The following four major phases associated with replacement of the SONGS 2 & 3 steam generators are discussed in this document:

1. Transportation of the RSGs to SONGS 2 & 3 (Replacement Steam Generator Transport Options).

2. Activities at SONGS 2 & 3 to stage and prepare the RSGs in advance of the RFO to install the RSGs (Replacement Steam Generator Preparation).

3. Activities at SONGS 2 & 3 to remove the original steam generators during the RFO and temporarily stage them onsite for segmentation and preparation for shipment to an approved LLRW facility (Original Steam Generator Removal, Staging, and Disposal).

4. Installation of the RSGs and return to service (Replacement Steam Generator Installation and Return to Service).

The above phases associated with the Steam Generator Replacement Project (SGRP) are discussed in Sections 3.1 through 3.4. Section 3.1.3 discusses other RSG transport options considered but not carried forward. Project alternatives that could occur if the Project is not implemented are discussed as part of the No Project Alternative (Section 3.5). Section 3.6 discusses the No Action Alternative assuming that no replacement power and transmission are provided if SONGS 2 & 3 were to cease operation. Section 3.7 discusses alternatives considered but not carried forward.

3.1 REPLACEMENT STEAM GENERATOR TRANSPORT OPTIONS

The RSGs will be transported to the Camp Pendleton Del Mar Boat Basin on Marine Corps Base Camp Pendleton (MCBCP) by traditional shipping methods that do not require environmental assessment. Once the RSGs arrive at the Camp Pendleton Del Mar Boat Basin, they must be transported from the shipping vessel to SONGS 2 & 3. A few options are considered viable for transportation of the RSGs from the Camp Pendleton Del Mar Boat Basin on MCBCP to SONGS 2 & 3. One option is to transport the RSGs by the beach and existing roads, referred to herein as the Beach and Road Route Transport Option (Appendix A provides maps of this route and the other transport options). The Beach and Road Route Transport Option is the preferred transport option. As discussed in Sections 4 and 5, the Beach and Road Route Transport Option is also the environmentally preferred option. Other viable options considered herein are referred to as Inland Transport Options. These options consist of transport by

various roads on MCBCP, Old Highway 101, and Interstate (I-5). One of the Inland Transport Options, however, may be required if a currently unforeseen future event results in rendering the Beach and Road Route Transport Option infeasible. Therefore, SCE is presenting several transportation options (any of which may be used) and is requesting the CPUC to approve all options.

The RSG vendor's manufacturing or shipping schedule is not known at this time. However, it is anticipated that all four RSGs may be delivered in one shipment or two RSGs each in two separate delivery cycles. Accordingly, the range of transport options are currently proposed to occur as follows:

- One or two deliveries of RSGs consisting of the delivery of four or two RSGs, respectively, during each delivery period.
- Use of one or two transporters per delivery cycle.
- Trips along the transport route from the Camp Pendleton Del Mar Boat Basin to SONGS 2 & 3 and back again until the last RSG(s) reach SONGS 2 & 3 as follows:
    - One delivery and one transporter will require a total of seven one-way trips.
    - One delivery and two transporters will require a total of three one-way trips.
    - Two deliveries and one transporter will require a total of three one-way trips per delivery for a total of six one-way trips for both of the two deliveries.
    - Two deliveries and two transporters will require a total of one one-way trip per delivery for a total of two trips for both of the two deliveries.
- Final dismantling of the transporters at SONGS 2 & 3 and removal of the transporters using traditional transportation methods.

The portions of RSG transport routes on MCBCP are not subject to CPUC approval or conditions because MCBCP has exclusive use of Federal land. Therefore, these portions of the transport routes will be subject to the control of MCBCP and related Federal agencies, with appropriate environmental review pursuant to the National Environmental Policy Act (NEPA) and other applicable regulations. SCE will implement all final mitigation measures that may be required through those other processes.

The portions of these routes on Federal land and potential environmental impacts on these Federal lands are described herein to provide continuity with regard to the overall Project. Portions of the routes on and off MCBCP, respectively, are shown on the figures in Appendices A and B.

3.1.1 Beach and Road Route Transport Option

This option consists of transporting the RSGs for approximately 15 miles from the Camp Pendleton Del Mar Boat Basin to SONGS 2 & 3. The Beach and Road Transport Option is depicted in Appendix A, as segments A through E on MCBCP, F off MCBCP, G and H on MCBCP, and I and J off MCBCP. The route proceeds as follows: 1) From the Camp Pendleton Del Mar Boat Basin, north along roads on MCBCP, and along the beach near the Santa Margarita River (segments A and B on Figures A-1 and A-2 of Appendix A); 2) military beach transport roads to unpaved military roads near the Las Pulgas exit of I-5 on MCBCP (segments C and D on Figures A-2 through A-5 of Appendix A); 3) unpaved military roads to just south of Skull Canyon on MCBCP (segment E on Figure A-5 of Appendix A); 4) along a short stretch of I-5 off MCBCP (segment F on Figure A-5 of Appendix A) to bypass Skull Canyon; 5) unpaved military roads and Old Highway 101 on MCBCP (segments G and H on Figures A-5 through A-7 of Appendix A); and 6) along Old Highway 101 to SONGS 2 & 3 off MCBCP (segments I and J on Figures A-7 through A-9 of Appendix A). This route is west of I-5 except for the brief transition to I-5 to bypass Skull Canyon. This route is described in more detail below.

The original steam generators were transported along the beach to SONGS 2 & 3 on a route similar to this option during construction of SONGS 2 & 3 in the late 1970s. The four original steam generators were transported without any safety issues, public inconvenience, or environmental harm. Additionally, the SONGS 1 reactor vessel transportation route has received the required environmental approvals to use the preferred Beach and Road Route Transport Option in the reverse direction . It is also important to note that the MCBCP uses the Beach and Road Transport Option Route for training purposes involving movement along the beach and other roads with heavy, tracked vehicles on a constant, ongoing basis. The beach portion of this route is actually an active military transport road corridor.

3.1.1.1 Schedule

The proposed transportation schedule is currently expected to begin on an appropriate date from October 2008 through February 2009. Each trip will require approximately 8 to 12 days. The actual

time may vary up or down from this estimate. The unloaded return trips will be at faster speeds and will take less time. Transport of each RSG by a transporter will require overnight layovers along the beach portion of the route through this period. The transport will be composed of several activities proceeding in the following general sequence: pre-transport activity, transport corridor preparation (specific to wheel or track vehicles and the surface to be crossed), and transport. The schedule for transport along the beach has been selected to avoid potential adverse impacts on nesting birds as a primary consideration. Therefore, the proposed range of months for transport is important for avoiding such potential impacts. The year of transport is irrelevant to this specific issue. Although we expect this activity to occur from October 2008 through February 2009, the transport could occur during the same months in other years depending on vendor supply, operational considerations, and RFO planning needs without affecting the analyses or conclusions in this document.

3.1.1.2 Barge Unloading and Transport Preparation

The barge will enter the Camp Pendleton Del Mar Boat Basin where the RSGs will be offloaded. The barge will then leave the Camp Pendleton Del Mar Boat Basin after the RSGs are offloaded. The transfer of the RSGs from the barge to the transporter will make use of a temporarily placed ramp, spacer barge, or other suitable construct that serves to bridge the gap between the land at the bulkhead and the barge. A system of mats and/or steel plates may also be used, if necessary, to safely bridge the barge and dock bulkhead gap.

Safe transport of the RSGs depends on favorable weather conditions. The SCE Project Manager will track the weather before transport of each unit. The National Oceanic & Atmospheric Administration (NOAA) National Weather Service Internet site and the Coast Guard Marine Forecast or similar sources will be used as the primary data sources. The threshold for deciding whether to proceed with the transport will be a forecast for no rain that could significantly increase water flow in the Santa Margarita River or beach areas. The river will be monitored by a SCE-appointed monitor for potential excess water flow before transport. The transporter will not depart unless the flow in the riverhead at the beach is at a rate at which the transporter can safely transit and will incorporate guidance for crossing based on best management practices (BMP) specified by the Electric Power Research Institute (EPRI 2002) or a similar source. Using the Scripps Institution of Oceanography Sea Swell Forecast

Model or other suitable model(s), SCE will also confirm that unusually high tide or sea swell levels are not forecasted.

3.1.1.3 Transport Procedure and Route

Specialized transporters will be used to transport the RSGs between the Camp Pendleton Del Mar Boat Basin and SONGS 2 & 3. Several types of transporters may be used, and all have similar characteristics to carry the designated load. The specific type of transporter will be determined closer to Project implementation. The potential range of expected equipment, however, is characterized in the following description. The transporter will be either a self-propelled or a towed system and will use either tracks or rubber tires. The transporter's size and load capability will be within industry standard design specifications to transport the load safely over the route selected. The total weight of the steam generator and transporter is expected to be approximately 750 tons. For the Beach and Road Transport Option, the estimated width of the transporter is expected to be approximately 25 feet, and the total length is expected to be approximately 150 feet. The exact weight, width, and length of the transporter will not be known until after a final vendor is selected. The objective of transporter selection will be to distribute the load safely and uniformly over a large surface area, reducing excessive loads and impacts on existing surfaces (beach sand, dirt road beds, and engineered pavements), and to decrease the potential impact on buried utilities, such as piping, where present or nearby.

The transporter will travel no more than 10 miles per hour during transport of the RSGs. The unloaded return trips will be at faster speeds and will take less time. Even with a self-propelled transporter, one or more prime movers capable of pushing and/or pulling the transporter along the haul route will also be used. The RSGs may be transported during two delivery cycles, with two RSGs shipped per cycle. A maximum of seven trips will be required if all steam generators arrive and are transported simultaneously using one transporter.

