

SONGS Units 2 and 3

EIE Executive Summary

Revision 1
June 2, 2014



ES 1.0 INTRODUCTION

To support the post shutdown decommissioning activities report (PSDAR), Southern California Edison (SCE) evaluated the environmental impacts of decommissioning San Onofre Nuclear Generating Station (SONGS) Units 2 & 3 to determine if anticipated impacts are bounded by existing environmental impact statements (EISs), primarily the U.S. Nuclear Regulatory Commission's (NRC's) decommissioning generic EIS (GEIS), NUREG-0586, Supplement 1, *Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities, Supplement 1* (referred to herein as the decommissioning GEIS) (NRC 2002). In the decommissioning GEIS, the NRC reviewed most of the environmental impacts resulting from decommissioning on a generic basis, but requires site-specific analyses for threatened and endangered species and environmental justice.

The NRC considered various activities that are performed in conjunction with decommissioning but are reviewed and regulated by the NRC under other licenses as outside the scope of decommissioning impacts. These out-of-scope impacts include impacts related to the decision to permanently cease operations, impacts from spent fuel management in wet or dry storage, impacts from spent fuel transport and disposal away from SONGS, and the treatment and/or disposal of low-level radioactive waste at a licensed facility.

ES 2.0 PLANT LOCATION AND DESCRIPTION

SONGS 2 & 3 is located in northern San Diego County, California, approximately 51 miles north-northwest of the city of San Diego. The nearest developed community is San Clemente, which is 5 miles north-northwest of SONGS in Orange County. The SONGS site lies entirely within the boundaries of the Marine Corp Base Camp Pendleton under a grant of easement between SCE and the United States Government. The site is bounded on the west by the Pacific Ocean; on the east by eight-lane Interstate Highway 5 (I-5) and the railroad tracks owned by the North County Transit District of San Diego, that pass within 1,000 feet of the station site; and on both the north and south along the coastline by San Onofre State Beach. The coastal side of the OCA industrial area is protected by a seawall and a public walkway that permits transit between open beach areas upcoast and downcoast from the site. (SONGS 2013)

The principal structures of SONGS 2 & 3 consist of two reactors with containment structures, turbine buildings, auxiliary building, diesel generator buildings, fuel handling buildings, switchyard, security building, maintenance building, administrative buildings, and cooling system intake and discharge structures. The water from the Pacific Ocean is supplied to the cooling water systems within separate intake conduits for each unit and cooling water flows return to the Pacific Ocean through separate discharge conduits. The onsite independent spent fuel storage installation (ISFSI) is a fenced, protected area located within the Unit 1 industrial area, dedicated to the storage of dry spent fuel from Units 1, 2, and 3. (SONGS 2013)

ES 3.0 DECOMMISSIONING ACTIVITIES

SONGS will be utilizing the decommissioning method of decontamination and dismantlement (DECON). Structures will be demolished to grade or below. Building demolition will be performed using conventional means (with no explosives). (Energy Solutions 2014) The removal of structures, including subsurface structures, will be in accordance with NRC regulations for unrestricted release of the property at license termination and U.S. Navy requirements for return of the SONGS property.

The intake and discharge conduits on the seabed are subject to the terms of the California State Lands Commission (CSLC) easement lease for this offshore land. The easement lease calls for removal of structures, building, pipelines, machinery, and facilities placed or erected by lessee and restoration as nearly as possible to the conditions existing prior to their erection or placement (CSLC 1985). However, SCE plans to pursue an amendment to allow abandonment in place of the conduits with removal of vertical risers.

Spent fuel will be stored in the ISFSI until it is accepted by the DOE. After all fuel has been removed from the ISFSI, the ISFSI will be decommissioned and remaining miscellaneous structures will be demolished and removed from the site as required for lease termination. SCE plans to enter into a separate agreement with the U.S. Navy to allow for the continued use of the existing switchyard. With the exception of the switchyard and other structures that are left in place as agreed to by the U.S. Navy, the site will be restored to meet the agreements with the U.S. Navy and any applicable state permit requirements, and the license and grant of easement will be officially terminated.

ES 4.0 ENVIRONMENTAL IMPACT EVALUATION

SCE assessed the potential for environmental impacts to each resource area from the decommissioning activities using evaluations in the decommissioning GEIS as a guide. Like the decommissioning GEIS, the analysis assumed that operational mitigation measures would be continued and did not rely on the implementation of new mitigation measures unless specified. Environmental releases, waste volumes, and other environmental interfaces were estimated. These data were then assessed against the potential for impact and the existing environmental conditions at SONGS to identify impacts and determine a significance level of SMALL (impacts are not detectable or are so minor that they will neither destabilize nor noticeably alter any important attribute of the resource or do not exceed permissible levels in the NRC's regulations), MODERATE (impacts are sufficient to alter noticeably, but not to destabilize, important attributes of the resource), or LARGE (impacts are clearly noticeable and are sufficient to destabilize important attributes of the resource.).

To support the evaluation, SCE established the baseline environmental and societal conditions through site-specific information and vicinity and regional data available from local, state, and federal agencies. In addition, the evaluation considered the existing permit conditions and limitations for water and air permits and NRC regulatory requirements, including those focused on occupational dose, public dose, annual radiological effluents, and radioactive waste shipping. Federal, state, and local requirements for non-radiological interfaces with the environment were

considered such regulations limitations on water withdrawal and discharges, air emissions including fugitive dust, noise levels, protection of terrestrial and aquatic species, protection of cultural resources, disposal of non-radiological waste, and worker health protection.

SCE reviewed the planned decommissioning activities for SONGS and compared these to the decommissioning activities that NRC reviewed in the decommissioning GEIS. The planned activities fall within the activities that NRC reviewed. No unique site-specific features or unique aspects of the planned decommissioning have been identified. Furthermore, the methods used to accomplish these individual tasks will employ conventional methods.

