CALIFORNIA COASTAL COMMISSION
45 FREMONT STREET, SUITE 2000
SAN FRANCISCO, CA 94105-2219
VOICE: (415) 904-5200
FAX: (415) 904-5400
TDD: (415) 597-5885

W20a

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APPENDIX B:

FEIR DESCRIPTION OF DECONTAMINATION AND DISMANTLEMENT ACTIVITIES

equipment and truck volume may require roads and parking lots to be repaired or maintained and access to be modified. Access road improvements or reconfigurations would occur only in disturbed areas. All security features would remain.

Proposed Project upgrades to the existing rail spur, rail staging, switching equipment, and signals may also occur to streamline waste transport by rail. The rail spur provides access to the Onshore Site from the main rail line next to SONGS' east side. If it cannot accommodate the planned volume of D&D shipping activity it would need to be upgraded to stage empty and loaded rail cars. The Proposed Project anticipates: an estimated 0.5 to 1.0 mile of new rail improvements within existing developed areas; modification of the existing rail alignment near the Administrative, Warehouse, and Shops Building; installation of a new switch on two existing spurs on the east side of the Fuel Building to stage railcars (SCE 2017b); and changes to the site's rail entrance point (Figure 2-4).

2.3.1.4 Temporary Power Supply and Utilities and Equipment Preparation

DGC D&D preparatory activities related to power supply, utilities, and equipment use may require the items below (see Section 2.3.10~~3~~, *Water Use and Power Supply*).

Power Supply and Utility Preparation

- Temporary lighting and power
- High-efficiency particulate air ventilation systems
- Temporary, portable water treatment systems
- Portable sanitary facilities
- Potable water distribution
- Communication infrastructure
- Temporary fire suppression

Equipment Preparation

- Cranes (lattice boom, knuckle boom)
- Material handling devices
- Temporary lifting devices
- Temporary office facilities
- Concrete reduction (crushing) equipment

2.3.2 Decontamination and Dismantlement

Proposed Project activities include dismantling and segmenting Containment Building internals, removing Containment Buildings, removing or decontaminating radiologically contaminated SSCs to achieve NRC release criteria, and removing some non-contaminated SSCs and other infrastructure not required for the Approved ISFSI or switchyard. Typical methods for each activity, based on industry standards and common best practices, are described below (the DGC would propose specific work methods).

2.3.2.1 General Approach to System and Component Removal

Before site buildings are demolished, each building or structure (whether contaminated or non-contaminated) would be prepared by clearing selected interior SSCs. The initial Site Characterization Report (AREVA 2015a) identifying hazards and contaminants would be used to guide the DGC's initial D&D activities and would be supplemented by ongoing site characterization throughout the D&D process. At the end of the Proposed Project, the DGC would prepare a Final Site Characterization Report.

Controlling the spread of radioactive or other hazardous materials during SSC removal is accomplished using industry standard control methods based on the degree of contamination. A typical approach is to isolate the immediate work area from other areas, control access into that area, and cover or apply a protective coating or fixative (referred to as "lockdown" and typically a polymer-based latex paint) to lock down contamination once an SSC is removed from its installed location. Several SSC dismantlement and removal examples are provided below.

- For a building or other structure containing SSCs with high levels of radioactivity, these SSCs would be dismantled and removed while the structure is intact (i.e., before structure demolition), as appropriate. The structure provides a confinement to prevent the release of radioactive materials to the environment.
- Where minimally contaminated or non-contaminated systems are present (e.g., in the Turbine Building), SSCs may be removed during structure demolition. Heavy equipment would demolish the SSCs into a large rubble pile, with the material then segregated by types or waste stream, as required.
- In a structure with both hazardous and non-hazardous SSCs, contaminated SSCs would be removed. Remaining non-hazardous SSCs would be removed during structure demolition using heavy equipment, as appropriate.
- Non-hazardous SSCs would be sorted or segregated as required for disposal as part of particular waste streams.

Any SSCs that remain below grade would be backfilled, grouted, plugged, or filled with concrete (SCE 2016a – DR #1-5) <u>or similar material,</u> so as not to create a void space over time after the area is backfilled. <u>Similar materials to achieve the dense structure of concrete could include a low density flowable fill or cellular concrete material (tradename Elastizell). It is similar to concrete in that it is cementitious (mostly cement and water). It differs from normal concrete in that admixtures and equipment are used to entrain significant amounts of air, which results in a much lower density. This material has sufficient strength to meet engineered fill requirements and it does not pose a hazard to the environment (SCE 2018l).</u> Most SSCs would be removed from within structures (see Section 2.3.4, *Other Structures Systems and Components: Removal Methods*). Local suppliers would provide soil and slurry backfill, if needed; a concrete batch plant would not be installed on-site (SCE 2017b).

2.3.2.2 General Approach to Decontamination

The Proposed Project includes decontamination of SSCs to meet NRC radiological remediation requirements. The DGC would implement a Radiological Protection Program (see Table 2-5) in accordance with NRC regulations (e.g., see 10 CFR Part 20.1003) that require radiation exposures be maintained in accordance with ALARA (As Low As Reasonably Achievable) (SCE 2017b). General approaches to decontamination are: (1) complete removal of the component or structure, (2) surface decontamination, or (3) a combination of both approaches. All these approaches segregate waste streams to meet disposal requirements. Ultimately, all above-grade SSCs would be removed, but surface decontamination may first be used to reduce overall volume of radioactive waste.

All on-site waste handling operations would comply with approved radiation and waste-handling procedures and applicable hazardous and radiological safety regulations. Established procedures could include the use of: a protected laydown area for removing and staging large pieces of contaminated concrete outside; fixative material or plastic wrapping for moving contaminated items, such as large pieces of concrete in open air; and waste containers for smaller pieces. Multiple temporary containment enclosures would likely be installed to allow for demolition and loading/unloading of materials before moving to the truck or rail conveyance for shipment. These temporary enclosures would not exceed the height of the containment domes.