After leaving the Camp Pendleton Del Mar Boat Basin, the transporter will travel north on military roads. From the concrete road behind the Camp Del Mar recreational vehicle park at the north end of Camp Pendleton's Camp Del Mar Beach and Recreation Area (Camp Del Mar), the transporter will follow the Amphibious Tracked Vehicle access to proceed to the beach and continue past the Santa Margarita Estuary (segments A and B on Figures A-1 and A-2 of Appendix A). North of the estuary, the transporter will proceed along military transit routes on the beach above the tide line for approximately eight miles

(segment C on Figures A-2 through A-5 of Appendix A). There is a military transport dirt road at this location that heads east-northeast from Red Beach at the MCBCP Uniform Training Area to the Las Pulgas Road Gate (segment D on Figure A-5 of Appendix A). The transporter will follow the dirt road to the Las Pulgas gate and then turn north and follow the MCBCP dirt road that runs parallel to I-5 for approximately 0.2 miles (segment E on Figure A-5 of Appendix A). The transporter will bypass Skull Canyon by transitioning across an open area to the southbound lanes of I-5 through a temporary opening in the MCBCP fence that will be restored following transit (segment F on Figure A-5 of Appendix A). With assistance from Caltrans and California Highway Patrol, appropriate traffic control will be implemented. Smaller support equipment may avoid I-5 by using existing, unmodified military dirt roads through Skull Canyon. These activities will not require grading on the beach or roads.

The transporter will remain on I-5 for approximately 0.2 miles and then transition back to the MCBCP dirt road by passing through a temporary opening in the MCBCP fence that will be restored following transit (segment F on Figure A-5 of Appendix A). The transporter will follow the dirt road north approximately one mile and then move onto paved Old Highway 101 (segment G on Figures A-5 and A-6 of Appendix A). The transporter will continue north on Old Highway 101 for approximately 5.5 miles to the San Onofre State Park Campground, through which the transporter will continue north to the entrance gate and continue north on paved roads to the SONGS 2 & 3 OCA (segments H through J on Figures A-6 through A-9 of Appendix A). Culverts under Old Highway 101 will be protected during their crossings if necessary. The transporter will enter the OCA by either the North or South Access Gates; the entrance gate may require temporary modification to allow the transporter to pass. The transporter will then move within the OCA to the Steam Generator Temporary Staging area.

Matting may be used as necessary to facilitate transport and protect surfaces along portions of the route depending on the type of transporter used. A self-propelled, tracked transporter may not require matting on the beach for these purposes; however, it may require matting on the paved or improved road surfaces. Conversely, a wheeled transporter may require matting on the beach but not on paved or improved road surfaces. Examples of matting applications are described in Section 3.1.1.6.

3.1.1.4 Labor Force

Approximately 60 to 70 personnel will be deployed for transportation activities for the Beach and Road Route Transport Option. SCE personnel will observe and coordinate contractor activity and liason with

appropriate governing authorities. The RSGs will be attended during transport and security will be provided at all times. At least one biological monitor appointed by SCE will be present during transport to observe and implement potential biological mitigation provisions. The labor force used during transport will include both skilled and unskilled labor. No personnel will be housed on the transportation route.

3.1.1.5 Equipment and Material

The associated heavy transportation and support equipment will be diesel, electric, and/or gasoline-operated. Several types of transporters may be used, all with similar characteristics to carry the designated load. The specific type of transporter will be determined at a point closer to Proposed Project implementation. The potential range of expected equipment, however, is characterized in the following description. All of the following equipment will not be used simultaneously.

3.1.1.5.1 Transporter

The transporter is expected to consist of the following or similar equipment:

- Four 450-horsepower (hp), diesel-powered, self-propelled, hydraulic-platform transporters (equivalent hp rating if either wheeled or tracked machines).
- Two 460 hp, diesel-powered prime movers to assist in managing the loads on grades.
- Six 5 hp gasoline powered 110-volt, gasoline-powered generators to drive four 50 hp hydraulic pumps.

3.1.1.5.2 Service Fleet

The service fleet is expected to consist of the following or similar equipment:

- Six 435 hp, diesel-powered tractor/transporters to be used as needed to shuttle gear.
- Three diesel-powered, 18-ton forklifts to move and load equipment onto tractor/transporters and trucks as needed.
- Five 1-ton-capacity, diesel-powered tire/utility/mechanic trucks.
- Eight 200 hp miscellaneous utility vehicles.
- One diesel-powered lifting device to set and remove ramps for barge unloading.

- Four diesel-powered, portable light towers.
- Three gasoline-powered bucket trucks to be used at the boat basin.
- Approximately six gasoline-powered traffic-control vehicles and arrow boards when needed.

All transportation equipment will be fitted with appropriate mufflers and all engines maintained regularly according to manufacturer specifications. The specific pieces of equipment to be used and their configurations may vary from the above list. To assess Project impacts, however, this equipment list provides a representative higher range of equipment reasonably expected to be used.

Materials that will be transported by truck to the site contain fuel, lubricants, and drinking water. Refueling will not be permitted on the beach portion of the route unless an emergency occurs. Potential solid waste (e.g., trash) will be properly disposed of in appropriate receptacles. Work crews will use portable chemical toilets.

3.1.1.6 Matting

Mats may be used to facilitate transport on the beach to minimize disturbance of beach sands and/or to facilitate transit (for instance, a wheeled transporter may require matting, whereas a tracked transporter may not). Suitable, available manufactured mats will be used if needed. As an example, SCE anticipates that such mats may be similar to Soloco's DURA-BASE mats, which are currently available and satisfy the load-carrying design criteria. DURA-BASE or similar mats could be used to facilitate transport of the decommissioned SONGS 1 reactor vessel. If needed for the transport route, each mat will be set in place to cover the area necessary for the width of the transporter. The mats allow weight to be distributed across a large surface area while remaining stable and strong. This type of mat has been used to transport heavy loads through wetlands, marshlands, soft subgrades, beach sands, and areas of open water several inches deep in a range of weather conditions without damaging the underlying environments.

Although the specific mats may vary somewhat from this example, the following description provides a basis to evaluate potential Project impacts. Figures 3-1 through 3-2 depict a conceptual drawing of mat