SCE's review confirmed that the anticipated or potential impacts are within the bounds of the generic impacts that the NRC described in the decommissioning GEIS. There are no applicable bounding impacts for threatened and endangered species and environmental justice. This evaluation presents these site-specific analyses, determining that the planned SONGS 2 & 3 decommissioning activities are not anticipated to result in significant impacts to threatened and endangered species or disproportionate impacts on minority or low-income populations. The following discussions summarize review and the reasons for reaching this conclusion.

ES 4.1 Onsite/Offsite Land Use

SCE decommissioning plans include building demolition and removal within the 83.63-acre easement hosting the SONGS 2 & 3 reactor units and infrastructure. SCE plans are to seek an easement lease amendment from the CSLC for the abandonment of the SONGS 2 & 3 intake and discharge conduits on the seabed with limited removal activities. To support dismantlement of structures, SCE may opt to utilize leased SONGS parcels outside the 83.63-acre easement on the west side of I-5 for decommissioning activities, e.g. staff parking, temporary non-radiological equipment storage, etc. In addition, the existing rail spur serving the site will be used in support of radioactive waste shipments.

The SONGS site is currently used for utility-related industrial land uses, with the majority of the property within the easement having been previously disturbed during construction and operation of the plant. The coastal bluff areas located in the northwest and southeast portions of the 83.63-acre easement have remained undeveloped in compliance with the California Coastal Commission (CCC) guarantee agreement in which SCE guarantees that they will be protected and that they will remain in their natural state (CCC 1974). It is anticipated that there would be no changes in onsite land use patterns during decommissioning. Any offsite land that may be utilized for decommissioning activities is anticipated to be associated with parcels already leased by SONGS from the U.S. Navy on the west side of I-5. These parcels are currently utilized to support SONGS activities, and no land use change inconsistent with current utilization is expected during decommissioning.

NRC's generic assessment for land use was that the impact would be SMALL for sites that did not require additional land for decommissioning activities and if additional land was needed, and then the impact should be determined on a site-specific basis. Therefore, SONGS onsite land use impacts during decommissioning are bounded by the decommissioning GEIS.

ES 4.2 Water Use

SONGS 2 & 3 acquires potable water through the South Coast Water District, a member agency of the Municipal Water District of Orange County (MWDOC). The site uses water from the Pacific Ocean for its circulating cooling for service water functions. The operational demand for cooling and makeup water was largely eliminated once SONGS 2 & 3 permanently ceased operation. The normal operation demand was previously 830,000 gpm. (SONGS 2013, Section 2.4.13.1)

Water uses for decommissioning include staff usage, fuel removal, large component removal, decontamination and dismantlement, and structure dismantlement. There is also a need for dewatering during decommissioning activities. Water uses, including dewatering volumes, are anticipated to be significantly less than water use during operation. The decommissioning GEIS generically determined water use impacts to be SMALL (NRC 2002, Section 4.3.2.4); therefore, SONGS's water use impacts during decommissioning are bounded by the decommissioning GEIS.

ES 4.3 Water Quality

Major activities that could impact surface and groundwater quality during decommissioning include fuel removal, stabilization, decontamination and dismantlement, structure dismantlement, and dewatering. These activities could lead to accidental spills, migration of low concentrations of radioactivity or hazardous substances not previously identified, and leaching from abandoned in place concrete subsurface structures.

SONGS 2 & 3 discharges are regulated by National Pollutant Discharge Elimination System (NPDES) permits issued by the California Regional Water Quality Control Board (CRWQCB) (CRWQCB 2006). Storm water is regulated and controlled through an industrial storm water general permit issued by the CRWQCB. The SONGS spill prevention control and countermeasures (SPCC) plan and storm water pollution prevention plan will be updated as necessary to address decommissioning activities. SCE will acquire the appropriate permit or modification of its NPDES permit for discharge of water pumped from dewatering wells.

An SCE review concluded that no drinking water pathway exists for exposure from SONGS operations (SONGS 2007); furthermore, the nearest drinking water well is more than one mile inland. Previous studies (SONGS 2007) indicate that even under extreme pumping conditions, a seaward gradient will exist, so dewatering is not expected to result in saltwater intrusion. Compliance with the CRWQCB policy to maintain a seaward gradient would also ensure against saltwater intrusion.

SCE will follow standard work and best management practices (BMPs) and comply with SPCC plans to minimize the chance of groundwater contamination. In the event an unknown area of hazardous substances is identified during sub-grade soil excavation and structures removal, the area will be assessed and controlled. Due to the implementation of BMPs, compliance with permits, and the unlikelihood of low concentrations of hazardous substances, the potential impacts of decommissioning on nonradioactive aspects of water quality for both surface water and groundwater are considered SMALL. In its decommissioning GEIS, the NRC generically

determined water quality impacts to be SMALL (NRC 2002, Section 4.3.3.4); therefore, SONGS 2 & 3's water quality impacts during decommissioning are bounded.

ES 4.4 Air Quality

Emission sources in San Diego County are primarily mobile sources and violations of ambient air quality standards for particulate matter are persistent. Relatively minor stationary sources are in use at SONGS that result in annual emissions that are a fraction of the average daily emissions for the San Diego Air Pollution Control District (SDAPCD).

The most likely impact of decommissioning on air quality would be due to fugitive dust. SCE will include standard dust control measures during decommissioning in accordance with SDAPCD dust abatement requirements. Air emissions due to commuting workers will also be less since the work force during decommissioning is expected to be smaller than the number of workers used for construction or refueling outages.