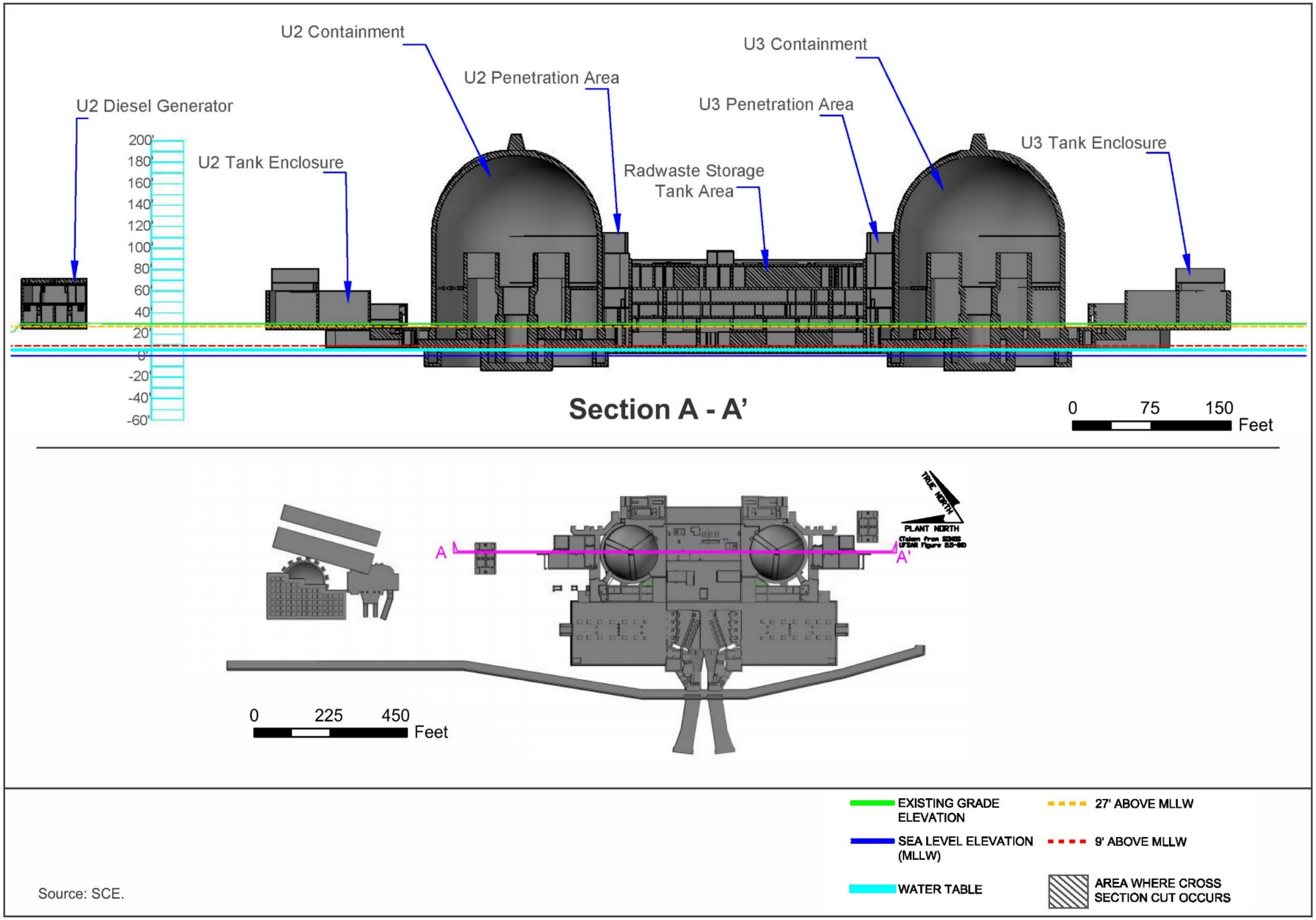
As shown in Figures 2-5 and 2-6, the SONGS protected area (PA) includes below-grade SSCs. Based on industry experience, decontamination work would include removal of all structures to a minimum of approximately 3 feet below existing local grade (to 27 feet Mean Lower Low Water [MLLW] in the PA). Certain structures may require removal to approximately 21 feet below local grade (to 9 feet MLLW in the PA) or, in limited cases, more, based on the following considerations:

- The extent needed to meet regulatory radiological/hazardous material limits
- The ability to safely access SSCs requiring D&D
- The ability to safely perform Final Status Surveys (FSSs) on the SSCs
- Whether abandoning the SSCs in place would create a substantial void

If a surface decontamination approach is used, the extent of the effort is informed by the site characterization for that area. Typically, the contaminated top surface of the concrete is removed to meet pre-established open-air demolition criteria, leaving contamination-free walls, ceilings, and floors to be demolished as a typical industrial structure. Surfaces can be decontaminated using a variety of techniques and equipment selected based on safety, the extent of contamination, and effectiveness of the decontamination technique. Some examples of industry standard decontamination techniques are listed below.