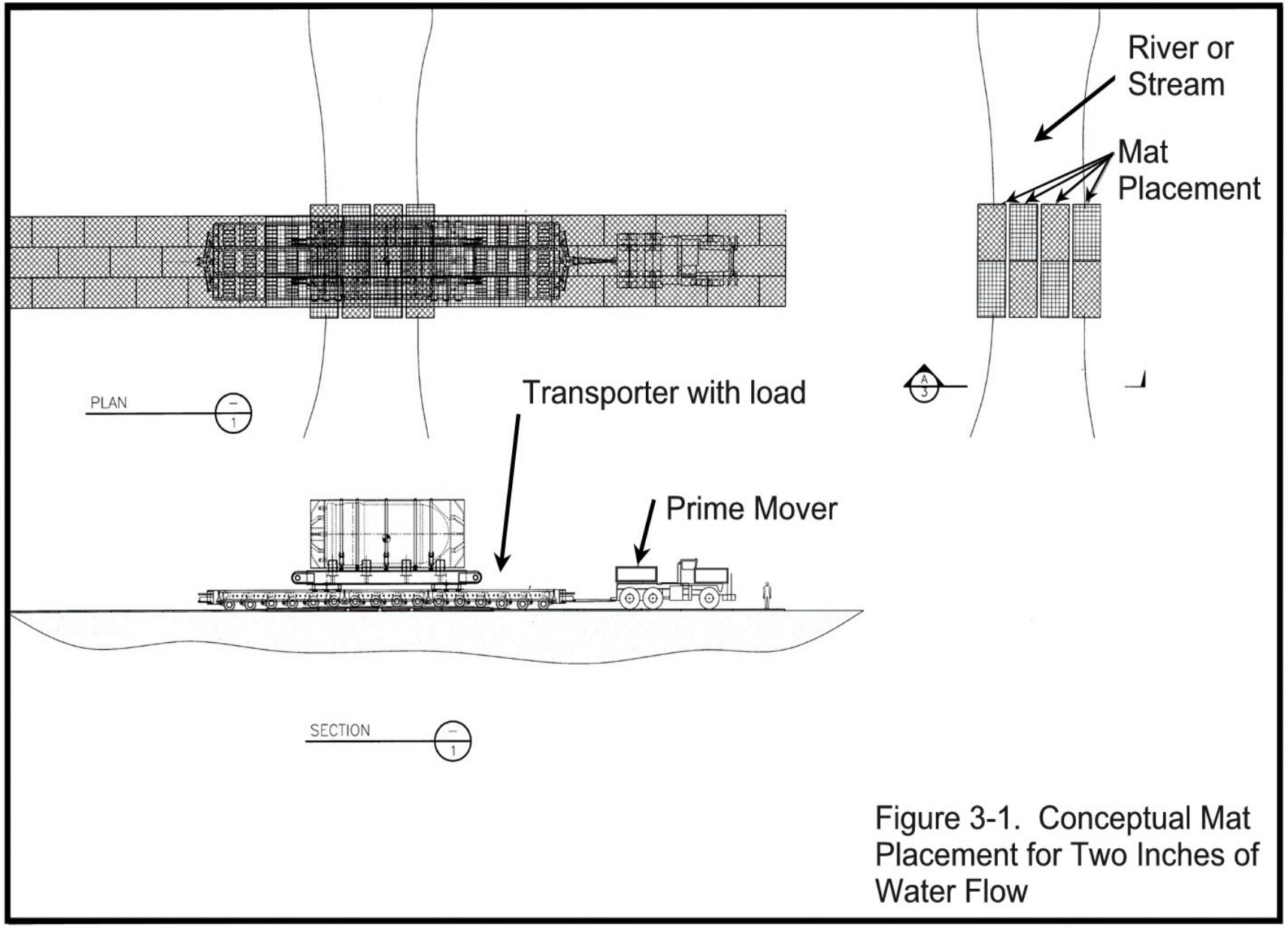


Figure 3-1. Conceptual Mat Placement for Two Inches of Water Flow

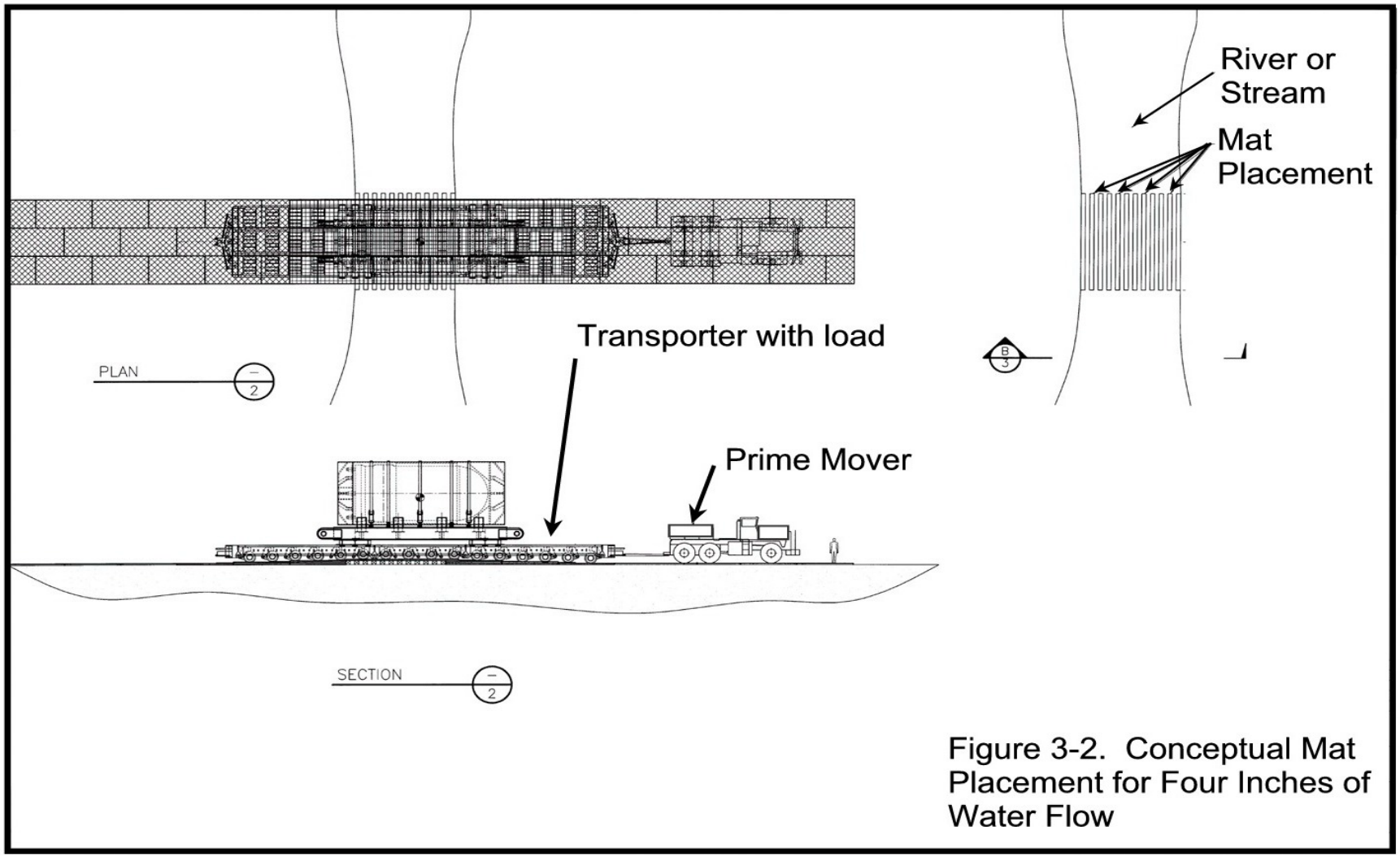


Figure 3-2. Conceptual Mat Placement for Four Inches of Water Flow

placement as was proposed for the transport of the SONGS 1 reactor vessel. Mats will be laid out to approximately 25 feet wide and an appropriate length to form a temporary roadway. The transporter will traverse the mat surface at a very slow rate of speed (approximately four miles per hour [mph] maximum). When the transporter approaches the end of the current section of mats, it may be positioned on a turnout area of mats assembled adjacent to the mat roadway. The crew will move the mats forward to extend the roadway along the transport route. The transport will resume after the mats are "leapfrogged" forward to extend the roadway. Thus, the transportation route along the beach is expected to be less than 30 feet wide, except for the turnout areas, where it will be approximately 60 feet wide. The transporter will stop at nightfall along the beach. The mats may be moved to form the roadway in front of the transporter for the next day during the night. Lighting will be supplied to facilitate night work. The lights will be directed toward the ocean or along the route and away from inland habitat along the beach. A simplified matting configuration is expected to be used on paved roads or firm dirt roads if needed in such areas.

3.1.1.7 Natural Drainage Crossings

The Beach and Road Transport Route passes through several natural drainages, including the Santa Margarita River, along the beach portion of the route. The natural drainages will be crossed using the ford crossing method (EPRI 2002). The ford crossing of each drainage will be accomplished using mats as described above if a wheeled transporter is used and mats are deemed necessary. No matting may be required if a tracked transporter is used. In all cases, crossing natural drainage areas will be accomplished in a manner to cross safely with the load as quickly as possible while minimizing impact on the surface. No permanent bridges or structures will be constructed in or adjacent to waters of the United States that are crossed.

Many of the drainages are expected to be dry during crossing. Thus, no water flow, including potential tidal exchange through a drainage channel, is expected to be present in most of the drainages. In many cases, no distinct drainage channel will be present on the beach at the transit route when the drainages do not have water flow. Crossing of each dry drainage (either over the portion of the beach without a channel or over the potential dry channel) will be accomplished in the same manner as the rest of the beach route.

Water flow may occur in some of the channels. The Santa Margarita River has had water flow to the Pacific Ocean across the beach throughout most of 2002 and 2003, with tidal exchange to the Santa Margarita Estuary. The mouth of the Santa Margarita River at the Pacific Ocean has also been known

to close to tidal exchange, even in winter periods. Therefore, it is unknown whether the Santa Margarita River will have flow during the transport. Most of the other drainages that will be crossed have water flow only during extended rains. Therefore, these other drainages are expected to be dry, but could have water flows to the Pacific Ocean.

Crossings of drainages with flowing water, including the Santa Margarita River, will not occur if the depth of water flow exceeds six inches. Flows of six inches deep or less will be crossed using base mats if deemed necessary to create a ford that allows water to flow under the roadway mats, such as illustrated on Figures 3-1 through 3-2. These figures are specific to the SONGS 1 Reactor Vessel Transport Project but characterize the methods that will be employed for the Project. The exact configuration of this matting may vary; however, it will allow water to flow under the matting without reconfiguring the channel at the crossing location. Flow conditions will be assessed during transport to determine the specific arrangement of mats for each crossing. Crossings will be generally accomplished by temporarily placing several layers of base mats, timbers, or other suitable material across the flowing channel and perpendicular to the direction of the roadway mats. Spaces will be left between the base mats to allow water flow. One or more layers of mats will then be extended in the direction of the roadway mats to span gaps between the base mats, an approach that will allow the transporter to be moved over the respective drainage. All mats will be removed immediately after the crossing has been completed. It should be noted that mats may not be necessary for a ford crossing using a tracked transporter or possibly a wheeled vehicle.

3.1.1.8 Spill Control

The transporter and associated prime mover(s) will not need to be refueled on the beach unless there is an emergency. Other vehicles and equipment using diesel fuel or gasoline will be refueled off the MCBCP. In the event of equipment spills or leaks, including emergency refueling, spill-recovery equipment will be used consistent with the appropriate regulatory spill-prevention guidance and hazardous waste management programs as implemented by the SONGS 2 & 3 Spill Contingency Plan and requirements of MCBCP. Drip pans or other collection devices will be placed under the equipment at night to capture drips or spills. Equipment will be inspected daily for leakage or potential failures.

Portable toilets will be secured to the truck bed during transport. Toilets will be changed, rather than serviced on the beach. The portable toilet vehicle or other vehicles will carry shovels and absorbent materials in the forms of absorbent socks or "pigs," and rags in accordance with the combined

MCBCP-SONGS 2 & 3 Site Spill Prevention Guidance. If used, spent absorbent materials will be collected in plastic bags, as well as contaminated sand or earth. These collected materials will be returned to SONGS 2 & 3, where they will be disposed of in accordance with the SONGS 2 & 3 Site Spill Prevention and Hazardous Waste Programs and requirements of MCBCP.

3.1.1.9 Routine Route Maintenance

For the portion of the transit onto I-5, the fence between the disturbed dirt roads of MCBCP and I-5 will be removed and restored following transit. This will occur for each transport leg of each transport cycle.

3.1.1.10 Layover Stops

The length of matting set up and traversed during daylight hours will determine layovers. The layover locations will not be located in the Santa Margarita River or other drainage areas, or to the immediate west of the Navy Landing Craft Assault Center (LCAC) facility.

Numerous potential stopping areas exist along the route that can be used if needed. Layover stopping areas on the beach portion of the Beach and Road Route Transport Option include those of unvegetated sand above the expected high-tide line. Layover stopping areas on dirt and paved roads may be at a location where required traffic movement by other vehicles will not be impaired.

