4.10 Hazardous and Radiological Materials

This section of the EIR describes conditions as they are currently known relative to hazardous and radiological materials associated with the decontamination and dismantlement of Diablo Canyon Power Plant (DCPP) Units 1 and 2, and the proposed Greater-Than-Class C (GTCC) Waste Storage Facility (the Proposed Project).[21] The structures, systems, and components (SSCs) that would be decommissioned are described in Section 2.0, *Project Description*. The geographic scope of this EIR covers activities proposed onshore at the DCPP site and offshore on tidal and submerged lands (PG&E, 2021c). The analysis also considers potential activities related to the transfer of radiological materials at a railyard located in the County of Santa Barbara (the railyard site in the City of Pismo Beach would be limited to non-radiological materials). PG&E has provided formal notification to the Nuclear Regulatory Commission (NRC) that it intends to permanently cease power operations of DCPP on November 2, 2024, for Unit 1 and August 26, 2025, for Unit 2 (PG&E, 2018a), but this review reflects both existing and anticipated future conditions after the final shutdown of the two units with Unit 1's closure beginning in 2024.

Following permanent shutdown, NRC regulations establish safety requirements associated with PG&E's removal of the nuclear power reactors from service. PG&E is also required to ensure site remediation activities reduce the residual radioactivity to the level that permits unrestricted or restricted use (10 Code of Federal Regulations [CFR] 50.2). NRC's 10 CFR 50.82 (Termination of License) sets forth the required steps for permanently shutting down a reactor, decommissioning a reactor, and terminating the reactor's operating license (NRC, 1988a). PG&E submitted for the NRC's review a Post Shutdown Decommissioning Activities Report (PSDAR) in 2019 (PG&E, 2019a) and a revised version (Revision 1) in 2022 (PG&E, 2022a), Irradiated Fuel Management Plan (IFMP) (Revision 1) in 2022 (PG&E, 2022b), and a Site-Specific Decommissioning Cost Estimate (SSDCE) (Revision 1) in 2022 (PG&E, 2022c) for the NRC's review. The submittals provide plans for radiological decommissioning, the decommissioning schedule, an assessment of the impact on the environment, the spent nuclear fuel (SNF) handling plans, and the cost to decommission the nuclear power reactors. Approximately two years before the end of the decommissioning process, PG&E is required to submit a License Termination Plan (LTP) that describes the remaining decommissioning activities and provides a final site survey to justify termination of the plant's operating licenses pursuant to 10 CFR 50.82(a)(11) (NRC, 1988a).

The NRC oversees plants undergoing decommissioning to:

- Confirm, through direct observation and verification, that decommissioning activities are being conducted safely, the spent nuclear fuel is being stored safely, and activities at the site are being conducted in accordance with all applicable federal regulations and any additional commitments, if applicable.
- Confirm that the administrative controls that the licensee has in place are adequate and comply with regulatory requirements (NRC's administrative controls include self-assessment, audits and corrective actions, design control, safety review, maintenance and surveillance, radiation protection, and effluent controls).

[21] GTCC wastes are defined as those wastes with concentrations of radionuclides which exceed the NRC limits established for Class C LLRW.

- Identify compliance with performance trends and verify that the licensee has taken actions to reverse any declining trends in performance requirements.

Inspection procedures used by the NRC during decommissioning activities are prescribed by NRC's Inspection Manual, Chapters 2561 (NRC, 2003), 2602 (NRC, 2005), and 2605 (NRC, 1996a). The NRC staff would continue to inspect DCPP while the reactors are operating and during decommissioning activities following shutdown of the reactors. The objectives of the inspections are to ensure that site operations comply with regulatory requirements, licensee commitments, and management controls; that SNF is transferred and stored safely, and that the reactors are decommissioned safely. Some of the specific areas and subjects of inspection under NRC's jurisdiction include:

- Operations
- Safety reviews, design changes, and modifications
- Maintenance and surveillance
- Physical Security assessment
- Spent fuel pool safety
- Occupational radiation exposure
- Radwaste treatment, and effluent and environmental monitoring
- Transfer and continued storage of SNF in the ISFSI.