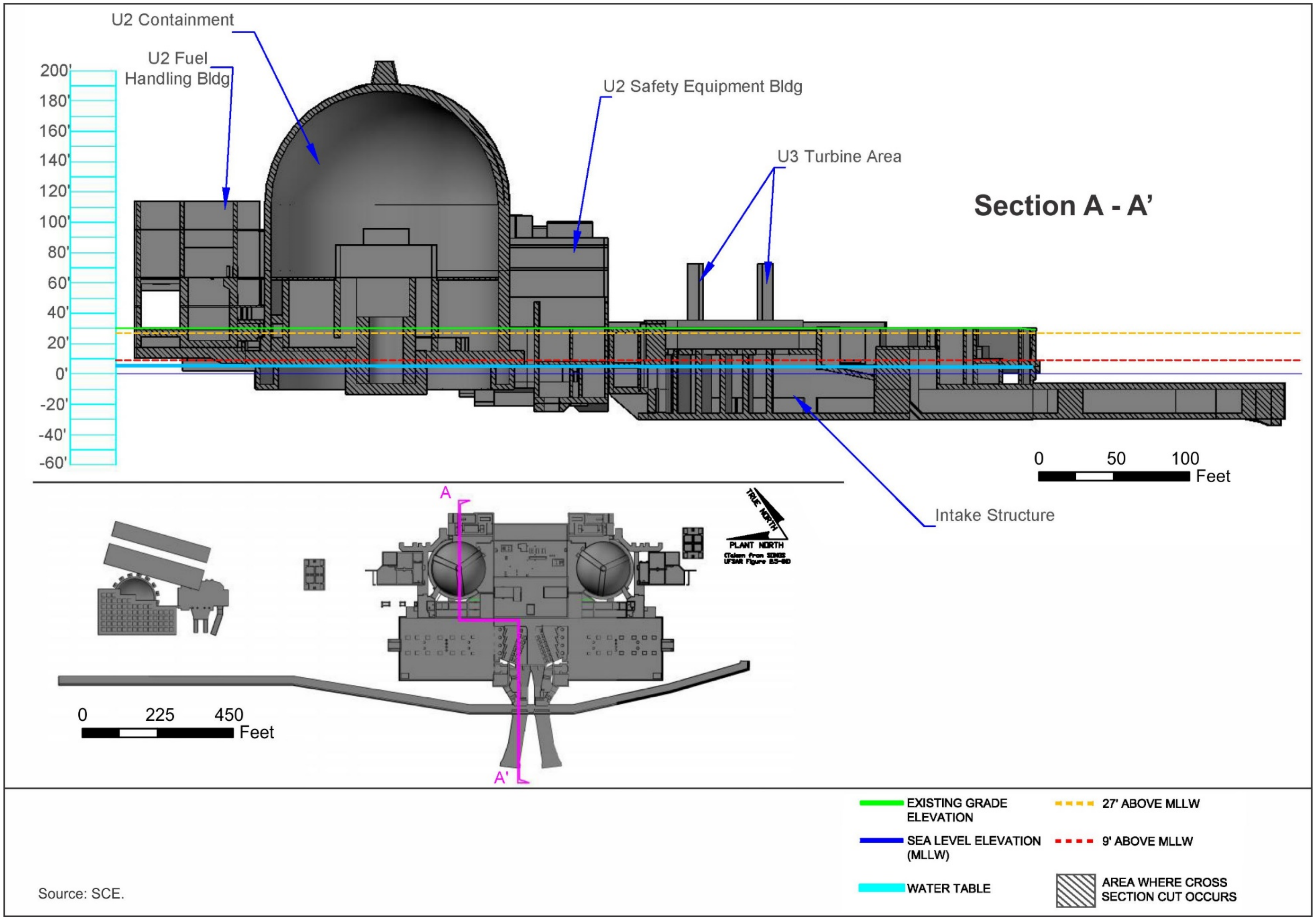
- **Concrete Scabbling** is a common, relatively quick method that can generally remove the first 0.25 inch of contamination on exposed concrete surfaces. Scabbling equipment uses pneumatic pistons to break the concrete surface. It is noisy and creates dust, but usually has built in systems to collect dust and debris.

Figure 2-5. SONGS Units 2 and 3 Cross Section (North to South)



Source: SCE.

Figure 2-6. SONGS Units 2 and 3 Cross Section (East to West)



Source: SCE.

- **Concrete Shaving** is another frequently used method to remove exposed surfaces of concrete or surface coating/paints. Shaving of floors, ceilings, and walls is commonly used during minor decontamination or paint removal. Shavers are noisy and generate dust but often have built-in vacuum units that attach to the final disposal drums and filter exiting air, achieving nearly 100 percent collection.
- **Grinding** using abrasive grinders is another option to remove paint or surface areas of concrete and steel. These could be as simple as flapper wheels in hand drills. More complex tools have steel disks that can be used for material removal.
- **Needle Scaling** uses hand tools with several steel needles that pound into surfaces, breaking apart very small pieces of concrete. Most of these hand tools have attachments to collect dust and debris. These are useful where the surface is not flat, and when scabbling and shaving units would not be efficient.
- **Abrasive Blasting** is like sandblasting, where one of several types of abrasive materials is blasted against the surface to be removed. This can produce large quantities of secondary waste that the equipment may or may not be able to reuse. This method is advantageous for accessing corners and other hard-to-reach areas.
- **Hydrolazing**, which uses a high-pressure water jet, is one technique to decontaminate steel liner walls in the Spent Fuel Pool and Reactor Pool Cavity.

2.3.2.3 General Approach to Structure Demolition

SSCs would be decontaminated to facilitate open-air demolition. Structures are proposed to be removed to 3 feet below existing grade (so that nothing remains above the existing local grade level, with removal to greater depths as needed) to achieve proper backfill compaction and eliminate void spaces. Structures located below grade include concrete slabs, underground storage tanks, support stanchions, utility vaults, sumps, vehicle barriers, building foundations, tunnels, and similar items. Below-grade interior walls and floors (except for foundation slabs) are typically removed to eliminate the need to perform ~~Final Status Survey~~FSS on these surfaces. Tunnels may also be collapsed to eliminate void spaces or opened to allow future backfilling of the area. Structure demolition may be performed in parallel with SSC removal, based on the selected SSC removal approach.