3.1.2 Inland Route Transport Options

These transport options use a variety of existing roads with some off-road transitions to transport the RSGs to SONGS 2 & 3. These options are on I-5, as well as east and west of I-5 (Appendix A). Travel on I-5 will occur during non-peak hours, as directed by Caltrans, to reduce traffic delays. Non-peak hours are generally expected to be at night; however, specific hours will be determined at a later time in coordination with and at the direction of Caltrans and could include transport at any time during the day. The basic equipment to be used and methods for barge off-loading, transporter loading, and trip numbers for these options are very similar to those described for the Beach and Road Transport Option. Therefore, this section focuses on the descriptions specific to the Inland Transport Options. Two options presented herein cover the range of route segments that may be used. Some other combination of these segments could be used when transport actually occurs. This discussion addresses each of the possible route segments. References to specific types of equipment for each of these options are subject to change; however, the equipment that will ultimately be used is expected to be very similar.

3.1.2.1 I-5/Old Highway 101 Option

3.1.2.1.1 Schedule

The proposed transportation schedule for the portion of the transport on MCBCP is currently expected to begin sometime from October 2008 through February 2009. Each trip will require approximately 10 to 15 days. The unloaded return trips will be at faster speeds and will take less time. Transport of each RSG by a transporter will require overnight layovers along the route through this period except on I-5, where transport will occur during non-peak hours, as directed by Caltrans. The SCE Project Manager will be responsible for all aspects of the transport. The transport will be composed of several activities that will proceed in the following general sequence: pre-transport activity, transport corridor preparation (specific to the vehicles and the surfaces to be crossed), and transport. Although this activity is expected to occur from October 2008 through February 2009, it could occur during the same months in other years depending on vendor supply, operational considerations, and RFO planning needs.

3.1.2.1.2 Barge Unloading and Transport Preparation

This aspect of the transport will be the same as for the Beach and Road Route Transport Option. The various route transitions will require use of several types of transporters.

3.1.2.1.3 Transport Procedure and Route

Specialized transporters will be used to transport the RSGs between the Camp Pendleton Del Mar Boat Basin and SONGS 2 & 3. This approximately 14-mile transport option will occur almost entirely west of I-5 and on I-5 itself, except for a 0.8-mile segment, east of I-5, on Cockleburr and Stuart Mesa Roads. The I-5/Old Highway 101 Option is depicted in Appendix A as segments K and L on MCBCP (Figure A-1), M and N off MCBCP (Figures A-1 and A-2), O through Q on MCBCP (Figures A-2 and A-3), R, S, and F off MCBCP (Figures A-3 through A-5), G and H on MCBCP (Figures A-5 through A-7), and I and J off MCBCP (Figures A-7 through A-9). Several types of transporters may be used, all with similar characteristics to carry the designated load. The specific type of transporter will be determined at a point closer to Proposed Project implementation. The potential range of expected equipment, however, is characterized in the following description. The range of transporters, either a self-propelled or towed system, will use rubber tires. A rubber-tired transporter can either be self-propelled or use one or more

prime movers. In any case, the transporter's size and load capability will be within industry standard design specifications to transport the load over the selected route safely. Generally, current considerations assume that a Caltrans-approved transporter will be used for transport of the RSG on I-5. Other methods of transport operations will be similar to those for the Beach and Road Transport Option.

The RSGs will be offloaded to the transporter from the barge at the Camp Pendleton Del Mar Boat Basin as described in Section 3.1.1.2. The transition from the northeast corner of A Street to the southbound lanes of I-5 may require installation of a temporary on-ramp at this location, which will be removed following transit (segment L on Figure A-1 of Appendix A). The expected requirements may include an approximate 220-foot-long by 50-foot-wide asphalt pathway that could be placed over compacted road base. The existing drainage flows along I-5 will be maintained.

The Santa Margarita River will be crossed using the I-5 bridge and use a special arrangement of transporters and prime movers (segment M on Figure A-2 of Appendix A). A conceptual design of this crossing is provided in Figure 3-3. These transporters, necessary to maintain the structural integrity of the I-5 bridge over the Santa Margarita River, will spread the RSG load over up to four traffic lanes. No other vehicular traffic in the southbound lane of I-5 will be possible. This portion of the transport will also require use of up to eight prime movers, including standbys.

The Cockleburr and Cook Road overpasses (18'-1" and 23'-3" clearances, respectively) are too low to allow continued passage of the steam generators on I-5. To circumvent these two overpasses, a transition may be fabricated onto Coaster Way, the existing rail frontage road. The center divider between the northbound and southbound lanes of I-5 will be temporarily replaced with K-rail and the median may be paved with asphalt (segment N on Figure A-3 of Appendix A). The center divider will be restored following transit. An asphalt pathway may be installed to connect the northbound section of I-5 and Coaster Way. The existing median on the east/west leg of Coaster Way may also be removed temporarily and will be restored following transit.

An asphalt transition road may be installed for the dual-lane transporter to turn from Coaster Way onto Cockleburr Road (segment O on Figure A-3 of Appendix A). The existing guardrail will be temporarily replaced with K-rail and will be restored following transit.

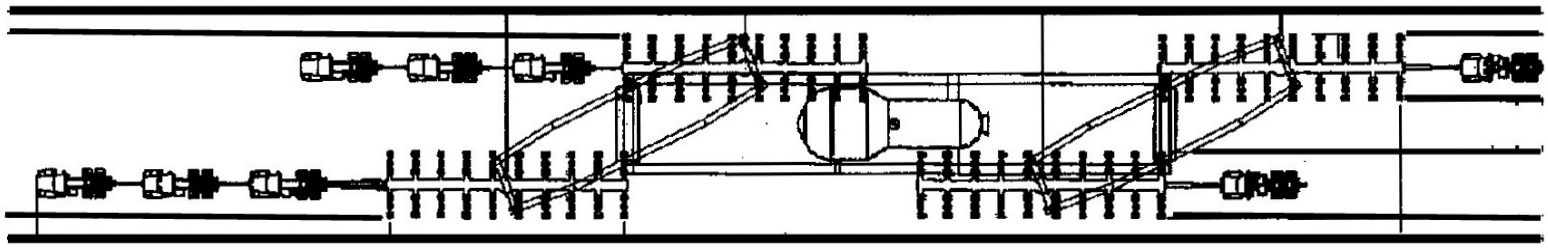


Figure 3-3. Conceptual Drawing of Transport over the Santa Margarita Bridge

Ramps will be used to move the dual-lane transporter over the San Diego Northern Railroad tracks and onto I-5 directly east of the Navy LCAC facility (segments Q and R on Figure A-3 of Appendix A). The existing fence will be removed temporarily and restored following transit, and an asphalt transition possibly installed. The center median rail will be temporarily replaced with K-rail, which will be removed temporarily for each transit and restored following transit. The dual-lane transporter will then travel the I-5 bridge over the Uniform Training Area dirt road and Las Flores Creek (segment S on Figures A-3 through A-5 of Appendix A).

Once the dual lane transporter has progressed north on I-5 past Skull Canyon, the transporter will exit I-5 onto MCBCP just north of Skull Canyon (segment F on Figure A-5 of Appendix A). The rest of this route is identical to the Beach and Road Route Transport Option described in Section 3.1.1.3.

3.1.2.1.4 Other Transport Considerations

The labor force, support activities, refueling, and other aspects of transport will be similar to the Beach and Road Route Transport Option. There will be no direct crossing of natural drainage courses with this option (all crossings will use existing bridges)

3.1.2.1.5 Equipment and Material

The associated heavy transportation and support equipment will be diesel, electric, and/or gasoline-operated. Several types of transporters may be used, all with similar characteristics to carry the designated load. The specific type of transporter will be determined at a point closer to Proposed Project implementation. The potential range of expected equipment, however, is characterized in the following description. Each piece of the following equipment will not be used simultaneously.

3.1.2.1.5.1 Transporter

The transporter is expected to consist of the following or similar equipment:

- Two, 1,500 hp diesel-powered prime movers.
- Up to six 460 hp, diesel-powered prime movers.
- Four 50 HP hydraulic pump motors

3.1.2.1.5.2 Service Fleets

The service fleet is expected to consist of the following or similar equipment:

- Three 400 hp, diesel-powered tractor/transporters to be used as needed to shuttle gear.
- Two diesel-powered, 18-ton forklifts to move and load equipment onto tractor/transporters and trucks as needed.
- Five 1-ton-capacity, diesel-powered tire/utility/mechanic trucks.
- One diesel-powered lifting device to set and remove ramps for barge unloading.
- Up to sixteen gasoline-powered pickup trucks/autos/SUVs for utility, personnel, miscellaneous, and light-duty material transport.
- Three gasoline-powered bucket trucks.
- When needed, approximately six gasoline-powered and six diesel-powered traffic-control vehicles with an associated six trailer-mounted arrow boards.
- Four diesel-powered, 1-ton utility pickups.
- Four 110-volt, gasoline-powered generators and trailer-mounted light towers.

Transportation equipment will be fitted with appropriate mufflers, and all engines will be maintained regularly according to manufacturer specifications. The specific pieces of equipment to be used and their configurations may vary from the above list. This equipment list, however, provides a representative higher range of equipment reasonably expected to be used to assess Project impacts.

Materials that will be transported by truck to the site contain fuel and lubricants, and drinking water. Potential solid waste (e.g., trash) will be properly disposed of in appropriate receptacles. Work crews will use portable chemical toilets.

3.1.2.1.6 Spill Control

In the event of equipment spills or leaks spill-recovery equipment will be used consistent with the appropriate regulatory spill-prevention guidance and hazardous waste management programs as implemented by the SONGS 2 & 3 Spill Contingency Plan and requirements of MCBCP.