To assess the effectiveness of PG&E's regulatory compliance programs at DCPP, the preparation of this EIR included a review of significant enforcement actions by the NRC between 2016 and 2021. In 2016, DCPP was issued one citation of low-to-moderate safety significance (NRC, 2016b). The finding referenced a failure to develop adequate instructions for the installation of external limit switches on motor-operated valves in violation of DCPP Technical Specification 5.4.1.a, "Procedures." No other significant enforcement actions were issued for the other years.[22]

During more recent NRC inspections conducted between January and July 1, 2021, only one finding of very low safety significance was documented. This finding involved NRC requirements and was treated as a non-cited violation consistent with Section 2.3.2 of the Enforcement Policy (NRC, 2021b). No findings or violations of notable significance were identified during the other 2021 inspections (NRC, 2021c through NRC 2021i).[23]

At the conclusion of decommissioning activities under the Proposed Project, PG&E must submit a Final Status Survey (FSS) that documents the final radiological conditions of the site, and request that the NRC terminate PG&E's 10 CFR Part 50 operating licenses and reduce the Federally-mandated security boundary to the footprint of the separately licensed ISFSI and the GTCC Waste Storage Facility. The NRC would approve the FSS Report and the licensee's request if it determines that the licensee has met both of the following conditions:

- The dismantlement has been performed in accordance with the approved LTP; and
- The final radiation survey and associated documentation demonstrate that the facility and site are suitable for release in accordance with the License Termination Rule (LTR) in 10 CFR Part 50 (NRC, 1988a).

[22] Enforcement actions may be accessed on the website: https://www.nrc.gov/about-nrc/regulatory/enforcement/current/reactor-actions/2021.html.

[23] Reports for all NRC inspections of nuclear power reactors may be accessed at https://www.nrc.gov/reactors/operating/oversight/listofrpts-body.html.

As described in Section 2.0, *Project Description*, implementation of the DCPP decommissioning plan by PG&E would remove radioactive material and hazardous substances to minimal, residual levels that would allow the site, with concurrence from the NRC and other state and local regulators, to be released for unrestricted use. Typically, the NRC's threshold for a site to be considered acceptable for unrestricted use is if the residual radioactivity that is distinguishable from background radiation results does not exceed 25 millirem per year, including that from groundwater sources of drinking water, and that the residual radioactivity has been reduced to levels that are as low as reasonably achievable (ALARA).

PG&E would prepare a LTP and submit it to the NRC. The threshold for unrestricted use included in the LTP would be based on the agreed-upon clean-up criteria that establish the guidelines for the Final Status Survey and ultimate termination of the DCPP NRC licenses, based on NRC regulations.

According to the most recent IFMP (PG&E, 2022b, p. 4), if there is an existing United States Department of Energy (DOE) facility in place and fully permitted by 2031, PG&E could begin transferring SNF and GTCC waste from the ISFSI and the GTCC Waste Storage Facility to the DOE in 2038, with the completion of the transfer by 2067. These fuel transfer activities are not part of the Proposed Project but are mentioned here for informational purposes in the interest of public disclosure. There is currently no indication that a DOE facility will be in place and able to accept SNF by 2031. Once the SNF is transferred, PG&E would complete the final decommissioning process for the entire site, including the ISFSI and the GTCC Waste Storage, which per the PSDAR is anticipated to occur in 2076 (PG&E, 2022a, p. 10).

Potential options for earlier disposition of SNF and GTCC waste, including the possible availability of one or more commercial Consolidated Interim Storage Facilities (CISF) (NRC, 2021j), are discussed in EIR Appendix G1. The Diablo Canyon Decommissioning Engagement Panel (DCDEP) recommended that PG&E move the SNF and GTCC waste stored in the DCPP ISFSI to a CISF (if a permanent federal repository is not available) as soon as such site becomes operational, presuming a safe transportation method for movement is developed and followed. However, the recommendation was not unanimous – another DCDEP member has presented an opposition paper recommending the SNF remain at the DCPP site until such time as a permanent federal repository exists (DCDEP, 2022).

Scoping Comments Received. During the scoping comment period for the EIR, written and verbal comments were received from agencies, organizations, and the public. These comments identified various substantive issues and concerns relevant to the EIR analysis. Appendix B includes all comments received during the scoping comment period. The following list provides a summary of scoping comments applicable to this issue area and considered in preparing this section:

- Clarify the length of time that decommissioned materials would be stored on site, the method of storage, the safety measures put in place to ensure that materials would be stored safely, the travel routes that would be used to transfer materials and the days and hours that this would occur, including at locations in proximity to residential areas.
- Clarify if dry cask storage will be able to withstand the impacts of routine aging, seismic risks, threats of terrorism, and impacts from the ocean environment, and how will they be monitored and repaired.