Prior to performing large-scale structure demolition, the structure must meet pre-established open-air demolition criteria that meet NRC public dose limits at the site boundary using Offsite Dose Calculation Manual (ODCM) methodologies. These criteria are based on residual contamination levels on structure surfaces or within an SSC, and are intended to ensure radiological material is not released to uncontrolled areas or the environment. SSCs that do not meet the open-air criteria would either be protected to ensure large-scale demolition techniques do not pose hazards to personnel or the environment or be surgically removed prior to commencing open-air structure demolition.

The DGC's Project Execution Plan or Program (see Table 2-5), which specifies requirements or controls that must be in place before or during demolition, would incorporate strategies to govern demolition of individual structures or groups of structures. If a structure does not meet the open-air criteria, it may be contained inside a temporary enclosure, with appropriate ventilation and filtration to prevent contamination spreading to uncontrolled areas. As described above, large containment enclosures may be constructed over building locations to allow demolition of building structures. None of the containment enclosures would be higher than the existing containment domes.

A common approach to structure demolition is to use multiple pieces of mechanical equipment with appropriate end tool attachments working simultaneously to collapse the structure into its footprint. Debris created would be reduced in size as needed for efficient waste packaging and sorted/segregated based on its waste classification. Using appropriate tools, thick concrete structures may be cut into blocks that can be removed and shipped. The debris would be loaded into approved waste containers for transportation to the licensed disposal facility. Remaining below-grade structures would likely have penetrations and accessible or embedded piping. The proposed final condition of the structures at the end of the Proposed Project is described below.

- All SSCs, including exterior structure walls and floor slabs, removed to at least 3 feet below existing local grade
- Most systems and components greater than 3 feet below grade (except for some embedded pipe) also removed
- Most interior walls and floors greater than 3 feet below grade removed to lowermost elevations, leaving intact lowest floor slabs

Backfill material would be placed on top of the remaining structures. SCE and its DGC would identify a material during SWPPP development that would be compatible with the surrounding natural environment (i.e., grain size, texture, and color) and that meets permit stabilization requirements. The permanent backfill requirements, which could include retention of the interim backfill following completion of the Future Activities, would be subject to landowner and permitting agency environmental review and approval (SCE 2018g). On sloping grades, consideration would be given to allow for sloping the structure during demolition or a stair-step removal to ensure the final grade provides adequate slope for drainage. The amount of below-grade structure removal onshore would be based on NRC unrestricted use release requirements. Additional below-grade structure removal may occur as part of the Future Activities depending on the end-state requirements for the Onshore Site, as determined by the DoN.

The precise amount of soil excavated to complete Proposed Project decommissioning activities is unknown. For this impact analysis, an order of magnitude estimate of onshore soil excavation volume is 1,458,000 cubic feet. This assumes (SCE 2016a – DR #1-88):

- Excavation, if necessary, around the Containment Buildings, to create a bench at the elevation of the mat slab with an 80-foot-wide base to a depth of 15 feet and a 1:1 slope to grade around the perimeter of the structure
- Excavation, if necessary, on the east side of the Fuel Handling and Rad~~ W~~waste Buildings and the Turbine Buildings at a 0.5:1 slope
- Excavation at the Tank Buildings and Generator Buildings to a depth of 3 feet by 10 feet wide at a 1:1 slope
- Ramps for access to Turbine Building areas
- Layback of retaining wall at north end of NIA at a 2:1 slope
- Six (6) inches of excavation in all paved areas to be removed

This would provide the access needed for demolition equipment to remove all structures to a minimum depth of approximately 3 feet below existing grade.

2.3.3 Containment Building Decontamination and Dismantlement

The SONGS Units 2 and 3 Containment Buildings (domes) are the most prominent structures on the Onshore Site, with a top elevation of 191 feet MLLW at the dome top and a bottom elevation at the floor area of the reactor of about -5 feet MLLW. The surrounding local grade is at about 30 feet MLLW. After SNF is transferred from wet storage to the Approved ISFSI, the Containment Building reactor vessels and other plant components that were exposed to primary coolant water (e.g., steam generators, reactor coolant pumps, and piping) would contain most of the remaining radioactive material. The size, design details (e.g., pre-stressed concrete lined with carbon steel), and SSC content of the Containment Buildings require the decommissioning approaches discussed below.

2.3.3.1 Containment Access Opening

Removal of radioactive components and the reactor vessels from each Containment Building would likely begin by increasing the size of the building's access opening (e.g., by enlarging the existing equipment hatch[15] or creating a new opening). A larger opening would simplify rigging operations required to install disassembly equipment and remove large components. Likely steps to create a larger or new opening include: (1) de-tension and remove the Containment Building steel tendons; (2) cut the structures' inner steel liners using mechanical or thermal tools; and (3) use abrasive cutting or other mechanical equipment to remove sections of the Containment Building reinforced concrete walls.

[15] Enlarging the Containment Building openings has been performed previously during maintenance outages to support SONGS steam generator and reactor head replacement projects.

2.3.3.2 Reactor Vessel and Internals Removal

The reactor vessels are composed of three major assemblies (vessel head, vessel internals, and vessel shell) that would be handled separately for disposal. The portions of the reactor vessel internals that are very radioactive would be separated out for transfer to the Approved ISFSI pad for storage as GTCC waste. Additional security measures would be required until the GTCC waste is in the Approved ISFSI PA. Once the GTCC is removed, several options could be used to dispose of the remaining sections of the internals depending on their waste classification (Class A, B, or C waste).