The NRC's decommissioning GEIS generically determined air quality impacts associated with decommissioning to be SMALL due to the sufficiency of current and commonly used control and mitigation measures (NRC 2002, Section 4.3.4). SCE will implement standard mitigating measures to reduce particulate matter and ozone emissions during decommissioning, per the requirements of the SDAPCD. Therefore, air quality impacts related to decommissioning of SONGS 2 & 3 are bounded by the decommissioning GEIS.

ES 4.5 Aquatic Ecology

SCE has characterized the aquatic environment in the vicinity of the SONGS 2 & 3 intake and discharge conduits prior to construction and during entrainment and impingement studies completed in 2008 (SCE 2008). There are a variety of habitat types surrounding the SONGS 2 & 3 conduits. The fish habitat offshore of SONGS consists of a mixture of sand, cobble, and isolated areas of exposed rock. The area of richest marine productivity in the immediate vicinity of the plant site is the shallow sub-tidal zone, approximately 1,300 ft up the coast from SONGS. This area supports a biological community dominated by surfgrass and feather boa kelp. The San Onofre kelp bed is approximately 650 ft down the coast from the SONGS Unit 2 diffusers at a depth of about 40 to 50 ft. The benthic (bottom) community is generally dominated by queenfish (*Seriphus politus*); northern anchovy (*Engraulis mordax*); white croaker (*Genyonemus lineatus*); and speckled sanddab (*Citharichthys stigmaeus*). (SCE 2008)

Since ceasing permanent operations at SONGS 2 & 3, SCE has continued water withdrawals and discharge to support cooling for SONGS 2 & 3 spent fuel pools at approximately 96 percent reduction from normal operating flows (SCE 2013a). Management of spent fuel is not considered a decommissioning activity and its impacts are out-of-scope for assessing impacts from decommissioning. SONGS will comply with its NPDES permit, applicable Clean Water Act Section 316(b)-related regulations, and California's once-through cooling policy addressing reduction of impingement and entrainment impacts due to water withdrawals.

SCE plans to pursue an amendment to the CSLC easement lease for SONGS 2 & 3 intake and discharge conduits on the seabed. If the CSLC approves the amendment to allow SCE to abandon the conduits in place after removing the vertical risers, the environmental impacts are projected to be SMALL with the application of mitigation measures enumerated in the lease amendment. Complete removal of the conduits, as is currently required by the CSLC easement lease, is anticipated to have environmental impacts that are greater than SMALL. If the CSLC easement lease is not amended, the environmental impacts from complete removal of the conduits would be evaluated at that time.

There are no surface water bodies on the SONGS site, but the Pacific Ocean borders the site and vernal pools are found northwest of SONGS Parking Lot #4. Decommissioning activities for SONGS 2 & 3 would include the application of common BMPs, compliance with the SONGS storm water permit, and implementation of the storm water pollution prevention plan, which would be updated as necessary to address decommissioning activities. These measures would ensure that any changes in surface water quality will be non-detectable and non-destabilizing.

The potential impacts to aquatic ecology would be SMALL, and no additional mitigation measures beyond those anticipated as a condition of the CSLC easement lease amendment are warranted. The NRC generically determined aquatic ecology impacts to be SMALL when only aquatic resources within a plant's operational areas is disturbed (NRC 2002, Section 4.3.5.4); therefore, the aquatic ecology impacts during the decommissioning of SONGS 2 & 3 are bounded by the decommissioning GEIS.

ES 4.6 Terrestrial Ecology

SONGS 2 & 3 is almost entirely paved and developed. However, there are several small strips of intact scrub-shrub habitat and ornamental vegetation surrounding the parking lots and between developed areas of the plant. The SONGS site also has undeveloped coastal bluffs that are explicitly protected from development under the CCC coastal development permit. The onsite coastal bluff in the northwest area of SONGS 2 & 3 is sparsely vegetated, California desert-thorn scrub habitat (BonTerra 2012a). The larger onsite coastal bluff in the southeast area of SONGS 2 & 3 is approximately 5 acres (CCC 1974) and is dominated by California sagebrush scrub vegetation (BonTerra 2012a). This bluff is contiguous with the San Onofre bluffs of the San Onofre State Beach which supports two native vegetation associations (Diegan coastal sage scrub and southern foredune) and small areas of disturbed coastal sage scrub habitat (Odgen 1994). The coastal bluff areas provide opportunity to support wildlife however, the light, noise, and frequent human presence due to the proximity of SONGS structures and activities; the highway, beach road, and railroad; and frequent human presence on the state beach would provide a more disturbed habitat than optimal for many species. Avian species are highly mobile and not subject to barriers such as roads and developed areas that would deter ground-limited organisms, and may utilize scrub habitat or open surfaces for nesting and temporary perching.

The decommissioning activities would include dust generation due to structure demolition, noise from dismantlement of facilities and heavy equipment traffic, surface runoff, emissions from construction equipment, and potentially bird collisions with crane booms or other construction

equipment. The decommissioning activities will be conducted in compliance with air quality and noise regulations, and SCE will use avoidance and minimization measures to address potential impacts. Compliance with applicable regulations, air permits, noise restrictions related to daylight working along with the temporary nature of the various decommissioning tasks (e.g., use of cranes) will minimize the impacts to terrestrial species as well as the human community. Decommissioning plans do not include the use of explosives, whose noise could disturb terrestrial resources.

SONGS is located within the coastal zone and prior to active dismantlement, SCE will file a coastal development permit application with the CCC. As part of this permitting process, decommissioning activities within the coastal sage habitat areas, coastal bluff, and beach areas will be reviewed by the CCC for potential environmental impact particularly for the federally listed coastal California gnatcatcher (*Polioptila californica californica*) and other protected species and species of concern. The need to implement mitigation measures would be conditions of the CCC permit. The removal of security barriers along the perimeter of the developed plant adjacent to and within the natural area could potentially require ground disturbance in unpaved areas. Appropriate avoidance and minimization measures will be used to minimize the impact of any ground disturbance.