- Ensure safety of stored/packaged radioactive material; describe the best transportation and storage methods for them.
- Describe monitoring methods during facility dismantling for identifying contamination of land, sea, and air.
- Assess the potential effect of the elements and sabotage to the existing dry casks at the ISFSI.
- Describe procedures to address adverse unexpected events and emergencies.
- Address effects of the Pismo Beach Railyard (PBR) on the surrounding residential homes and Judkins Middle School.
- Continue to monitor for radiological contaminants in the surrounding lands and ocean and inform the visiting public of any on-site radiological contamination and related health concerns.
- Address toxic risks associated with proposed concrete batch plants and other proposed site infrastructure modifications.
- Evaluate use of a climate-controlled containment area to protect existing dry casks at the ISFSI, including use of the containment domes for this purpose.
- Describe if a hot cell or similar system will be installed.
- Assess use of a hardened on-site storage facility.
- Describe the criteria used to determine reuse vs disposal of materials.
- Confirm if the proposed facility to store greater than Class C waste would be within or outside the coastal zone.

4.10.1 Environmental Setting

This environmental setting section focuses on the hazards related to radiological and hazardous materials associated with the Proposed Project.

The Proposed Project includes the Diablo Canyon Power Plant (DCPP), PBR, and the Santa Maria Valley Railyard – Betteravia Industrial Park (SMVR-SB). The 750-acre onshore portion of the DCPP site has no permanent residents. The nearest residential areas are in Avila Beach and Los Osos, which are located approximately 7 miles southeast and approximately 8 miles north of the DCPP site, respectively.

PBR is an approximately 25.5-acre site located approximately 0.3 mile from Highway 101 at 800 Price Canyon Road in the City of Pismo Beach. The PBR facility has undeveloped land to the north with a scattering of residences along Price Canyon Road; a Union Pacific Railroad line and open space to the east, with residential development further east; the City of Pismo Beach's waste-water treatment plant and public sports complex to the south; residences to the southwest and west; and a middle school, church, police station, and fire station to the west (west of Price Canyon Road).The SMVR-SB site is located approximately 1.6 miles west of the City of Santa Maria in the County of Santa Barbara at 2820 W. Betteravia Road. The site is approximately 28.4 acres, bordered to the north by Betteravia Road and agricultural processing uses (on the north side of Betteravia Road), on the west, south, and east by agricultural fields.

4.10.1.1 Hazardous Materials

The term hazardous material is defined by California Health and Safety Code (H&SC) Section 25501(n) and (o) as:

> *Any material that, because of its quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment if released into the workplace or the environment. 'Hazardous materials' include, but are not limited to, hazardous substances, hazardous wastes, and any material which a handler or the administering agency has a reasonable basis for believing that it would be injurious to the health and safety of persons or harmful to the environment if released into the workplace or the environment.*

Fuels, oils, lubricants, adhesives, and cleansers are all considered hazardous materials when they serve no useful purpose and become waste. The most common examples of the types of materials and wastes considered hazardous are hazardous chemicals defined by four characteristics: toxicity, ignitability, corrosivity, and reactivity. The characteristics of toxicity, ignitability, corrosivity, and reactivity are defined in California Code of Regulations (CCR) Title 22, sections 66261.20-66261.24. Hazardous materials concerns are related to the potential for fires, explosions, or the accidental exposure, acute inhalation or dermal contact with a hazardous material in the event of an unauthorized release, or unanticipated releases or spills to the surrounding environment.

DCPP is a large industrial facility that stores and uses many hazardous non-radiological materials for operation and maintenance. Hazardous chemicals include solvents, paints, cleaners, sealers, acids, hydraulic and motor oil, and diesel fuel. Many hazardous gases including argon, helium, butane, propane, freon, hydrogen/helium mix, nitrogen, methane, and oxygen are also stored on site. Mineral oil is also contained in electrical equipment for cooling of electrical transformer equipment. Several structures (building materials) onsite are known to contain asbestos and lead-based paint. Use of chemicals during operations may create hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA) or California hazardous waste regulation and non-RCRA waste.