- The most likely waste disposal method is to further segment the reactor vessel internals into smaller pieces and package them in canisters for transport on truck or train. Segmentation cuts would be engineered to allow for segregation by waste class, since Class B and C waste have different transport and disposal rules than lower-level Class A waste.
- A second approach would be similar to the first approach with additional cutting of each section of the reactor vessel and the corresponding sections of the reactor vessel internals into smaller sizes before final shipping as one package.
- All or some of the remaining reactor vessel internal components could also be returned to the inside of the reactor vessel. Grout would be added inside to prevent moving of pieces during shipping, and openings would be covered with metal plates. The assemblage of these parts would be shipped as one package.

To prepare for this work, both units' reactor refueling cavities would be filled with about 1 million gallons of water (see Section 2.3.10~~3~~, *Water Use and Power Supply*). The reactor vessel internals would be sectioned underwater using remote cutting tools controlled by operators with cameras. Workers using long handle tools from bridges would retrieve, measure dose rates, weigh, and place each piece into underwater containers or into temporary staging areas. The measured dose rate and weight for each piece are used to confirm its waste classification. At times, loaded containers may accumulate on-site while awaiting transport off-site. Additional security measures and temporary shielding may be needed depending on how much radioactive material is in the staging area.

2.3.3.3 Reactor Vessel Head Removal

The reactor vessel head is a large component that is attached to the reactor vessel. The reactor vessel head was routinely removed during refueling operations to access the inside of the reactor vessel. To facilitate disposal of the heads, components mounted on top of the heads would be removed using mechanical or thermal cutting processes. This may be done near the reactor vessel or in another area inside the Containment Building. The heads would likely be cut into two or more pieces for convenient packaging and shipping as Class A waste to a licensed disposal facility. Because of the relatively low dose, all cutting can be done dry (out of water).

Cutting of the reactor vessel heads for shipment is not always necessary. For example, the original SONGS Unit 2 reactor vessel head was shipped off-site in one piece, after removing the components mounted on top. The reactor vessel head was replaced to address concerns related to the use of iron-nickel-chrome alloy for critical parts of the reactor coolant system, which had proven to result in premature aging in the high temperature environment of the reactor coolant system (SCE 2016a – DR #1-7). The Unit 2 and 3 reactor vessel heads were scheduled for replacement in successive refueling outages; however, SONGS was permanently retired prior to the planned Unit 3 outage and therefore only the Unit 2 reactor vessel head was replaced.

2.3.3.4 Reactor Vessel Shell Removal

The reactor vessel shell is a large cylindrical alloy steel vessel with a bottom hemispherical head. The vessel is about 15 feet in diameter with a wall thickness up to 9 inches. The reactor vessel shell would likely be sized for shipping by cutting the vessel into multiple pieces using either mechanical or thermal cutting processes. Surfaces of the cut vessel sections would be sealed and then the cut sections would be packaged for shipment to a licensed disposal facility. Alternatively, the reactor vessel could be shipped as one package, as described above under Reactor Vessel Internals.

2.3.3.5 Removal of Steam Generator, Pressurizer, Reactor Coolant System Piping, and Other Components

Each Containment Building at SONGS contains two steam generators that weigh about 640 tons each. Structural supports and attached piping would likely be removed from each steam generator using disassembly methods such as mechanical and thermal cutting to reduce personnel radiation exposure. The steam generators would then likely be cut into two or more pieces sized for easier handling and shipping. Segmentation into smaller pieces would likely be performed inside the Containment Buildings. Before shipping each piece, cover plates would be installed over all openings, then a protective (lockdown) coating would be applied to affix any possible surface contamination before the pieces are removed from the Containment Buildings. The pieces would be shipped as LLRW to a licensed disposal facility.

Each Containment Building also contains a pressurizer (a 37-foot-long, 9-foot-diameter cylindrical vessel with domed heads on both ends) made of carbon steel with a stainless-steel lining to avoid rusting. Structural supports and piping would likely be disassembled using mechanical or thermal cutting methods. The pressurizer would then likely be removed from the Containment Building in one piece or cut into smaller pieces, if needed, to fit into standard size railcars or boxes, and shipped by truck or rail. Reactor coolant system piping is large diameter (30 to 42 inches) piping, which would likely be cut into small pieces for shipment using either mechanical or thermal cutting equipment. The pipe sections would be packaged (openings sealed or a fixative applied) then shipped as LLRW to a licensed disposal facility. Other contaminated components, such as reactor coolant pumps, valves, and small diameter piping, would be removed with mechanical or thermal cutting equipment, then sealed for shipment or loaded into standard low-activity waste shipping containers for shipment and disposal. Items may be placed in containers or painted with a lockdown paint used to fix and retain contamination to the surface.

2.3.3.6 Containment External Shell Removal

The external shell of each Containment Building consists of a steel-reinforced concrete cylindrical wall with a hemispherical dome. Steel post-tensioning “tendons” (similar to wire cables) are located within the reinforced concrete wall and dome. The tendons are installed in sheathing, which forms ducts through the concrete between anchoring points, with the space between the sheathing and tendon filled with a petroleum-based material for corrosion protection. The post-tensioning cables can be removed before, during, or after building demolition. Before demolition of the external wall and dome, any SSCs and necessary interior walls would have been removed. Steel liners would be removed during the demolition process as the structure is demolished.

The external wall and dome pieces may be free of contamination or have small amounts of internal contamination. Even if the external wall and dome pieces are clean, the DGC may elect to treat them as if contaminated or ship them as radioactive waste. Decontamination efforts may also occur. The containment external wall and dome would be dismantled using two possible approaches. Mechanical tooling may be used to cut the shell into blocks. These blocks would be sized to allow a crane to lift and move these pieces effectively. The crane used (a track style crane or tower crane) would be outside of the Containment Building dome. Once at ground level, the blocks could be further reduced in size or loaded onto railcars or trucks. These blocks would be shipped as clean or radioactive waste depending on whether they are contaminated or not.

