less than significant (Similar)	Less than significant (Similar)	Less than significant (Similar)
VIS-2: The proposed project would not substantially degrade the existing visual character or quality of the site and its surroundings.	Less than significant	Less than significant (Similar)	Less than significant (Similar)	Less than significant (Similar)
Air Quality				
AIR-1: During the construction phase, the proposed project would violate the air quality standards for nitrogen oxides (NO_x) and particulate matter (PM_{10} and $PM_{2.5}$), and contribute substantially to an existing or projected air quality violation.	Significant & unavoidable	Significant & unavoidable (Less)	Significant & unavoidable (Less)	Significant & unavoidable (Less)
AIR-2: The proposed project would expose sensitive receptors to substantial pollutant concentrations of PM_{10}, $PM_{2.5}$, and toxic air contaminants (TACs) during construction.	Significant & unavoidable	Significant & unavoidable (Less)	Significant & unavoidable (Less)	Significant & unavoidable (Less)
AIR-3: The proposed project would not generate greenhouse gas emissions, either directly or indirectly, that would have a significant impact on the environment or conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases.	Less than significant	Less than significant (Less)	Less than significant (Less)	Less than significant (Less)
Biological Resources				
BIO-1: The proposed project would have a substantial adverse effect, either directly or through habitat modifications, on species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or the U.S. Fish and Wildlife Service.	Less than significant with mitigation	No impact (Less)	Less than significant with mitigation (Less)	Less than significant with mitigation (Less)
BIO-2: The proposed project would not have a substantial adverse effect on riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or the U.S. Fish and Wildlife Service.	No impact	No impact (Similar)	No impact (Similar)	No impact (Similar)
BIO-3: The proposed project would not have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.	No impact	No impact (Similar)	No impact (Similar)	No impact (Similar)

Impact Area	Proposed Project	Floating Cover Alternative	Aluminum Cover Alternative	Aluminum Cover Alternative w/ Solar Panels
BIO-4: The proposed project would not interfere substantially with the movement of native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.	Less than significant	No impact (Less)	Less than significant (Similar)	Less than significant (Similar)
BIO-5: The proposed project would conflict with local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.	Less than significant with mitigation	No impact (Less)	Less than significant with mitigation (Less)	Less than significant with mitigation (Less)
Cultural Resources				
CR-1: The proposed project would not cause a substantial adverse change in the significance of a historical resource.	Less than significant	Less than significant (Similar)	Less than significant (Similar)	Less than significant (Similar)
CR-2: The proposed project could cause a substantial adverse change in the significance of an archaeological resource.	Less than significant with mitigation	Less than significant (Less)	Less than significant with mitigation (Less)	Less than significant with mitigation (Less)
CR-3: The proposed project could directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.	Less than significant	Less than significant (Less)	Less than significant (Less)	Less than significant (Less)
Wildland Fire				
FIRE-1: The proposed project would expose people or structures to a significant risk of loss, injury, or death involving wildland fires.	Significant and unavoidable	No impact (Less)	No impact (Less)	No impact (Less)
Land Use				
The proposed project would not conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to, the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect.	No Impact	Less than significant (Greater)	Less than significant (Greater)	Less than significant (Greater)
Noise/Vibration				
NOISE-1: Construction of the proposed project would expose persons to or generate noise levels in excess of City standards and create a substantial temporary increase in ambient noise levels in the vicinity of the project site.	Significant & unavoidable	Significant & unavoidable (Less)	Significant & unavoidable (Less)	Significant & unavoidable (Less)
NOISE-2: Operation of the proposed project would not expose persons to noise levels in excess of City standards.	Less than significant	No impact (Less)	No impact (Less)	No impact (Less)
NOISE-3: Construction and operation of the proposed project would not expose people to excessive groundborne vibration.	Less than significant	Less than significant (Similar)	Less than significant (Similar)	Less than significant (Similar)

Impact Area	Proposed Project	Floating Cover Alternative	Aluminum Cover Alternative	Aluminum Cover Alternative w/ Solar Panels
Transportation/Traffic				
TRANS-1: The proposed project would conflict with an applicable plan, ordinance, or policy for establishing measures of effectiveness for the performance of the circulation system at study intersections and on study roadway segments during construction.	Significant & unavoidable	Significant & unavoidable (Less)	Significant & unavoidable (Less)	Significant & unavoidable (Less)
TRANS-2: Construction activity would exceed the level of service standards established by the county congestion management agency for designated roads or highways.	Less than significant with mitigation	Less than significant (Less)	Less than significant (Less)	Less than significant (Less)
TRANS-3: The proposed project would create a safety hazard during construction on Mulholland Drive associated with incompatible uses.	Less than significant with mitigation	Less than significant with mitigation (Less)	Less than significant with mitigation (Less)	Less than significant with mitigation (Less)
TRANS-4: The proposed project would not result in inadequate parking supply.	Less than significant	No impact (Less)	No impact (Less)	No impact (Less)

Notes: Less: Impact is lower in magnitude than the impact of the proposed project
Similar: Impact is similar in magnitude to impact of the proposed project
Greater: Impact is greater in magnitude than the impact of the proposed project

CHAPTER 6
ACRONYMS AND ABBREVIATIONS

AC	alternating current
ADT	Average Daily Traffic
AQMP	Air Quality Management Plan
ATCS	Adaptive Traffic Control System
ATSAC	Automated Traffic Surveillance and Control
California Register	California Register of Historic Places
Cal-IPC	California Invasive Plant Council
Caltrans	State of California Department of Transportation
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resources Board
CDFG	California Department of Fish and Game
CEQA	California Environmental Quality Act
cfs	cubic feet per second
CH_4	methane
CMA	Critical Movement Analysis
CMP	Congestion Management Program
CNEL	Community Noise Equivalent Level
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	CO_2 equivalent
CPOR	Coalition to Preserve Open Reservoirs
CY	cubic yard
dB	decibel
dBA	A-weighted decibel
DC	direct current
D-DBPR	Stage 2 Disinfectants and Disinfection Byproducts Rule
EIR	Environmental Impact Report
EPA	Environmental Protection Agency
°F	degrees Fahrenheit
GHG	greenhouse gases

GIS	Geographic Information System
I-405	Interstate 405, San Diego Freeway
LADOT	Los Angeles Department of Transportation
LADRP	Los Angeles Department of Recreation and Parks
LADWP	Los Angeles Department of Water and Power
LAFD	Los Angeles Fire Department
L_{eq}	equivalent noise level
LOS	level of service
Lower Reservoir	Lower Stone Canyon Reservoir
LST	localized significance threshold
LT2ESWTR	Long Term 2 Enhanced Surface Water Treatment Rule
MG	million gallons
$\mu g/m^3$	micrograms per cubic meter
mph	miles per hour
MW	megawatt
N_2O	nitrous oxide
National Register	National Register of Historic Places
NO	nitric oxide
NO_2	nitrogen dioxide
NOP	Notice of Preparation
NO_X	nitrogen oxide
O_3	ozone
OS	Open Space
Pb	lead
PM_{10}	respirable particulate matter
$PM_{2.5}$	fine particulate matter
ppm	parts per million
PV	photovoltaic
ROG	reactive organic gases
SCAQMD	South Coast Air Quality Management District
SCRC	Stone Canyon Reservoir Complex
SO_2	sulfur dioxide
SO_x	sulfur oxide
TAC	toxic air contaminant
Upper Reservoir	Upper Stone Canyon Reservoir

USFWS	United States Fish and Wildlife Service
V/C	volume-to-capacity
VHFHS	Very High Fire Hazard Severity
VOCs	volatile organic compounds

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CHAPTER 7
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