GeoTracker is the State Water Resources Control Board (SWRCB) data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater. A review of the GeoTracker website indicates no listed hazardous material or contamination data for the subject site or any site within 3 miles of the DCPP (SWRCB, 2022a).

A review of the Department of Toxic Substances Control (DTSC) EnviroStor website indicates that on November 3, 2021, and December 7, 2021, the DTSC conducted a Compliance Evaluation Inspection and Financial Responsibility Review of PG&E/Diablo Canyon. The DTSC did not discover any Class I or Class II violations of the Hazardous Waste Control Law and its implementing regulations during this inspection; however, a Minor violation was noted. A review of the manifests received and uploaded to the DTSC hazardous waste tracking system (HWTS) database indicates DCPP failed to send the generator copy of the manifest to DTSC as required in CCR Title 22, sections 66262.21 (f) and 66262.23(a)(4). DTSC received the manifest copies from

the final designated facility for these manifests but not the generator copies from DCPP. DCPP resolved this violation on December 23, 2021. (DTSC, 2022a)

Hazardous material categories associated with routine operation of DCPP include nine classifications, which are provided in Table 4.10-1 with examples, uses, and potential hazards.

Table 4.10-1 DCPP Hazardous Materials Summary

Substance	Examples	Typical Use(s)	Hazard(s)
Solvents	Alcohol, ether, toluene, hexane, trichloroethylene	Lab chemicals, paint removers, and degreasers	Flammable, some explosive; toxic; damage to skin and respiratory tract; systemic damage to liver, kidneys nervous system, etc.
Oxidizers	Boric, chromic, permanganic, sulfuric acids, silver nitrate, potassium dicholorate, ammonium persulfate	Lab chemicals	Stimulates combustion of organic materials
Compressed Gases	Methane, oxygen, and nitrogen	Labs, welding, and maintenance	Flammable, some explosive (with potential for propellant effect) and some toxic
Corrosives	Boric, chromic, dipicolinic, oxalic, permanganic, sulfuric acids, sodium hydroxide, and ammonium hydroxide	Lab chemicals, cleaning agents, paints, paint thinners, and freon	Dermal contact (damage to skin, eyes and respiratory tract); some react to produce fire, explosion, or toxic fumes
Reactives	Lithium hydroxide, alkyl metals (sodium, potassium), and hydrides	*pH* Balancing	Explosive (with or without deto-nation); toxic fumes; explodes with exposure to water
Toxics	Metals, chlorinated hydrocarbons (solvents)	Lab chemicals, biocides, pesticides, dyes, and paints	Potential for acute or chronic systemic damage or death, cancer, infertility, birth defects
Radioactivity	Radionuclides (radioisotopes), uranium	Reactor	Potential for acute or chronic systemic damage, cancer, infertility, birth defects
Fuels	Gasoline, diesel, and waste oil, lubricants	Vehicles, Generators, Machinery	Flammable, explosive; toxic; dermal contact (damage to skin), eyes, and respiratory tract

Source: PG&E, 2021c.

The PBR site is a PG&E-owned material and equipment storage facility located at 800 Price Canyon Road within the City of Pismo Beach. The site would be used as a contingency site for the transport of non-radiological hazardous materials by rail. A review of the SWRCB GeoTracker website indicates no listed hazardous material or contamination data for the subject site (SWRCB, 2022c).

A review of the DTSC EnviroStor website indicates that the Army Recreation Camp (approximately 1.2 miles south of the PBR site) was used as a recreation camp for soldiers from surrounding army camps. Records show it was operated from 1942 until 1945. There is no evidence of any hazardous substance release, and the property has been developed with residential uses ever since. DTSC has determined that no further action is required. (DTSC, 2022b).

Past uses at the SMVR-SB site include use by the Santa Maria Valley Railroad as a railyard and as a sugar factory owned by the Union Sugar Factory Company. The site still contains rail lines and some structures that were used by the sugar factory. The SMVR-SB site is generally surrounded by agricultural properties. A review of the SWRCB GeoTracker website indicates no listed hazardous material or contamination data for the subject site. A case closed leaking underground tank (LUST) site is listed north across the road; the site is listed at Betteravia By-Products and is listed as having gasoline impacted soil that was cleaned up via excavation and was listed as case closed in 1990. (SWRCB, 2022b). The SMVR-SB site would be used to ship radioactive and non-radioactive waste. No other waste or hazardous material would be used or stored at the site as part of the Proposed Project.