Because of the height (approximately 160 feet above existing local grade) and concrete thickness of the containment external shell, there are limited choices for demolition equipment. A combination of abrasive wire saw and large hydraulic (jack) hammer attached to an excavator is the likely approach. The wire saw would cut the external shell into blocks that are removed until the remaining structure is at a low enough elevation to where a jack hammer can break up the lower portions of the structure. Debris generated by the jack hammer would fall to the ground, accumulate, then be retrieved. The wire sawed blocks can be further reduced in size before shipping off-site.

Another approach would use a large excavator with hydraulic rams or similar attachments all around the outside of the structures near ground level to evenly chip away at the wall. This continues to a design point where a vertical area (for instance, ground level up to 4 feet) around the dome is a thin wall. Then, with the operator at a safe distance away, final jack hammering weakens the wall so that small sections collapse in a controlled manner and evenly drop the structure down the approximate distance of the thin wall section (in this case, a 4-foot drop). Debris is removed and disposed of, and the operation resumes. Once low enough, the top of the dome is demolished using long reach jack hammers.

2.3.4 Other Structures, Systems, and Components Removal Methods

In addition to the typical removal methods described for SSCs, the following SSCs have unique qualities that may influence the D&D approach used for their removal.

2.3.4.1 Fuel Handling Buildings/Spent Fuel Pools

Two Fuel Handling Buildings, each containing a steel-lined spent fuel pool (one for each Unit) that stores SNF that is being transferred to the Approved ISFSI, are located adjacent to the Containment Buildings. They include below-grade structures, and their lowest floor level is at 15 feet MLLW (local grade is at 30 feet MLLW). Since the spent fuel pools are no longer required, the SSCs would be prepared for demolition. Prior to beginning structure demolition, highly-contaminated SSCs would be surgically removed. Remaining walls, floors, and the roof would be decontaminated to meet open-air demolition criteria. The above-grade structure would likely be demolished using a large excavator with hydraulic rams or processing shears. Tunnels (e.g., the electrical cable tunnel at approximately 17 feet MLLW) would be decontaminated to permissible levels to meet ~~Final Status Survey~~FSS requirements and would be collapsed and backfilled, or opened from the top and backfilled, or backfilled with concrete slurry.

The spent fuel pools would be prepared for demolition by removing the SNF storage racks. Racks are typically removed in modules, lifted out of the water to a work area, cut to a smaller size if desired, wrapped to contain any contamination, loaded on a truck or rail car, then likely shipped as radioactive waste (decontamination is not considered practical because of the racks' complex geometry and widespread contamination). Spent fuel pool water would be processed as discussed in Section 2.2.3.8, *Water Processing*. Once the spent fuel pools are drained, the stainless-steel pool liner would be removed by mechanical or thermal cutting. These steel plates would be disposed of as radioactive waste. The remaining concrete wall is anticipated to be largely free of contamination. If contamination is found, that area would be decontaminated or removed. The remaining SSCs in the spent fuel pools include heat exchangers, piping, and cranes, which would likely be removed and disposed of as radioactive material.

2.3.4.2 Auxiliary Building Area

The ABA includes a Radwaste Area, Control Area, and Penetration Areas (see Table 2-2). Each area would be decommissioned as described below.

- **Radwaste Area.** The Auxiliary Building Radwaste Area has five floors below the roof. The tallest part of the Radwaste Area side of the structure is at approximately 99 feet MLLW and the lowest floor is at 9 feet MLLW. All systems (e.g., fire protection, gas, water, and waste lines) would be isolated and drained before demolition. All or some of the contaminated building areas and SSCs may be demolished without decontamination, provided open-air demolition levels are achieved by means such as affixing the removable surface contamination with adhesives or paints. If decontamination is selected, loose items and attached components may be removed. Piping, conduits, and duct work would be cut free. Some large tanks may need surrounding walls removed to allow access. Hazardous wastes would be separated and disposed of via approved waste streams. Once the SSCs are removed as needed to meet decontamination criteria, the remaining structure would be evaluated for residual contamination, with decontamination as required or removal and disposal of certain areas via a contaminated waste stream.

- **Control Area.** The Auxiliary Building Control Area (containing the Control Room, electronics, computers, etc.) is radiologically clean. However, the large amount of wiring and instrumentation would be evaluated for hazardous characteristics and universal waste and would be properly removed. The control side of the Auxiliary Building has four floors plus items on the roof. The tallest part of the structure is about 105 feet MLLW; the lowest floor top surface is at 9 feet MLLW. Selected interior items would be pulled, unbolted, or cut out and separated for disposal via approved waste streams. Once hazardous and universal waste streams and the necessary SSCs are removed, the remaining structure would be re-evaluated for any contamination. If appropriate, decontamination can be done in some areas.
- **Penetration Areas.** SONGS Units 2 and 3 each contain a Penetration Area. The lowest floor of the building is at 9 feet MLLW (except for a small area at 0 feet MLLW, accessed by ladder) with a roof at approximately 95 feet MLLW, and ventilation equipment and jib cranes located above this height. Some areas are radiologically contaminated. Prior to demolition, physical connections to the Containment Buildings would be severed, and cables and pipes removed, as necessary. Site characterization would identify known radiological and other hazardous waste and universal waste to be properly removed prior to demolition.

At this point, the Radwaste, Control, and Penetration Areas of the Auxiliary Building would be in the same condition, and D&D of the whole Auxiliary Building can begin. Various forms of contamination may remain within the structure. Some or all the interior walls, ceilings, and floors can be removed. Interior wall removal is likely necessary to complete the final removal of storage tanks, pipes, and other hard-to-reach SSCs.