With the implementation of appropriate avoidance and minimization measures and compliance with permit conditions as discussed above, decommissioning of SONGS Units 2 & 3 is not anticipated to adversely impact any terrestrial resources and the impacts would be SMALL. Therefore, SONGS 2 & 3's terrestrial ecology impacts during decommissioning are bounded by the decommissioning GEIS.

ES 4.7 Threatened and Endangered Species

Seventeen federally or state-protected species utilize habitat within a 6-mi radius (vicinity) of the SONGS site. These species are listed in Table ES4.7-1, along with their protection status and critical habitat designation. The list includes four federally listed marine turtles; however, none are considered full-time residents in the vicinity of SONGS, as they are mostly transient and only migrate through the vicinity. Another federally listed marine reptile, the Hawksbill turtle (*Eretmochelys imbricata*), sporadically nests in the southern part of the Baja peninsula and foraging sub-adults and juveniles have been sighted along the California coast (NOAA 2013a).

The decommissioning activities would indirectly impact protected species through dust generation due to structure demolition, noise from dismantlement of facilities and heavy equipment traffic, surface runoff, emissions from construction equipment, and potentially bird collisions with crane booms or other construction equipment. The decommissioning activities will be conducted in compliance with air quality and noise regulations and SCE will use avoidance and minimization measures. Compliance with applicable regulations, air permits, noise restrictions related to daylight working along with the temporary nature of the various decommissioning tasks (e.g., use of cranes) will minimize the impacts. Decommissioning plans do not include the use of explosives, whose noise could disturb protected species. These mitigation measures would serve to minimize impacts to protected terrestrial species that inhabit or visit the SONGS site.

SCE will also employ other measures such as planning decommissioning activities to avoid and further minimize potential impacts during the nesting season to ensure species, such as the coastal California gnatcatcher, are not significantly impacted. Based on SCE's experience with SONGS Unit 1 decommissioning, it is assumed that the CCC will condition the SONGS 2 & 3 coastal development permit to ensure that there are no significant impacts to special-status species. For the Unit 1 decommissioning, the CCC analyzed the potential for decommissioning activities to impact the coastal California gnatcatcher's habitat and determined that there would be no significant impacts (CCC 2000).

Only one of the protected species in the vicinity of SONGS is a plant species, the thread-leaved brodiaea. It was not identified during a 2012 survey of the site (BonTerra 2012c).

Decommissioning activities will be confined to paved areas unless the SONGS environmental department has first conducted an environmental assessment per its environmental procedure, "Handling and Treatment of Endangered and Threatened Species" (SO123-IX-2.9) that serves to protect threatened and endangered species. The procedure requires that the SONGS environmental protection group conduct assessments prior to any land disturbance, soil addition, digging, grading, or trenching outside the paved and concreted areas; maintenance activities near surface water and wetlands; and trimming or removal of native plants other than landscape maintenance. Therefore, impacts on thread-leaved brodiaea are not anticipated.

In addition to federal- and state-listed species, SCE also reviewed impacts to species identified within the California Natural Diversity Database as imperiled or critically imperiled that have been recorded as being observed within approximately one mile of the SONGS site. The SCE review indicated that impacts, if any, to these species would be minimized through the implementation of the avoidance and mitigation measures applicable to the protection of the listed species.

Decommissioning of SONGS 2 & 3 is not anticipated to adversely impact any federally or state-listed species. As discussed above, decommissioning activities would be limited to paved areas onsite and nearshore and offshore disturbance to support removal of intake and outfall risers and potential temporary disturbance on the beach for seawall and walkway removal activities. SCE will employ mitigation measures as required by California agencies to minimize impacts to the environment and protect listed species. In addition, SCE will implement BMPs and conduct assessments as called for in its environmental protection procedure, as well as comply with permit and regulatory requirements to minimize indirect impacts from noise, air emission, dust, and run-off. Therefore, it is reasonable to conclude that impacts to threatened or endangered species from decommissioning would be SMALL.

Table ES 4.7-1 Species of Concern Identified within the Vicinity^(a) of SONGS

| Scientific Name | Common Name | State Status^(b) | Federal Status^(c) | Critical Habitat within Vicinity |
|-------------------------------------------|-------------------------------------|-----------------------------------|-------------------------------------|-----------------------------------------|
| AMPHIBIAN SPECIES | | | | |
| <i>Anaxyrus californicus</i> | Arroyo toad | — | FE | yes ^(d) |
| AVIAN SPECIES | | | | |
| <i>Athene cunicularia</i> | Burrowing owl | (e) | — | no |
| <i>Charadrius alexandrinus nivosus</i> | Western snowy plover | — | FT | yes ^(d) |
| <i>Empidonax traillii extimus</i> | Southwestern willow flycatcher | SE | FE | no |
| <i>Haliaeetus leucocephalus</i> | Bald eagle | SE | delisted | no |
| <i>Poliotilacalifornica californica</i> | Coastal California gnatcatcher | — | FT | yes ^(d) |
| <i>Vireo bellii pusillus</i> | Least Bell's vireo | SE | FE | yes ^(d) |
| FISH SPECIES | | | | |
| <i>Orcorhynchus mykiss</i> | Steelhead trout | — | FE | yes ^(d) |
| INVERTEBRATE SPECIES | | | | |
| <i>Branchinecta sandiegoensis</i> | San Diego fairy shrimp | — | FE | yes ^(d) |
| <i>Coelus globosus</i> | Globose dune beetle | (e) | — | no |
| <i>Streptocephalus woottoni</i> | Riverside fairy shrimp | — | FE | no |
| MAMMALIAN SPECIES | | | | |
| <i>Chaetodipus californicus femoralis</i> | Dulzura pocket mouse | (e) | — | no |
| <i>Chaetodipus fallax fallax</i> | Northwestern San Diego pocket mouse | (e) | — | no |
| <i>Dipodomys stephensi</i> | Stephen's kangaroo rat | ST | FE | no |
| <i>Perognathus longimembris pacificus</i> | Pacific pocket mouse | — | FE | no |
| PLANT SPECIES | | | | |
| <i>Atriplex coulteri</i> | Coulter's saltbush | (e) | — | no |
| <i>Atriplex pacifica</i> | South coast saltscale | (e) | — | no |
| <i>Brodiaea filifolia</i> | Thread-leafed brodiaea | SE | FT | yes ^(d) |
| <i>Eryngium pendletonense</i> | Pendleton button-celery | (e) | — | no |
| <i>Myosurus minimus ssp. apus</i> | Little mousetail | (e) | — | no |