4.10.1.2 Radiological Materials

DCPP has an NRC approved and licensed ISFSI, Materials License No. SNM-2511, which describes the methods and procedures implemented to protect workers, the public, and the environment from potential radiological hazards associated with the storage of SNF. The ISFSI license expires on March 22, 2024. On March 9, 2022, PG&E applied for an amendment to renew its ISFSI license for an additional 40 years beyond the current expiration date. A GTCC Waste Storage Facility would be built as part of the Proposed Project; this facility would be separate from the ISFSI and require additional NRC licensing and permitting actions (PG&E, 2022a). The ISFSI and GTCC Waste Storage Facility are to remain on site until or unless the DOE takes possession of the SNF and GTCC waste. Once the SNF and the GTCC waste are removed from the site or sent to a CISF, the ISFSI and GTCC Waste Storage Facility would undergo a separate decommissioning process to achieve final clean-up criteria established for them. No decommissioning of the ISFSI and/or GTCC Waste Storage Facility decommissioning are part of the Proposed Project.

This EIR discusses both the status of radiological hazards and the anticipated impacts of future decommissioning activities associated with the Proposed Project, which are expected to begin in 2024. Because the construction methods and procedures PG&E plans to use during decommissioning are based on standard industry practices, the assessment of the activities are bounded by the scope of the NRC's Generic Environmental Impact Statement (GEIS) analysis documents, which are contained in NRC technical reports NUREG-0586 (NRC, 2002b) and NUREG-2157 (NRC, 2014). The technical scope and approach to decommissioning are described in the PSDAR, Revision 1 (PG&E, 2022a) and this EIR's Project Description (see Section 2, *Project Description (Phases 1 and 2)*). PG&E has an obligation to provide the NRC notification of significant changes as required by 10 CFR 50.82 (a)(7) and 10 CFR 50.54 (bb).

As noted above, Appendix G1 of this EIR summarizes the management, storage, transportation, and disposal of SNF and high-level radioactive waste (HLW) associated with the decommissioning of DCPP, including on-site storage and off-site transport and disposal. Appendix G1 also includes information on recent activity related to the approval of potential commercial CISFs in the United States. Appendix G2 provides general background information on transportation of SNF, HLW, and radioactive materials, and the associated risks and industry experience. Appendix G3 summarizes the potential environmental impacts of stored SNF based on the NRC (2014) GEIS. Appendix G4, entitled *Radiation Basics* includes a discussion of background information and terminology about both natural and man-made sources of radiation, and their risks to people and

the environment. Appendix G5 describes the US Department of Transportation (DOT) approach and oversight of the regulation of radioactive materials.