Some areas inside the Auxiliary Building are radioactively contaminated. Controls would be established before a wall, ceiling, door, or floor is breached to any areas that may contain residual hazards. When a radiologically contaminated area is demolished, it would be isolated as an RCA, with entry into the area controlled in accordance with NRC and other regulatory requirements. Demolition and all other equipment used in this area would be designed for RCA use only and would be evaluated for residual contamination and cleared before being moved outside the area. A contaminated structure demolition may require a temporary structure to control and monitor contamination.

~~Areas where loose contamination or debris have fallen would be temporarily covered with a layer of soil or concrete rubble. The area where contaminated debris falls would be surveyed for residual contamination and remediated after completion of structure demolition.~~ To prevent any airborne movement of contamination from leaving the area, appropriate controls would be in place. The contamination may be locked down or covered so it cannot go airborne. The area where the contaminated debris falls would be protected by appropriate barriers, such as containment tents, truck tarps, geotextile fabric, visqueen, extra layers of soil cover, or other similar controls, to prevent any loose contamination or small pieces of debris from entering the ground. Any material that falls on the ground, along with the surrounding layer of soil, would be removed and tested in accordance with FSS criteria. If material and soil test below the FSS radiological and non-radiological thresholds, it is acceptable for site backfill. If material and soil test above the FSS thresholds, it would be shipped offsite to a Class A radiological waste facility. (SCE 2018n).

Additionally, dust suppression controls would be utilized to prevent debris from becoming airborne when moving material to stockpiles and loading material into containers. Methods could include wetting the materials prior to movement and covering stockpiled materials. Other contamination controls could include, but are not limited to, applying a fixative to the material prior to movement, or storing material in a tented area under negative air pressure. Periodic contamination surveys of stockpiled material would be performed to confirm the effectiveness of controls and containment. (SCE 2018n)

Typically, demolition starts from the top down. Soil around exterior walls would be excavated to a depth needed to allow demolition from the top of the wall down to the desired elevation. Any contaminated soil would be removed and disposed of via an approved waste stream. As large pieces of the upper sections begin to collect on the ground, they would be moved to processing areas where steel rebar or other items can be separated from the concrete. A portable concrete crusher (permitted by the local air quality management district or California Air Resources Board, as required), would crush the concrete and any embedded items would be removed. Concrete crushing would occur at an average rate of 1,500 tons per 8-hour day for an estimated 170 days (SCE 2017b). Larger concrete blocks would be broken into manageable pieces. In rubble form, the concrete can be packaged and shipped in truck or railcar more efficiently. Because demolishing and crushing concrete generate dust, water would be used to minimize fugitive dust emissions (see Section 2.3.1~~3~~0, *Water Use and Power Supply*).

2.3.4.3 Turbine Buildings

The Turbine Buildings are open-air buildings located on the west side of the Onshore Site and are some of the largest onshore structures. The bottom floors of the Turbine Buildings are at elevation 7 feet MLLW, with an intermediate floor elevation of 46 feet MLLW, and a roof deck elevation of 72.5 feet MLLW; the bottom floor of the Full Flow Condensate Polishing Demineralizer area is at elevation 30.5 feet MLLW (SCE 2016a – DR #1-9). The Gantry Crane is associated with the Turbine Building and has a top elevation of approximately 128 feet MLLW. The Gantry Crane trolley rides on rails along the top of the Gantry Crane structure. The roof of the Gantry Crane trolley is at an elevation of 137.5 feet MLLW. Prior to demolition of the Turbine Buildings, the Gantry Crane would be used to remove the large components located within and on the decks of these buildings. The buildings house heaters, pumps, fans, condenser water boxes, and electrical load centers that are removable through hatch openings in the decks. The crane would also be used to remove the turbine casings and rotors and the generator (SCE 2016a – DR #1-10).

The Turbine Buildings would be dismantled primarily by unbolting, cutting, or use of mechanical shears. Implosion (placing explosive material and timing the detonation so that the structure collapses on itself) would not be used (SCE 2017b). To gain access to the lower SSCs, access may need to be created or enlarged in the floors and walls. Once the building has been gutted of large components for which the Gantry Crane is required, the Gantry Crane would be demolished. After large items are removed, remaining items that have a potential for contamination would be removed, if accessible. Non-accessible items would be identified and removed in a controlled manner after the structure is demolished. Penetrations and piping leaving the buildings would be surveyed for contamination. Some may be cut free from the building structure and capped at this time or done later. The Turbine Buildings also include key SSCs that do not require unique D&D methods: Turbines/Generators/Exciters; Reheaters; Lubricating Oil Heaters; Feedwater Pumps; Piping; Gantry Crane; and Tunnels.

2.3.4.4 Intake Structure Area

The ISA is located within the Onshore Site at the Units 2 and 3 seawall and connects to the offshore conduits. This area is anticipated to be free of contamination and all SSCs in this area would be removed in accordance with methods described in Section 2.3.2, *Decontamination and Dismantlement*. Mechanical/thermal cutting methods would remove SSCs, which include water pumps, traveling water and bar screens, sluice and main stop gates, piping, and jib cranes. Large pieces of concrete and steel would also be removed.

2.3.4.5 Unit 1 Reactor Vessel

The SONGS Unit 1 reactor vessel package is in a shielded container stored in the northeast corner of the NIA. The preferred option for the Unit 1 reactor vessel is one-piece shipment in its current package to a disposal facility. However, if size or weight limitations preclude one-piece shipment, the reactor vessel would be cut into pieces prior to shipment. Before cutting, the package would be set up as a temporary RCA, with appropriate controls. Cutting debris would be confined to a small area using localized barriers (e.g., plastic drop cloths). After cutting, the openings would be covered and sealed with steel plates. Removal of the SONGS Unit 1 reactor vessel package from the site would be done by the DGC in parallel with other D&D activities.