| Scientific Name | Common Name | State Status ^(b) | Federal Status ^(c) | Critical Habitat within Vicinity |
|------------------------------|------------------------|-----------------------------|-------------------------------|----------------------------------|
| REPTILIAN SPECIES | | | | |
| <i>Caretta caretta</i> | Loggerhead sea turtle | — | FE | no |
| <i>Chelonia mydas</i> | Green sea turtle | — | FT | no |
| <i>Dermochelys coriacea</i> | Leatherback sea turtle | — | FE | no |
| <i>Lepidochelys olivacea</i> | Olive Ridley's turtle | — | FT | no |

(CDFW 2013a; CDFW 2013b; NOAA 2013b; NOAA 2013c; SCE 2014a; USFWS 2013b; USFWS 2013c; USMC 2012)

a. Vicinity includes a 6-mile radius of the SONGS site for state or federal threatened or endangered species. Vicinity includes a 1-mile radius of the SONGS site for other species of concern (see note [e] below).

b. SE = state endangered; ST = state threatened;

c. FE = federally endangered; FT = federally threatened

d. The USFWS has critical habitat delineated within the SONGS site vicinity; however, the designation explicitly excludes MCBCP land.

e. Species included in the California Natural Diversity Database (CNDDDB) with a ranking of S1 (critically imperiled) or S2 (imperiled) that has been recorded as observed within one mile of the SONGS site.

ES 4.8 Radiological

Nearly all decommissioning activities have the potential to contribute to radiological impacts. Many activities that take place during decommissioning are generally similar to those that occur during normal operations and maintenance activities. In addition to these decommissioning activities, SONGS 2 & 3 will continue to have gaseous and liquid effluents from maintaining the spent fuel pool(s) operation until the spent fuel is transferred to dry storage and the wet storage systems are decommissioned.

Occupational Dose

SCE reviewed decommissioning activities related to stabilizing systems for wet storage of spent nuclear, transfer of spent fuel into dry storage, and decommissioning, dismantlement, removal of the SONGS 2 & 3 structures, and packaging and loading radiological waste for transport. SCE would expect the SONGS occupational dose to be bounded by the NRC's estimate for occupational dose from decommissioning a pressurized water reactor (PWR) dose. SCE's review took into account that major components of SONGS 2 & 3, which often contribute to area dose rates, are relatively new (steam generators and reactor vessel heads) and the implementation of operational dose reduction efforts (i.e., zinc injection). SCE plans to develop a more detailed estimate to support development and evaluation of decontamination work plans. (SCE 2014b)

The NRC considered estimates for occupational dose in its 1988 review of decommissioning impacts, NUREG-0586 (NRC 1988, Table 4.3-2). In the decommissioning GEIS, the NRC reviewed data available from decommissioning experience subsequent to the 1988 review. Because the range of cumulative occupational doses reported by reactors undergoing decommissioning was similar to the range of estimates for reference plants presented in the 1988 GEIS, the NRC did not update its estimates for occupational dose. (NRC 2002, Section 4.3.8.3)

The regulatory standard for worker exposure is a dose limit per worker rather than a cumulative dose. The decommissioning activities will involve radiological surveys prior to decontamination activities and decommissioning activities will be conducted with ongoing monitoring and radiation protection for personnel. The activities that have potential radiological impacts will be conducted following approved procedures to keep doses as low as reasonably achievable (ALARA) and well within regulatory limits.

Public Dose

SCE intends to keep the public doses attributable to SONGS 2 & 3 decommissioning within the PWR reference plant range estimated by the NRC and to keep the dose ALARA (NRC 1988; SCE 2013d). NRC concluded that reactors undergoing decommissioning could reasonably be expected to have emissions and public doses comparable to or substantially less than the levels experienced during normal operation of those facilities (NRC 2002, Section 4.3.8.3). The SONGS Radiological Environmental Management Plan (REMP) monitoring results demonstrated that the radiological environmental impact of the operation of SONGS through

2012 has been negligible, and the resulting dose to a member of the general public is negligible (SONGS 2012b).

SCE will continue to monitor effluents, comply with all applicable regulatory limits, continue its REMP to assess the impacts to the environment from these effluents annually, and keep worker exposure levels ALARA. SCE estimates that SONGS 2 & 3 decommissioning activities would result in occupational and public doses within NRC estimates. In its GEIS for decommissioning, the NRC generically determined radiological impacts to be SMALL (NRC 2002, Section 4.3.8.4); therefore, SONGS's radiological impacts during decommissioning are bounded by the decommissioning GEIS.

Groundwater Monitoring

A Ground Water Protection Initiative Program exists at SONGS in accordance with the Nuclear Energy Institute Technical Report 07-07. Onsite groundwater monitoring for radioactivity will continue during decommissioning. Groundwater sample data indicated the presence of low but detectable levels of tritium in shallow ground water in the area formerly occupied by Unit 1, attributable to legacy activities. The concentrations of tritium are below all regulatory limits (SONGS 2012a, Section K).