Portable toilets will be secured to the truck bed during transport. The portable toilet vehicle or other vehicles will carry shovels and absorbent materials in the forms of absorbent socks or "pigs," and rags in accordance with the combined MCBCP-SONGS 2 & 3 Site Spill Prevention Guidance. If used, spent

absorbent materials will be collected in plastic bags, as well as contaminated sand or earth. These collected materials will be returned to SONGS 2 & 3, where they will be disposed of in accordance with the SONGS 2 & 3 Site Spill Prevention and Hazardous Waste Programs and requirements of MCBCP.

3.1.2.1.7 Routine Route Maintenance

For the portion of the transit onto I-5, the fence between the disturbed dirt roads of MCBCP and I-5 will be removed and restored following transit. This will occur for each transport leg of each transport cycle.

3.1.2.1.8 Layover and Stops

Layover and stops will be provided as necessary. In this case, these areas will be along existing roads in previously disturbed areas.

3.1.2.2 MCBCP Inland Option

Other than the specific route to be followed, this option is similar to the I-5/Old Highway 101 Option. Therefore, aspects of schedule and transport are as described in Sections 3.1.2.1.1, 3.1.2.1.2, and 3.1.2.1.4. The equipment needed for this transport option will also be similar to that needed for the I-5/Old Highway 101 Option. Sections 3.1.2.1.6 and 3.1.2.1.7 of the I-5/Old Highway 101 Option would also be similar to this transport option. This approximately 18-mile transport option will occur east and west of I-5 and on I-5, with most of the route on MCBCP. The MCBCP Inland Option is depicted in Appendix A as segments K, T through W, P, X through AA on MCBCP, and AB through AD and J off MCBCP. The RSGs would be offloaded to the transporter from the barge at the Camp Pendleton Del Mar Boat Basin, as described in Section 3.1.1.2.

The San Diego Northern Railroad and Fallbrook Spur tracks will be crossed using ramps at the Fallbrook Junction Gate. The transporter will travel adjacent to the Fallbrook Spur tracks until the I-5 northbound overpass (segment T on Figure A-1 of Appendix A). The existing Fallbrook Spur tracks in this area will be protected to allow the transporter to travel the center of the path. After the final transit, the protection will be removed.

Movement on MCBCP roadways may require travel only at night or non-peak hours, as directed by MCBCP, to minimize the impact on normal vehicle traffic. MCBCP security will play a role in traffic control and the possibility of detouring conventional traffic on Basilone Road while the steam

generators are in transit. The Stuart Mesa Bridge over the Santa Margarita River has an approximately 220-foot-long and 25-foot-wide roadway (segment W on Figure A-2 of Appendix A). The bridge is constructed of eight bents with an average spacing of 24 feet, each comprising five octagonal piles. Preliminary evaluation indicates that no structural modifications will be necessary. The transporter will continue north on Stuart Mesa Road, interconnected roads, and El Camino Real (segments W, P, X, and Y on Figures A-2 through A-8 of Appendix A).

The transporter will enter I-5 north of the immigration checkpoint facility, which has a paved access road connecting it to El Camino Real (segment Z on Figure A-8 of Appendix A). This road and the checkpoint parking lot adjacent to I-5 can be used to allow the transporter to transition onto I-5 just north of the checkpoint. The guardrail in the center divider will be temporarily replaced with K-rail and restored after transit, and the median may be paved with asphalt temporarily. With these adaptations, the transporter could proceed across the northbound lanes of I-5 with a brief lane closure, then onto the southbound lanes traveling north (segment AA on Figure A-8 of Appendix A). Next, the transport will travel on I-5 to Old Highway 101 (segments AB through AD on Figures A-8 and A-9 of Appendix A). Directly east of the North Road/Old Highway 101 intersection, the transporter will leave the southbound lanes of I-5, possibly using a paved transition (segment AC on Figure A-9 of Appendix A). The transition will lead to ramps that will bridge over the existing San Diego Northern Railroad tracks ballast to a second transition. This transition will accommodate the grade differential between the top of the San Diego Northern Railroad tracks and North Road. The existing island at the intersection will be removed temporarily and the existing storm drain plated over to prevent damage during the transport. The island will be restored and the storm drain plate removed following transit.

The transporter will enter the OCA by either the North or South Access Gates; the entrance gate may require temporary modification to allow the transporter to pass. The transporter will then move within the OCA to the Steam Generator Temporary Staging area.

3.1.3 Other Transport Options Considered but not Carried Forward

Other transportation options alternatives were considered but not carried forward because of their infeasibility or potential for significant environmental impacts. These other transport option alternatives include installation of a barge landing facility at Red, Gold, or Green Beaches. Red and Gold Beaches are too shallow near shore and would require a lengthy pier (i.e., greater than 1,200 feet) to reach a moored

barge or dredging the seafloor for the same distance to construct a barge slip. Green Beach is slightly steeper than the other two beaches; however, it would still require the same type of accommodation to bring in a barge. Green Beach has the additional disadvantage of being adjacent to, and in full view of the active San Onofre State Park, a popular surfing beach. Overall, these beach landing options are expected to have substantial impacts on the marine environment that can be avoided by the proposed action, and they are not practicable options in light of these considerations.

Transporting the units by railroad from the Camp Pendleton Del Mar Boat Basin was considered. A rail spur, however, would need to be built in an area near environmentally sensitive vernal pools east of the Camp Pendleton Del Mar Boat Basin. In addition, the existing through-truss-type rail bridge crossing the Santa Margarita River just north of Oceanside is less than 16 feet wide, too narrow to accommodate the steam generators without bridge replacement. Several railroad overpasses are not high enough to accommodate the expected overall height of the RSGs and railcar. Therefore, rail transport is not practicable considering the magnitude of new bridge and overpass construction and associated environmental impacts. In addition, this is a frequently used transport corridor and this would likely have adverse impacts on the public. Transporting the RSGs from Long Beach Harbor by rail was also considered. The RSGs would have to be transferred at the harbor onto a rail car at the Burlington Northern Santa Fe rail spur. This option was eliminated because the many clearance interferences along the rail route and the weight limitations on San Mateo Rail Bridge would make it infeasible.

Another option considered was transporting the generators from Long Beach Harbor by highways and roads. The excessive weight of the steam generators was an issue on bridges, such as near Dana Point and over San Mateo Creek, neither of which can be easily bypassed. Additionally, the height of the steam generators would require temporary removal and/or raising of a significant number of overhead wires and structures, which makes the transport difficult to manage over the long distance needed to travel. Therefore, this option is infeasible.

Another option considered included transporting the RSGs north along the beach to the mouth of Skull Canyon instead of transitioning to I-5. This option was eliminated because of the extent of compacted fill and grading that would be required at the base of the canyon, and the long duration that it would have to remain in place to accommodate the transport cycles for the RSGs.

3.2 REPLACEMENT STEAM GENERATOR PREPARATION

The Project will use existing SONGS 2 & 3 facilities to the greatest extent practicable. Additional temporary facilities, however, will be required to support the Project. All such facilities will be built according to appropriate codes with full consideration for employee health and safety, as well as utilities and service systems. All temporary facilities will be located on previously developed and/or disturbed areas. Many activities that will be associated with steam generator replacement are already authorized by existing permits and approvals. A list of applicable existing permits is provided in Table 3.2-1.

3.2.1 Steam Generator Staging

The RSGs will be staged onsite on hardwood cribbing or concrete cribbing blocks or other suitable material before their installation in containment during the sequential planned RFO.

Once the RSGs arrive onsite, SCE may stage them outside until ready for installation preparation, at which time SCE will move them into temporary modular or tent-type enclosures for preparatory activities (e.g., preparing nozzles for welding and removing welded caps). Temporary enclosures will be large enough to accommodate the steam generators with adequate space for preparation activities.

3.2.2 Temporary Warehouse and Laydown Area

Temporary warehouse facilities and laydown areas east (i.e., the Mesa) and west of I-5 on disturbed areas will be required. The Mesa is on the east side of I-5, east of the SONGS 2 & 3 OCA (see Figure 1-2). The Mesa area has office buildings, a campground area with approximately 245 spaces used for housing during RFOs, and other supporting facilities. The warehouse and laydown facilities will support activities such as material storage, receiving, and processing.

3.2.3 Personnel Training and Mock-Up Facilities

A training facility will be required to house a steam generator mock-up, which will be used to train personnel in activities such as cutting, templating, machining, welding, and other specialized procedures to be used during original steam generator removal and installation of the RSGs. The existing mock-up facility at the Mesa and/or a temporary mock-up facility will be installed on existing developed and disturbed property within the OCA or on the Mesa side.

Table 3.2-1
Existing SONGS 2 & 3 Permits Applicable to the
Steam Generator Replacement Project

Permit Description	Agency	Permit No.	Permitted Equipment or Activity
Stormwater Permit	San Diego RWQCB	Stormwater Permit 937003198	Concrete Cutting
NPDES Permit	San Diego RWQCB	NPDES Permit Unit2 CA0108073 Unit3 CA0108181	Concrete Cutting
NPDES Permit	San Diego RWQCB, Department of Environmental Health	NPDES Permit Unit2 CA0108073 Unit3 CA0108181	Steam Generator Draining
Health Permit	Department of Environmental Health, Hazardous Materials Program or Mixed Waste Program	Health Permit HO 4692 EPA ID CAD000630921	Tensioning Cable (grease)
Health Permit	Department of Environmental Health, Hazardous Material Program or Mixed Waste Program	Health Permit HO4692 EPA ID CAD000630921	Glass Bead Blasting (rental)
Health Permit	Department of Environmental Health, Hazardous Material Program or Mixed Waste Program	Health Permit HO4692 EPA ID CAD000630921	Asbestos Insulation/Gasket Removal
Health Permit	Department of Environmental Health, Hazardous Material Program or Mixed Waste Program	Health Permit HO4692 EPA ID CAD000630921	Lead/Lead Paint Removal

3.2.4 Fabrication Facility

A temporary facility will be required for welding and shop fabrication activities. The facility, which will be at the Mesa, will be used to prefabricate pipe system components, special tools, electrical make-ups, and to weld piping spool pieces.