2.3.5 Removal of Other Infrastructure

2.3.5.1 Retaining Wall between Units 2/3 and North Industrial Area

The ~~short (less than 5-foot-tall)~~10-foot-tall retaining wall between the NIA and SONGS Units 2 and 3 would be removed and disposed of as any other non-contaminated SSC. The area where the retaining wall was located would be stabilized by creating a 2:1 slope. All erosion controls and BMPs would be implemented and maintained in accordance with the requirements of the SWPPP (SCE 2018g).

2.3.5.2 Utilities

The SONGS Proposed Project area contains utility poles, guardrails, fire hydrants, piping, electrical conduits, vaults, tanks, sanitary sewer lines, and other SSCs that are not located in a building. These SSCs, including any added to support D&D work, would be removed as required, except those needed for the Approved ISFSI and switchyard. Prior to demolition, sanitary sewer lines would be flushed with clean water to the main sewer line. After flushing is completed, the line would be isolated at the main line outside the building and all openings to the sanitary sewer in the building would be plugged with a watertight seal to prevent accidental releases to the sanitary sewer system. Above-grade SSCs would be removed by methods described in Section 2.3.2.1, *General Approach to System and Component Removal*, and Section 2.3.2.3, *General Approach to Structure Demolition*. Below-grade or transitioning-below-grade SSCs would be removed as required to achieve NRC unrestricted release criteria[16], to perform a ~~Final Status Survey~~FSS on the SSC, or to avoid leaving a void space that would be created if the SSC was abandoned in place.

2.3.5.3 Parking Lots, Access Roads, and Railroad Tracks

Some parking lots and access roads may be needed for the Approved ISFSI and switchyard operation and maintenance, and Future Activities. This could include Parking Lots 1, 2, 3, and 4, and access roads to the SYA and NIA areas. Access roads and parking lots that are no longer needed would be demolished during the Proposed Project. These SSCs are primarily composed of concrete or asphalt. Construction equipment would be used to remove the material and reduce the size of the waste material for efficient packaging. Waste would be segregated and re-used or disposed of at an approved

[16] The NRC unrestricted use release limit is 25 milirem per year (mrem/yr). The SONGS Participants have contracted for a post-Proposed Project residual release criteria of 15 mrem/yr. In 2015, the DoN directed SCE to show that the Mesa lease parcels 5, 6, and 7, which contained support facilities located east of Interstate 5, would achieve a release criteria of no more than 12 mrem/yr. As the landowner, the DoN may ultimately require decontamination to a lower threshold than what is required under NRC regulations. (SCE 2018j – DR#7-7)

disposal facility. After removal, backfill material may be required to obtain a level grade and ensure appropriate sloping for stormwater drainage.

Railroad tracks would be inspected, evaluated for use, and remain in place or expanded if needed to support Approved ISFSI operations, ship SNF off-site, and support Future Activities. If determined to be of benefit for decommissioning, they would be removed during Future Activities. An excavator or other large construction equipment would remove all unneeded railroad tracks in the PA and asphalt or concrete located under or near the rails.

2.3.6 Offshore Conduit Disposition and Related CSLC Lease Offshore Activities

SONGS Units 2 and 3 used seawater pumped through intake conduits and discharged through discharge conduits to remove waste heat generated during the thermal cycle during plant operations. This “once-through cooling” ended when SONGS shut down; cooling in the Spent Fuel Pool Island (SFPI) system (approved under CCC CDP No. 9-15-0162; CCC 2015c) does not require cooling with ocean water; however, a significantly reduced intake of water is still used for waste dilution per the facility’s NPDES permit. In January 2018, the average Unit 2 intake was 9.91 million gallons per day (MGD) and the average for Unit 3 was 11.43 MGD (SCE-AM 2018d). The conduits are constructed of 18-foot-inner-diameter steel-reinforced concrete pipe buried below the seafloor and covered with an estimated 3 to 4 feet of sand/gravel backfill and 2 feet of accumulated sediment.[17] As shown in Figure 1-2 in Section 1.0, *Introduction*, each intake conduit is about 0.63 mile (3,300 feet) long measured from the onshore seawall to the Primary Offshore Intake Structure (POIS) situated at the seaward end of each conduit; the discharge conduits are about 1.6 miles (8,400 feet) and 1.1 miles (6,000 feet) long, respectively. The conduits for each unit are spaced 40 feet apart on center. As they extend seaward from the seawall, the Units 2 and 3 conduit pairs diverge from each other to a point about 0.47 mile (2,500 feet) from the seawall where they run in parallel. For the parallel portion of the conduit pairs, the two intake conduits are about 634 feet apart from each other, measured from the conduit centerline, and the two discharge conduits are about 714 feet apart, measured from conduit centerline. Specific components of the offshore conduits are described in more detail below. The Applicant would abandon these conduits in place, after removing vertical structures on the conduits as discussed below.

2.3.6.1 Offshore Intake System

Seawater is drawn into the intake conduits at their respective POISs by onshore pumps and directed to the onshore plant systems. Each POIS structure, which connects to the

[17] This EIR assumes an even 6-foot coverage over the conduits based on a 2-foot sediment layer, plus a 3- to 4-foot sand/gravel backfill layer. (A November 2010 visual inspection of the Unit 3 primary offshore intake structure indicated a 2- to 3.5-foot range in depth of accumulated material [SCE 2016c]. A prior engineering study (Gerwick 2003) for the Unit 1 intake/discharge conduits contains a conduit profile that illustrates a trend of sedimentation, as opposed to erosion or scouring [SCE 2016c]).