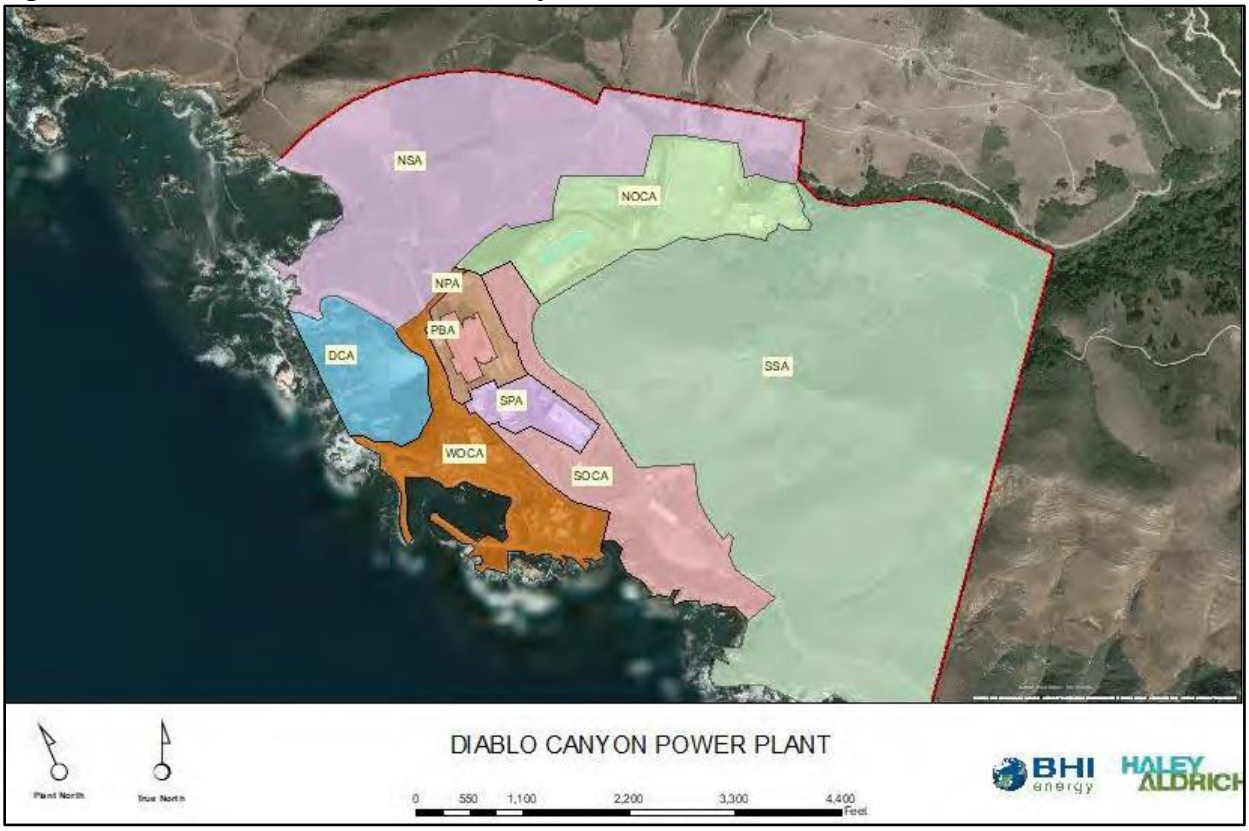
4.10.1.2.1 Nature and Extent of Known or Suspected Radiological Contamination at DCPP

As described in PG&E's Site Characterization Study (PG&E, 2018b), the DCPP site was divided into 9 zones or study areas as a convenient geographic framework for characterizing radiological contamination and for tracking and documenting the decontamination and dismantling of facilities. Table 4.10-2 presents the names and acronyms of the various areas, and Figure 4.10-1 shows their location and orientation within the DCPP site boundary.

Table 4.10-2. DCPP Site Characterization Study Area Designations

Study Area	Acronym
Power Block Area	PBA
South Protected Area	SPA
North Protected Area	NPA
South Owner Controlled Area	SOCA
West Owner Controlled Area	WOCA
North Owner Controlled Area	NOCA
Discharge Cove Area	DCA
North Site Area	NSA
South Site Area	SSA

Figure 4.10-1. Site Characterization Study Zones



Source: PG&E, 2021c - Figure 3.8-1.

Tables 4.10-3 and 4.10-4 below provide details about the facilities, structures and systems that are known to be or are potentially contaminated. Most radiological decontamination would occur during the Building Demolition portion within Phase 1 of the Proposed Project (PG&E, 2022a, PG&E, 2021c). PG&E has proposed to divide the Building Demolition activities into multiple sub-activities (PG&E, 2021c) that are described individually in this EIR (sections noted), including (but not limited to):

- Section 2.3.5, *System and Area Closure*
- Section 2.3.8, *Decontamination*
- Section 2.3.9, *Building Demolition*
- Section 2.3.10, *Reactor Pressure Vessel and Internals Removal and Disposal*
- Section 2.3.11, *Large Component Removal*
- Section 2.3.12, *Utilities, Remaining Structures, Roads, and Parking Areas Demolition*

Building Demolition involves decontamination, dismantlement, and removal of contaminated and potentially contaminated above-ground and below-grade facilities and structures, which would be transported to a permitted disposal facility. Examples of such facilities and activities include the segmentation and removal of the Units 1 and 2 reactor pressure vessels, decontamination and demolition of the fuel handling building, turbine building, containment buildings, auxiliary buildings, discharge structure, and various support buildings.