3.2.5 Office and Subcontractor Facilities

Temporary steam generator replacement office space will be sized to house both the prime contractor and SCE project team. Office space for approximately 200 people will be required. This facility will be in the OCA to be close to major work activities, which will enable more effective and efficient management of Project work activities. Major subcontractors may also elect to use their own office facility (e.g., trailers) while mobilized at the site. SCE will coordinate the locations of these facilities on existing, developed property.

3.2.6 Containment Access Facility

Provisions will be made for a temporary facility whereby personnel entering the containment building will have direct access. The intent of the facility is to provide an alternate access point for the large number of personnel who will be working on the SGRP to avoid adverse impacts on the normal access facility. The facility, which will be removed upon completion of the RFO, will be in close proximity to the containment buildings on existing, developed land.

3.2.7 In-Processing Facility for Additional Personnel

SCE will provide an additional temporary facility to support in-processing of SGRP personnel. Activities supported by this facility include security background paperwork, site badging, and fingerprinting. SCE will locate this facility within the Mesa, east of I-5.

3.2.8 Parking

Accommodations for up to 1,000 additional personnel onsite will be necessary for the Project, in addition to craft and management support personnel associated with ordinary RFO work (1,000 additional personnel). There is adequate parking space available at the north parking area (Parking Lot 4) and the Mesa. Personnel can then walk to the north security access facility, or use of shuttle buses may be considered. Shuttles that support the additional parking at the Mesa will be provided as necessary.

3.3 ORIGINAL STEAM GENERATOR REMOVAL, STAGING, AND DISPOSAL

Several steps are associated with removal, staging, and disposal of the original steam generators. These steps will be performed in conformance with applicable industry and regulatory standards. Such steps, which may be performed concurrently, consist of the following:

- Reactor fuel movement to the used fuel pool
- Prepare for and create containment opening
- Original steam generator removal
- Original steam generator staging
- Original steam generator disposal

3.3.1 Reactor Fuel Movement

SCE will move the reactor fuel to the used fuel pool. This movement of the reactor fuel is a normal activity performed at each RFO. As with all RFOs at SONGS 2 & 3, this will be done according to procedures developed to comply with industry codes and standards, and NRC regulations and directives.

3.3.2 Prepare for and Create Containment Opening

The SONGS 2 & 3 containment buildings are over 170 feet high with an inside diameter of 150 feet. Each containment building is composed of reinforced concrete walls over four feet thick with an interior steel liner and tensioned with horizontal and vertical tendons. To perform steam generator replacement, an opening approximately 28 feet by 28 feet will be created in the containment building above the existing equipment hatch. The process of creating the opening will include activities such as detensioning and removing tendons, removing concrete, cutting rebar, and cutting and removing a section of the steel liner. Concrete may be cut using hydro-lazing (high pressure water) or other mechanical cutting and chipping removal methods (drilling, sawing, and chipping). The hydro-lazing method uses from 12 to 18, 500 HP diesel driven water pumps each running for a maximum of 200 hours over a 10 to 14 day period to create each containment structure opening. The other mechanical concrete cutting and chipping removal methods are expected to need less diesel drive equipment. Regardless of the concrete removal method chosen, all appropriate permits will be obtained and compliance conditions met. Existing controls and measures used during normal RFOs will be employed to control radioactive materials (solid, liquid, or gas) in accordance with SONGS 2 & 3 programs and procedures. Waste materials, such as oil, grease, concrete, and rebar will be collected and either be recycled or disposed of according to existing SONGS 2 & 3 standard disposal procedures, which conform to appropriate regulatory standards. Upon completion of steam generator replacement, the opening will be sealed and the containment building returned to its original configuration and integrity.

3.3.3 Original Steam Generator Removal

Steam generator replacement will require removal of the two original steam generators per unit. Before the original steam generators are removed from the containment building, they will be drained and cut

away from existing piping and supports. They will be coated to affix loose contamination during the process of removing the steam generators. All openings will be covered or plugged. The original steam generators will be removed through the opening created in the side of the containment buildings.

3.3.4 Original Steam Generator Staging

The original steam generators will be staged at an appropriate location within the OCA upon their removal from containment. The original steam generators will contain low-level radioactive contamination. Radioactive contamination at SONGS 2 & 3 is monitored and controlled according to site procedures and NRC requirements. Appropriate access controls and shielding will be applied as necessary during staging.

3.3.5 Original Steam Generator Disposal

Preparation of the original steam generators for disposal will occur in a temporary enclosure facility. To prepare the original steam generators for shipment, the upper section (e.g., the steam dome and internal components) will be removed from the lower section of the steam generator. The steam dome will be cut up to reduce the volume of waste, and placed in shipping containers for shipment to a licensed LLRW disposal facility. The lower section of the steam generator will also be transported to a licensed LLRW disposal facility. These upper and lower pieces will be transported for disposal according to Department of Transportation (DOT), NRC, and SONGS 2 & 3 transportation and disposal procedures.

3.4 REPLACEMENT STEAM GENERATOR INSTALLATION AND RETURN TO SERVICE

Major activities, such as creation of the containment opening in order to install the RSGs, will have already occurred for removal of the original steam generators. After placement of the RSG into the location vacated by the original steam generator, SCE will align the RSG, install supports, and fit-up and weld connecting piping. Finally, SCE will remove temporary structures, return the containment building to its original configuration and integrity, and perform return to service testing. Although not specifically part of this project, an Integrated Leak Rate Test (ILRT) will be conducted after the containment structure has been sealed at the completion of the RSG installation. The ILRT is a routine NRC license requirement that is to be done on an approximate ten-year frequency. Regardless of the steam generator replacement activity, the ILRT will be conducted. The last ILRT was conducted in

1995. The next routine ILRT will be due during an RFO closest to 2005. However, this test date, with the concurrence of the NRC, will be extended to the Cycle 16 RFO. Such an extension is not expected to be withheld by the NRC.

3.5 NO PROJECT ALTERNATIVE

Two types of no project alternatives are considered in this report. "No Project" basically means that the original steam generators are not replaced and SONGS 2 & 3 will no longer be available for service, resulting in the loss of approximately 2,150 MW of base load system generation capacity. For this document, the No Project Alternative evaluates construction of new transmission facilities, including transmission lines, installation of other transmission system enhancements at existing facilities, and construction of new generation capacity to meet system needs to replace the power were SONGS 2 & 3 to cease operations. The exact configuration of this No Project Alternative would vary depending upon a number of factors beyond SCE's control. These facilities would be subject to a separate permitting process that would have to be completed in the future. This section describes reasonable alternatives that would satisfy the need for replacement facilities in a cost-effective manner and allow a conceptual level of assessment of impacts for this report. The second type of no project alternative, which assumes that no action would be taken to replace the electrical capacity of SONGS 2 & 3, is referred to in this report as No Action. The No Action Alternative is described in Section 3.6.

The following text considers two components of the No Project Alternative. The first component is new generation, and the second is new transmission. There are three alternatives for transmission, which are described below. These alternatives were developed based on SCE's most recently filed resource plan.

3.5.1 Replacement Facilities – New Generation Component

SONGS 2 & 3 is a base-loaded facility that operates at approximately an 88% annual capacity factor. Based on this factor, it is assumed that new replacement power for SONGS 2 & 3 would be from several combined cycle gas turbine (CCGT) plants. Natural gas-fired CCGT plants are designed to operate efficiently at base-load conditions with acceptable low rates of air emissions, which is considered the best-case option to replace SONGS 2 & 3 generation. The estimated loss that must be replaced at SONGS 2 & 3 is 2,150 MW (net).

A typical configuration for a proven modern CCGT plant is a two-on-one design (two gas turbines and one steam turbine with associated heat-recovery steam generators and duct burners). It is further assumed that the gas turbines would be "F"-class machines matched with an appropriate size steam turbine to produce approximately 500-plus MW (gross) of electrical generation. An appropriate amount of gas fuel duct firing is also assumed to be provided to augment maximum power production to make up for losses associated with ambient worst-case temperature conditions.

The exact site of the new replacement CCGT generation facilities is currently unknown but can reasonably be assumed to be divided between southern California and Arizona. Transmission impacts were analyzed (SCE-5) assuming approximately 895 MW located in the SCE and San Diego Gas & Electric (SDG&E) service territory, and approximately 1,255 MW imported from Arizona's Palo Verde region. The addition of this new generation will increase the demand for natural gas. According to a gas price market study (referenced in SCE-4), increased gas demand associated with replacing SONGS 2 & 3 would likely raise natural gas prices statewide.

The ultimate site and authorization to construct and operate the replacement CCGT facilities will be subject to separate environmental impact analyses and final approval processes by various local, states of California and Arizona, and/or Federal agencies. As such, the Project does not address such environmental impacts except to characterize generally the environmental consequences of adding SONGS 2 & 3 replacement generation as a consideration of this Project.

3.5.2 Replacement Facilities – New Transmission Component

Transmission alternatives and associated costs studies were prepared by SCE and are presented as Exhibit SCE-1 and SCE-5. Transmission system modeling was used to determine the potential effects on transmission system performance resulting from removal of SONGS 2 & 3 (2,150 MW) from the transmission grid. The system performance benchmarks used in these studies were the North American Electricity Reliability Council and Western Electricity Coordinating Council (WECC) Planning Standards (WECC 2003).