ES 4.9 Radiological Accidents

Many activities that occur during decommissioning are similar to activities that commonly take place during maintenance outages at operating plants such as decontamination and equipment removal. Accidents that could occur during these activities may result in injury and local contamination; however, they are not likely to result in contamination offsite. The only design basis accidents (DBAs) or severe (beyond design basis) accidents applicable to a decommissioning plant are those involving the spent fuel pool. (NRC 2002, Section 4.3.9) The environmental impacts of DBAs, including those associated with the spent fuel pool, were evaluated during the initial licensing process and documented in the final environmental statement (NRC 1981).

The NRC's decommissioning GEIS analysis relied in part on the waste confidence rule regarding spent nuclear fuel related accidents. In the GEIS, the NRC also independently reviewed potential impacts associated with radiological accidents during decommissioning. Based on the low likelihood of a significant accident occurring and design and performance criteria being maintained, the GEIS determined these impacts to be SMALL. SONGS addresses accidents in Chapter 15 of its final safety analysis report (FSAR) (SONGS 2013) and SCE will update the FSAR and emergency plans and implementing procedures to protect health and safety in the event of an accident to cover decommissioning activities, as required. Thus, SONGS's radiological accident impacts during decommissioning are bounded by NRC's decommissioning GEIS.

ES 4.10 Occupational Impacts

SONGS currently has an industrial safety program and safety personnel to promote safe work practices and respond to occupational injuries and illnesses. This safety program will continue to be in effect during decommissioning activities.

SONGS has an average occupational injury rate well below that of the heavy construction industry sector and between the power generation industry as a whole and the nuclear power industry (BLS 2012; SCE 2013g). Decommissioning activities are expected to have a SMALL impact on occupational issues. In its decommissioning GEIS, the NRC generically determined occupational issues impacts to be SMALL (NRC 2002, Section 4.3.10.4); therefore, SONGS's occupational issues impact during decommissioning is bounded.

ES 4.11 Cost

As instructed in NRC Regulatory Guide 1.185, SCE evaluates cost in the PSDAR Section 3.

ES 4.12 Socioeconomics

All of the socioeconomic impacts of decommissioning are related to organizational or staffing changes and decreasing tax revenues. Impacts related to the decision to permanently cease operations are outside the scope of this evaluation; however, SCE determined the staff reduction impacts from the decision to be SMALL, with the staff reduction representing 0.04 percent and 0.03 percent of San Diego County's and Orange County's workforce, respectively.

While SCE has a strong tax presence in San Diego County, the SONGS property assessment is a relatively small portion of San Diego's total tax collections. SCE's contribution to the county property tax collections has been consistently less than 1 percent. SCE's tax obligations will be reduced due to SONGS decommissioning, but SCE and SONGS will continue to contribute to county tax revenues throughout the decommissioning time period and there would be no negative impact to services in the community.

It is anticipated that there would be no changes or impacts to the local community and socioeconomic conditions. In its decommissioning GEIS, the NRC generically determined socioeconomic impacts to be SMALL (NRC 2002, Section 4.3.12.4), and therefore, SONGS socioeconomic impacts during decommissioning is bounded.

ES 4.13 Environmental Justice

Decommissioning activities that may potentially affect identified minority and low-income populations are related to staffing changes and offsite transportation. However, the assessment of environmental justice is related other specific issues (e.g. water use, air quality, etc.). Any decommissioning activity that results in a disproportionate share of negative environmental impacts to identified minority or low-income populations has the potential to be an adverse environmental justice impact.

Environmental justice analyses utilize a 50-mile radius around the plant as the environmental impact area. To complete this evaluation, the 2006–2010 low-income data and 2010 minority population data for California were obtained from the USCB website and processed using ESRI ArcGIS 10.1 software. All census data were downloaded in USCB block group level geography so that the environmental justice evaluations were consistent between the minority and low-income analyses.

The percentage of census block groups exceeding the “Aggregate of All Races” minority population criterion was 30.2 percent based on total number of block groups with population within the 50-mile radius. For the “Aggregate and Hispanic” category, 66 percent of the block groups contained minority populations. (USCB 2013a) The identified minority population closest to SONGS is located in San Clemente, CA, approximately 5 mi northwest of the site in Block Group 60590421082. This census block group contained a total of 678 people, with over 50 percent of the population falling under the “Aggregate and Hispanic” category. (USCB 2013a; ESRI 2013b) When individual race or ethnicity categories were analyzed, no block groups were located within a 6-mile radius that met the criteria for a minority population. The nearest block group from the individual category assessment was Block Group 60590423104. Located approximately 10 mi from SONGS in San Juan Capistrano, CA, this block group had a total population of 2,303 persons, with over 50 percent of the population falling within the “Hispanic or Latino” category. (USCB 2013a; ESRI 2013b)

Within the 50-mile radius of SONGS, 262 of the total 5,046 census block groups (5.2 percent) have low-income individual populations. (USCB 2013b; USCB 2013e) The closest low-income block group (60590423123) that meets the guidance criteria for individuals or families is located approximately 11 mi northwest of SONGS in San Juan Capistrano, CA. No low-income populations were identified in the 6-mile vicinity of SONGS during the environmental justice review (USCB 2013e).

In its decommissioning GEIS, the NRC concluded that adverse environmental justice impacts and associated significance of the impacts must be determined on a site-specific basis. SCE has determined that no significant offsite environmental impacts will be created by SONGS 2 & 3 decommissioning activities. As LIC-203 recognizes (NRC 2013d, page D-2), if no significant offsite impacts occur in connection with the proposed action, then no member of the public would be substantially affected. Therefore, there can be no disproportionately high and adverse impact or effects on members of the public, including minority and low-income populations, resulting from the decommissioning of SONGS 2 & 3.

ES 4.14 Cultural, Historical, and Archeological Resources

No prehistoric or historic archaeological sites or historic sites eligible for listing or listed on the National Register of Historic Places, California Register of Historical Resources, or San Diego County Local Register of Historical Resources are located within the SONGS site easement and no traditional cultural properties are known to be present there either (ICF 2012; SCE 2005). Two prehistoric archaeological sites (CA-SDI-1074 and CA-SDI-4916), and three historic archaeological sites (P-37-024479, concrete culvert beneath Amtrak railroad mainline; P-37-

024480, and P-37-024481, wooden culverts beneath Amtrak railroad mainline) were identified within 0.5 mi of SONGS 2 & 3 (ICF 2012; SCE 2005).

In its decommissioning GEIS, the NRC concluded that for plants where the disturbance of lands beyond the operational areas is not anticipated, the impacts on cultural, historic, and archeological resources would be SMALL (NRC 2002, Section 4.3.14). Decommissioning activities are confined to the SONGS site and adjacent leased parcels and no adverse impacts are anticipated. SONGS's impacts on cultural, historical, and archeological resources during decommissioning fall well within the bounds established by the NRC in the decommissioning GEIS.

ES 4.15 Aesthetic Impacts

In its decommissioning GEIS, the NRC stated that removal of structures is generally considered beneficial to the aesthetic impacts of a site and drew the generic conclusion that for all plants, the potential impacts from decommissioning on aesthetics are SMALL and that any mitigation measures are not likely to be beneficial enough to be warranted (NRC 2002, Section 4.3.15). The aesthetic impact of decommissioning SONGS 2 & 3 would be that of the current aesthetic impact of the plant prior to dismantlement. During dismantlement, the visual intrusion would be temporary and would serve to reduce the aesthetic impact of the site. Therefore, the impacts of SONGS on aesthetic resources during decommissioning are bounded by the decommissioning GEIS.

ES 4.16 Noise

Offsite noise sources that affect the ambient noise environment in the vicinity of SONGS include I-5 and the San Diego Northern Railroad, the ocean, and military operations (SCE 2005). During the decommissioning process, the sounds that might be heard at offsite locations include noise from construction vehicles, grinders, saws, pneumatic drills, compressors, and loudspeakers. Predicted noise ranges from decommissioning activities are 85-90 dBA at 50 ft from the noise source and 65-75 dBA at 500 ft. The timing of noise impacts and the duration or intensity will vary. The nearest sensitive receptors to SONGS 2 & 3 are recreational users of San Onofre State Beach where the ambient noise environment can exceed 70 dBA due to ocean sounds, which could mask some noise from decommissioning. The more intense decommissioning activities would primarily occur approximately 400 ft or more from the beach access public walkway in front of the SONGS seawall.

In its decommissioning GEIS, the NRC generically determined noise impacts associated with decommissioning to be SMALL (NRC 2002, Section 4.3.16). Due to the relatively high ambient noise levels surrounding SONGS, decommissioning activities are not expected to produce noise levels that could impact the activities of humans or threatened and endangered species. In addition, SCE will comply with the local noise regulations for construction sites which restrict the average sound level at the property boundary to 75 dBA between 7 a.m. and 7 p.m. and CCC permit requirements. Therefore, noise impacts during decommissioning of SONGS 2 & 3 are bounded by the previously issued GEIS.

ES 4.17 Transportation

Transportation impacts are dependent on the number of shipments to and from the facility, the type of shipments, the distance that material is shipped, and the number of workers commuting to and from the site. SCE estimated the types and volumes of waste generated during decommissioning to be the following (Energy Solutions 2014, Table 6-4):

- Radioactive waste:
 - Class A – 3,500,000 ft³
 - Class B – 6,700 ft³
 - Class C – 1,500 ft³
 - Greater-than-Class C – 190 ft³
- Mixed (LLWR and hazardous waste) – 3,000 ft³
- Nonradioactive, nonhazardous – 38 million ft³

Transportation infrastructure within the vicinity of SONGS includes one major north-south freeway, I-5, an assortment of local and county roads, passenger and cargo rail service (part of the Los Angeles–San Diego corridor), and an existing rail spur serving the SONGS site. General highway access to SONGS 2 & 3 is via I-5 from the north or south to Basilone Road, and then to State Route (SR) 101 to the entrances for SONGS 2 & 3. The 2011 average annual daily traffic (AADT) count for I-5 at the Basilone Road junction was 132,000 vehicles (Caltrans 2011).

SCE compared the assumptions and analysis inputs used for NRC's analysis with waste volumes estimated for SONGS 2 & 3 decommissioning, transport mode, and disposal facility options. The waste volumes estimated per unit to be shipped would be lower for the high-activity waste and higher for the lower activity waste (i.e., Class A) than the NRC had assumed for its analysis. Two other parameters greatly reduce worker and population exposure. Due to the availability of the rail line, SCE plans to ship the bulk of radiological waste by rail; however, there may be times when truck shipments will be required. The NRC indicates use of rail reduces radiological impacts by more than a factor of 10 over truck shipments (NRC 2002, Section 4.2.17.3). Furthermore, disposal facilities available for SONGS 2 & 3 radiological waste are less than half the distance assumed by NRC in its analysis (i.e., up to approximately 1,100 miles to the 3,000-mile distance assumed by NRC).