Model In-Service Assumptions

The system scenario modeled for this transmission analysis was future year 2010, heavy summer load, with imports to southern California relatively heavier from Arizona, versus Pacific Gas & Electric and the

Pacific Northwest. SCE's modeled loads and system resources were adjusted to be consistent with assumptions used for SCE transmission and interconnect planning studies. SDG&E's Transmission Planning department provided information that SCE used to modify modeling of SDG&E's loads, system resources, and electrical network. In addition to adjustments to SCE and SDG&E loads and resources, the transmission model incorporated several key network additions and modifications to create a future-year network scenario appropriate for the study year, 2010. These transmission network model modifications, assumed to be in service in 2010, included the following:

- Add Devers-Palo Verde No. 2 500-kilovolt (kV) transmission line (DPV2 Project).
- Add Devers No. 2 500/230 kV transformer (West of Devers Upgrades).
- Upgrade Devers-Palo Verde 500 kV, Hassayampa -N. Gila, and N.Gila - Imperial Valley 500 kV series capacitors (Path 49 Upgrade Project).
- Upgrade Imperial Valley-Miguel 500 kV series capacitors.
- Add Miguel-Mission No. 2 - 230 kV line.
- Upgrade the 230 kV lines west of Devers Substation to bundled 2B-1033 ACSR conductor (West of Devers Upgrades).
- Add 388 megavar (MVAR) static var compensators (SVCs) (one each) at SCE's Devers and Valley Substations (DPV2 Project).
- Add Miguel No. 2 500/230 kV transformer.

New SONGS 2 & 3 Shutdown Transmission and Substation Assumptions

As described in Exhibit SCE-5, transmission network modifications required to mitigate the effects of SONGS 2 & 3 shutdown on the transmission grid include the following new transmission and substation upgrades. There are three potential new transmission and substation upgrades projects considered in this conceptual assessment. Each of these projects can satisfy system needs in combination with the proposed new generation component. They are the Reinforced 230 kV SCE/SDG&E Interface Project discussed in Section 3.5.2.1, the Imperial Valley-Ramona Project discussed in Section 3.5.2.2, and the Valley-Rainbow Project discussed in Section 3.5.2.3. The general

area of new transmission and substation upgrades is depicted on Figure 3-4 and the existing substations on Figures 3-5 through 3-15.

3.5.2.1 Reinforced 230 kV SCE/SDG&E Interface Project

This No Project Alternative would include the upgrade (reconductoring) of the existing 13-mile 230 kV Barre-Ellis transmission line, the upgrade of several other tower system for transmission lines that share this transmission corridor, as well as the addition of 2,520 MVAR of SVC devices at various existing substations. The existing Switchward at SONGS would also require an upgrade.

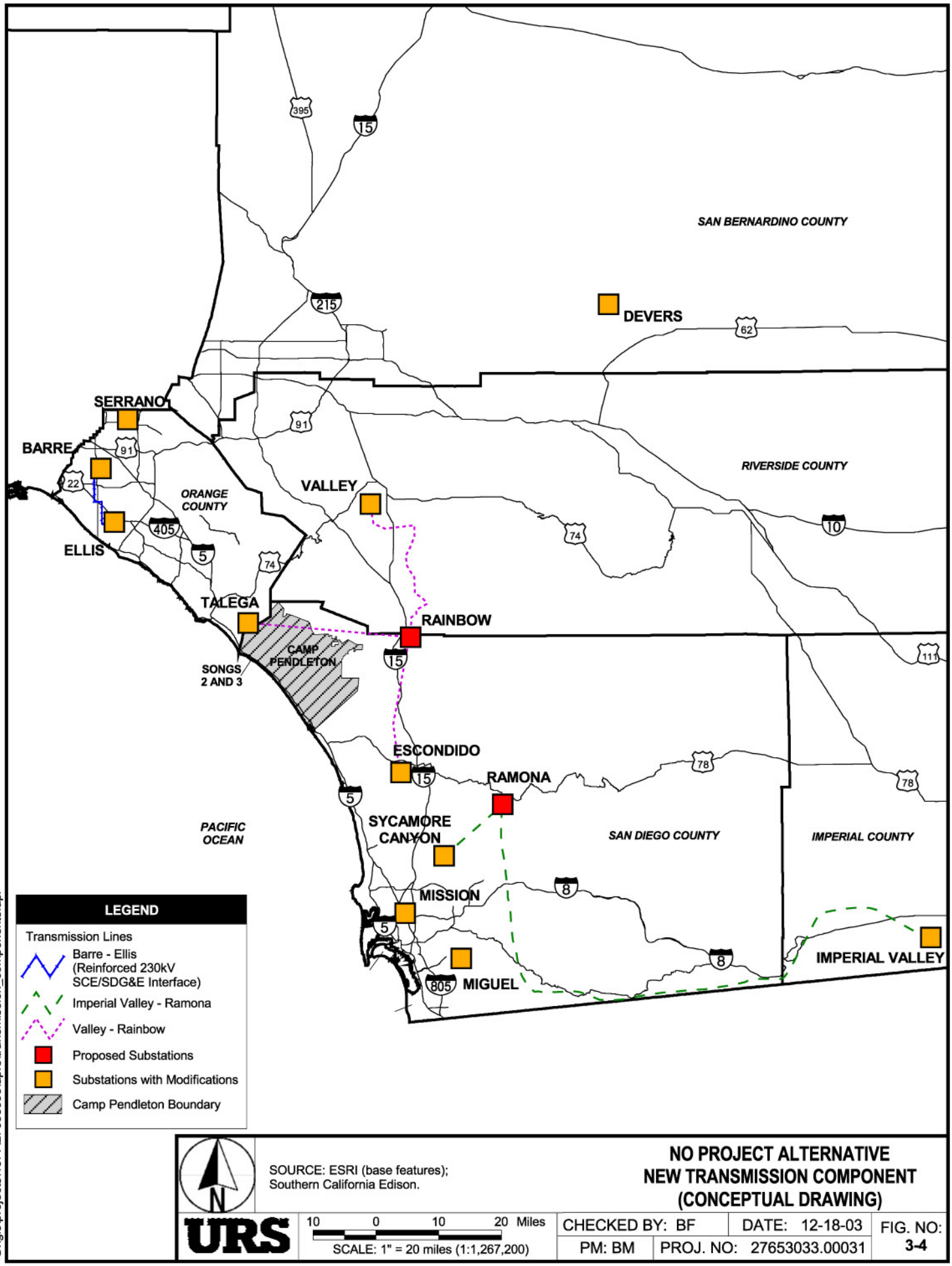
Conclusions and opinions related to improvements that would be part of the Reinforced 230 kV SCE/SDG&E Interface Project and expressed herein may differ from actual impacts because a more detailed analysis would be performed if a specific project were to be implemented at some future time.

The following list includes the specific transmission and substation upgrades included as part of the Reinforced 230 kV SCE/SDG&E Interface No Project Alternative:

- Reconductor and modify towers on the Barre-Ellis 230 kV transmission line.
- Modify towers on the Delamo-Ellis 230 kV transmission line (within the Barre-Ellis corridor).
- 200 MVAR SVC at Talega 138 kV Substation.
- 360 MVAR SVC at Imperial Valley 500 kV Substation.
- 280 MVAR SVC at Valley 500 kV Substation.
- 480 MVAR SVC at Devers 500 kV Substation.
- 1,200 MVAR SVC at Serrano 500 kV Substation.

3.5.2.2 Imperial Valley – Ramona Project

Approximately 63 miles of new 500 kV transmission line from the existing Imperial Valley Substation to the east, would be adjacent to the existing Imperial Valley-Miguel 500 kV transmission line, as well as approximately 41 miles of new transmission line along a new route extending north to a new 500 kV Ramona Substation. In addition, approximately 16 miles of a new double circuit 230 kV transmission line from the new Ramona Substation to the existing Sycamore Canyon Substation would be adjacent to an existing 69 kV transmission line, and a less than one-


SAN BERNARDINO COUNTY
DEVERS
SERRANO
BARRE
ELLIS
ORANGE COUNTY
VALLEY
RIVERSIDE COUNTY
TALEGA
SONGS 2 AND 3
CAMP PENDLETON
RAINBOW
ESCONDIDO
RAMONA
SYCAMORE CANYON
PACIFIC OCEAN
SAN DIEGO COUNTY
IMPERIAL COUNTY
MISSION
MIGUEL
IMPERIAL VALLEY
LEGEND
Transmission Lines
Barre - Ellis (Reinforced 230kV SCE/SDG&E Interface)
Imperial Valley - Ramona
Valley - Rainbow
Proposed Substations
Substations with Modifications
Camp Pendleton Boundary
N
SOURCE: ESRI (base features); Southern California Edison.
10 0 10 20 Miles
SCALE: 1" = 20 miles (1:1,267,200)
URS
NO PROJECT ALTERNATIVE
NEW TRANSMISSION COMPONENT
(CONCEPTUAL DRAWING)
CHECKED BY: BF
DATE: 12-18-03
PM: BM
PROJ. NO: 27653033.00031
FIG. NO: 3-4
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SOURCE: SCE

EXISTING BARRE SUBSTATION
NO PROJECT ALTERNATIVE: NEW TRANSMISSION COMPONENT

URS

NO SCALE

CHECKED BY: BF	DATE: 12-18-03	FIG. NO: 3-5
PM: BM	PROJ. NO: 27653033.00031	

G:\gis\projects\1577\27653033\aprs\barre.apr

SOURCE: SCE

EXISTING ELLIS SUBSTATION
NO PROJECT ALTERNATIVE: NEW TRANSMISSION COMPONENT

URS

NO SCALE

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PM: BM	PROJ. NO: 27653033.00031	

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EXISTING TALEGA SUBSTATION
NO PROJECT ALTERNATIVE: NEW TRANSMISSION COMPONENT