The disposal facilities considered in the SCE comparison are Energy Solutions in Clive, Utah, and Waste Control Specialists in Andrews, Texas. Both are licensed for Class A waste, and Waste Control Specialists is also licensed for Class B and C waste. (NRC 2013f) In addition, both facilities can dispose of mixed waste within the LLRW classifications for which they are licensed (Energy Solutions 2013; WCS 2013). The inputs and assumptions, including the assumption that very low-activity waste would have negligible radiological impacts, indicate that

transportation worker and public exposure would be considerably less due to the lower shipping mileage alone, without considering the use of rail for the bulk of LLRW shipments, which offers further reduction in exposure.

SCE will comply with all applicable NRC and U.S. Department of Transportation (DOT) regulations, including Federal Railroad Administration regulations and requirements, and will use approved packaging and shipping containers for the shipping of radiological waste. SCE will also comply with State of California regulations enforced by Caltrans and the California Highway Patrol. The NRC holds the position that its regulations for the transportation of radioactive material are adequate to protect the public against unreasonable risk, and thus compliance with existing regulations would result in radiological impacts that were neither detectable nor destabilizing (NRC 2002). Therefore, the radiological impacts of transporting radiological waste from decommissioning SONGS 2 & 3 would be SMALL and are bounded by the decommissioning GEIS.

SCE estimated a peak of approximately 560 workers during decommissioning (Energy Solutions 2014, Tables 6-2 and 6-3) and the vehicular traffic due to commuting would likely exceed the 200 per peak hour threshold, prompting review for potential to impact traffic congestion as required under the local congestion management plan (SDC 2011). SCE estimated peak truck traffic due to nonradiological waste and scrap metal shipments to be approximately 150 per day. The decommissioning traffic associated with SONGS is considered negligible compared to existing traffic volumes and would not be expected to significantly alter congestion on roadways. In addition, this amount of traffic is not expected to significantly deteriorate roadways. The decommissioning GEIS determined nonradiological transportation impacts of decommissioning to be SMALL (NRC 2002); therefore SONGS nonradiological transportation impacts are bounded.

Offshore activities to remove vertical risers on the intake and discharge conduits would increase vessel traffic in the area. It is not expected that these activities would cause a navigational safety hazard or a substantial delay in the normal movements of commercial or recreational vessels. The environmental impacts review for the Unit 1 conduit disposition indicated that impacts to recreational and commercial transportation would be insignificant (EDAW 2005).

ES 4.18 Irreversible and Irrecoverable Commitment of Resources

SONGS 2 & 3 decommissioning will involve dismantlement and removal of structures and restoration of the property to a state for unrestricted release per NRC regulations in accordance with the criteria for decommissioning in 10 CFR 20, subpart E. Furthermore, the property would be returned to the U.S. Navy under the terms of the lease and further negotiations. Thus, land used for SONGS is not irreversible or irretrievable.

The decommissioning of SONGS 2 & 3 would consume some materials, an irretrievable commitment, including materials for decontamination, solvents, industrial gases, tools, and fuel for construction equipment and transportation of workers and materials to and from the facility. The irreversible commitment of such resources was considered by the NRC in the decommissioning GEIS and their consumption was considered minor.

SONGS 2 & 3 will consume capacity at waste facilities for treatment and disposal of its nonradiological waste. California has multiple facilities permitted for the storage, treatment, and disposal of hazardous waste (CDTSC 2013a). The nonradioactive waste generated from SONGS 2 & 3 decommissioning is assumed to be shipped to an out-of-state landfill due to the moratorium on disposal of decommissioned materials at California nonhazardous landfills imposed by California Executive Order D-62-02 (Energy Solutions 2014, Section 5.0). Landfills permitted to receive the waste and that have available disposal capacity will be used for disposal.

The decommissioning of SONGS 2 & 3 would result in SMALL irretrievable or irreversible commitment of resources. In its decommissioning GEIS, the NRC made the generic determination that the impacts on irreversible and irretrievable commitments are SMALL (NRC 2002, Section 4.3.18.4); therefore, the impact of SONGS on irreversible and irretrievable commitments during decommissioning is bounded.

ES 5.0 CONCLUSION

SCE has performed an environmental review to evaluate environmental impacts associated with decommissioning activities, confirming that the anticipated or potential impacts are within the bounds of the generic impacts that NRC described in the decommissioning GEIS. There are no applicable bounding impacts for threatened and endangered species and environmental justice. The planned SONGS 2 & 3 decommissioning activities are not anticipated to result in significant impacts to threatened and endangered species or disproportionate impacts on minority or low-income populations. This is principally due to the following:

- Planned activities fall within the activities that the NRC reviewed. There are no unique aspects of the plant or decommissioning techniques that would invalidate previously reached conclusions.
- Methods to be employed to dismantle and decontaminate the site are standard construction based techniques fully considered in the GEIS.
- SCE will continue to comply with NRC dose limits and conduct activities in accordance with ALARA principles.
- SCE will continue to comply with the SONGS offsite dose calculation manual, REMP, and the Groundwater Protection Initiative Program during decommissioning.
- SCE will comply with all applicable NRC and DOT regulations, including Federal Railroad Administration regulations and requirements, and use approved packaging and shipping containers for the shipping of radiological waste. SCE will also comply with State of California regulations enforced by Caltrans and the California Highway Patrol.
- SCE will continue to comply with federal, state, and local requirements for non-radiological interfaces with the environment including limitations on water withdrawal and

discharges, air emissions including fugitive dust, noise levels, protection of terrestrial and aquatic species, protection of cultural resources, disposal of non-radiological waste, and worker health protection.

- SCE will seek and comply with an amendment to its CSLC easement lease to largely abandon the intake and discharge conduits in place.
- SCE will seek and comply with a coastal development permit from the CCC for decommissioning.

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NOTE: Reference citations are in accordance with supporting documentation for Chapter 4 of the SCE environmental impact evaluation, and thus are not necessarily sequential. Reference PDFs can be found in the eRoom folder for EIE Chapter 4 references.

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