URS	NO SCALE	CHECKED BY: BF	DATE: 12-18-03	FIG. NO: 3-7
		PM: BM	PROJ. NO: 27653033.00031	

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EXISTING IMPERIAL VALLEY SUBSTATION
NO PROJECT ALTERNATIVE: NEW TRANSMISSION COMPONENT

URS	NO SCALE	CHECKED BY: BF	DATE: 12-18-03	FIG. NO: 3-8
		PM: BM	PROJ. NO: 27653033.00031	

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SOURCE: Globe Explorer, Airphoto USA 2003

EXISTING VALLEY SUBSTATION
NO PROJECT ALTERNATIVE: NEW TRANSMISSION COMPONENT

URS

NO SCALE

CHECKED BY: BF	DATE: 12-18-03	FIG. NO: 3-9
PM: BM	PROJ. NO: 27653033.00031	

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SOURCE: Globe Explorer, Airphoto USA 2003

EXISTING DEVERS SUBSTATION
NO PROJECT ALTERNATIVE: NEW TRANSMISSION COMPONENT

URS	NO SCALE	CHECKED BY: BF	DATE: 12-18-03	FIG. NO: 3-10
		PM: BM	PROJ. NO: 27653033.00031	

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SOURCE: Globe Explorer, Airphoto USA 2003

EXISTING SERRANO SUBSTATION
NO PROJECT ALTERNATIVE: NEW TRANSMISSION COMPONENT

URS

NO SCALE

CHECKED BY: BF	DATE: 12-18-03	FIG. NO: 3-11
PM: BM	PROJ. NO: 27653033.00031	

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SOURCE: Globe Explorer, Airphoto USA 2003

EXISTING MIGUEL SUBSTATION
NO PROJECT ALTERNATIVE: NEW TRANSMISSION COMPONENT

URS

NO SCALE

CHECKED BY: BF	DATE: 12-18-03	FIG. NO: 3-12
PM: BM	PROJ. NO: 27653033.00031	

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SOURCE: Globe Explorer, Airphoto USA 2003

EXISTING SYCAMORE CANYON SUBSTATION
NO PROJECT ALTERNATIVE: NEW TRANSMISSION COMPONENT

URS

NO SCALE

CHECKED BY: BF	DATE: 12-18-03	FIG. NO: 3-13
PM: BM	PROJ. NO: 27653033.00031	

G:\gis\projects\1577\27653033\aprs\sycamore.apr

SOURCE: AirPhoto USA
(March 2002 aerial).

EXISTING ESCONDIDO SUBSTATION
NO PROJECT ALTERNATIVE: NEW TRANSMISSION COMPONENT

URS

100 0 100 200 Feet
SCALE: 1" = 100' (1:1200)

CHECKED BY: BF	DATE: 12-18-03	FIG. NO: 3-14
PM: BM	PROJ. NO: 27653033.00031	

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SOURCE: Globe Explorer, Airphoto USA 2003

EXISTING MISSION SUBSTATION
NO PROJECT ALTERNATIVE: NEW TRANSMISSION COMPONENT

URS

NO SCALE

CHECKED BY: BF	DATE: 12-18-03	FIG. NO: 3-15
PM: BM	PROJ. NO: 27653033.00031	

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mile loop into the existing Sycamore Canyon Substation from the existing Chicarita-Carlton Hill 138 kV transmission line would be constructed.

Conclusions and opinions related to improvements that would be part of the Imperial Valley-Ramona Project and expressed herein may differ from actual impacts because a more detailed analysis would be performed if a specific project were to be implemented at some future time.

The following list includes the specific transmission and substation upgrades included as part of the Imperial Valley-Ramona Project, No Project Alternative:

1. Imperial Valley-Ramona Project

   - New Imperial Valley-Ramona 500 kV line, single circuit, approximately 104 miles long.
   - New Ramona-Sycamore Canyon Nos. One and Two, 230 kV line, double circuit, 16 miles long.
   - Loop the existing Chicarita-Carlton Hill 138 kV line into Sycamore Canyon (loop in and out of the Sycamore Canyon Substation, adjacent to this corridor).
   - New 500 kV Ramona Substation 16 circuit miles northeast of the existing Sycamore Canyon Substation (new substation will include one 500/230 kV transformer).
   - Add a 230/138 kV transformer and 138 kV bus work at existing Sycamore Canyon Substation for termination of the new 138 kV looped-in line sections.
   - Add 1,374 MVAR of SVC devices at various existing substations as indicated below.
     - 500 MVAR SVC at Imperial Valley 500 kV Substation.
     - 50 MVAR SVC at Talega Substation 138 kV Substation.
     - 112 MVAR SVC at Valley Substation 500 kV Substation.
     - 212 MVAR SVC at Devers Substation 500 kV Substation.
     - 300 MVAR SVC at Serrano 500 kV Substation.
     - 200 MVAR SVC at proposed Ramona 500 kV Substation.

3.5.2.3 Valley - Rainbow Project

A PEA for the Valley-Rainbow Interconnect Project was previously prepared and submitted by SDG&E to the CPUC on March 23, 2001, and this document describes a likely and similar scenario with respect to the new transmission line (described below), plus associated improvements, and is incorporated herein by reference. Readers should note that a new Valley-Rainbow Transmission Line and new Rainbow Substation would likely differ from those described in the Valley-Rainbow Interconnect PEA, although their descriptions serve the conceptual purposes of this assessment. Conclusions and opinions included herein by reference from the SDG&E Valley-Rainbow Interconnect Project appear feasible; however, SCE and URS Corporation (URS) have not evaluated these conclusions and opinions to a level of detail sufficient to either confirm or deny them. Therefore, conclusions and opinions by either SCE or URS for a new Valley-Rainbow Transmission Line, new Rainbow Substation, or other new facilities for the No Project Alternative may differ from the conclusions in the Valley-Rainbow Interconnect PEA if a specific new project were proposed at some future time.

The following list includes the specific transmission and substation upgrades included as part of the Valley-Rainbow Project for the No Project Alternative:

1. Valley-Rainbow Project:

   - New Valley-Rainbow 500 kV line, approximately 30 miles long.
   - New Rainbow 500/230 kV transformer, 1120 MVA.
   - Loop in existing Talega-Escondido 230 kV line into the new Rainbow Substation, forming Talega-Rainbow No. One 230 kV line and Escondido-Rainbow No. One 230 kV line.
   - New 230 kV Talega-Rainbow No. 2 230 kV (second circuit on existing structures).
   - New 230 kV Escondido-Rainbow No. 2 230 kV (second circuit on existing structures).
   - New 300 MVAR UPFC (unified power flow controller) device at the new Rainbow 500 kV Substation.
   - New 200 MVAR SVC at Mission 230 kV Substation.
   - New 63 MVAR switched capacitor at Miguel 230 kV Substation.
   - New 126 MVAR switched capacitor at Sycamore Canyon 230 kV Substation.

2. Addition to the Valley-Rainbow 500 kV line project scope:

- Add a second new Rainbow 500/230 kV, 1120 MVA transformer.

3. Add 924 MVAR of SVC devices at various existing substations listed below.

- 100 MVAR SVC at Talega 138 kV Substation.
- 212 MVAR SVC at Valley 500 kV Substation.
- 412 MVAR SVC at Devers 500 kV Substation.
- 200 MVAR SVC at Serrano 500 kV Substation.

3.6 NO ACTION ALTERNATIVE

The No Action Alternative assumes that no action would be taken to replace the electrical capacity of SONGS 2 & 3. If no action were taken, this would result in severe degradation of transmission system performance under certain conditions (potential voltage collapse for N-1, loss of single transmission component), as described in Exhibit SCE-1 and SCE-5. If there is severe transmission system voltage instability there could be blackouts and other service reductions resulting in customer load being dropped and not served. This violates Western Electricity and Coordinating Council, California Independent System Operator, and SCE Transmission Planning criteria. This No Action Alternative is not a viable alternative to the Proposed Project. It is not analyzed further in this PEA because it would lead to significant impacts on public health and safety, California's economy, and the environment if implemented. This alternative is not considered likely or an appropriate alternative because of the magnitude of the impacts from loss of power supply that would result from it. Furthermore, it is unlikely that SONGS 2 & 3 power generation would cease without some form of replacement power being supplied to avoid impacts associated with potential loss of service that could otherwise occur. SCE would also no longer be in compliance with CPUC requirements (Public Utilities Code, Section 451) for SCE's electric system. Therefore, this alternative is not practicable and not carried forward in sections assessing the impacts of individual alternatives.

3.7 OTHER ALTERNATIVES CONSIDERED BUT NOT CARRIED FORWARD

The Project consists of replacement of four primary pieces of equipment (i.e., the steam generators) at SONGS 2 & 3. Once the RSGs are transported to SONGS 2 & 3, replacement activities will be in compliance with existing site programs. Therefore, the primary alternatives to the Project consist of alternative routes to transport the RSGs to SONGS 2 & 3. SCE has identified feasible transport options

and is currently considering the use of any of these transport options, as discussed in Section 3.1. Alternative transport options considered infeasible, and therefore rejected, are discussed in Section 3.1.3.

Alternatives to the overall Project all involve some consideration of either new generation and new transmission, respectively, or potential loss of power as described in the No Project and No Action alternatives (Sections 3.5 and 3.6). Different combinations of new generation and new transmission than those described in Section 3.5 may be possible; however, they would all be subject to separate and complete permitting processes. Many such potential different combinations may not meet SCE's required obligations to supply power in a cost-effective manner. Therefore, such combinations are either infeasible based on their cost-effectiveness or are potentially too numerous to define in light of the purpose and need for the Project. The No Project Alternative described in Section 3.5, including new generation and new transmission, is the least-cost, most feasible no project alternative conceptually for this environmental review process. Other potential alternatives are higher-cost or infeasible, and were rejected from further consideration in this document.