In addition to the actual demolition construction activities, Phase 1 of the Proposed Project includes extensive sampling and analytical work to ensure that the nature and extent of radiological contamination is well understood. Section 2.3.7, *Site Characterization Study,* describes the initial survey results with the survey plan incorporated as an attachment to the Study to characterize contamination. As the Proposed Project proceeds, further partial surveys would be utilized to characterize areas that have not been sampled, or are not currently accessible, and document the final decontamination of contaminated areas. During the Building Demolition phase, site restoration activities would also be performed on portions of the site outside of the lSFSI area (PG&E, 2022a). All work products would be submitted to the NRC for review and acceptance.

To begin the process of identifying in detail where contaminated facilities, structures, and other materials such as soil or groundwater were likely to be present, PG&E prepared the preliminary DCPP Site Characterization Study (PG&E, 2018b), which analyzed both radiological and non-radiological hazards at the site. Attachment 1 to the preliminary DCPP Site Characterization Study is the Historical Site Assessment (HSA) Report, which summarizes current knowledge of the nature and extent of both radiological and hazardous material contamination and identifies potential gaps in radiological data at the site (PG&E, 2018b). The DCPP Site Characterization Plan (Plan) was also included as Attachment 2 to the preliminary DCPP Site Characterization Study (PG&E, 2018b), and proposes the objectives, Data Quality Objectives (DQOs), decision criteria, methodology, and investigation process for future radiological sampling and site characterization activities during and after decommissioning. This Plan was designed to ensure that radiological data adequate to comply with all NRC regulatory requirements would be collected during and after decommissioning activities, and to demonstrate that the decommissioned site would meet all cleanup standards. Future site characterization activities necessary to support the Final Status Surveys (FSS) are expected to begin in 2024.

The SCS would be carried out in two steps. Step 1 would be a limited characterization of the East Canyon Area to support site infrastructure improvements to be carried out in 2024, including construction of the new Security Building and GTCC Waste Storage Facility. The East Canyon Area would remain an operating industrial area subject to at least one Part 72 NRC License (related to ongoing ISFSI and GTCC Waste Storage Facility operations). As such, the site characterization and any required remediation in this area would focus on management of soils disturbed by infrastructure construction activities and protection of future site occupants.

Step 2 would be initiated in 2024 (after the shutdown of Unit 1) to determine the areas and extent of chemical and radiological contamination at the DCPP site and its structures, including all sumps, drains, and pits and any accumulated debris, prior to removal and shipment for off-site disposal. This study cannot be initiated sooner as there is a possibility of soil contamination occurring during DCPP operations, which would alter the baseline established by the SCS.

From a radiological perspective, the HSA determined that significant gaps in historical and current information, and sampling data, limit the ability to present a comprehensive or conclusive understanding of the radiological status of several of the potentially impacted structures and open land areas. As a result, additional site characterization is required. Both the HSA and the preliminary DCPP Site Characterization Plan were developed in accordance with standards established in the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM) (NRC, 2000 and NRC 2020a). As required by MARSSIM, the HSA:

- Identified potential, likely, or known sources of radioactive material and radioactive contamination based on existing or derived information
- Identified sites that need further action as opposed to those posing no threat to human health
- Provided an assessment for the likelihood of contaminant migration
- Provided information useful to scoping and characterization surveys
- Provided an initial classification of the site or survey units as impacted or non-impacted.

During the HSA process, information was collected to categorize the site or areas within the site as impacted or non-impacted and to make preliminary site classification assessments. If an area is impacted, MARSSIM provides criteria to classify potentially radiologically contaminated areas according to their level of risk or hazard. Class 1 areas, prior to remediation, are impacted areas with concentrations of residual radioactivity that likely exceed regulatory limits. Class 2 areas are impacted areas where concentrations of residual activity that exceed the limits are not expected. Class 3 areas are impacted areas that have a low probability of containing areas with residual radioactivity. Detailed definitions are found in MARSSIM (NRC, 2000).

The results of the HSA relevant to radiological contamination and hazards at DCPP site are summarized in Table 4.10-3. The table also provides information about areas that have been impacted and PG&E's preliminary MARSSIM classification; which structures are to be removed or are involved (buildings, concrete, pavement, or tanks); and whether sediment, air emissions, wells, or surface water (e.g., Diablo Creek) are present or involved.

Buildings and structures categorized as non-impacted in Tables 4.10-2 and 4.10-3 which are scheduled for demolition are considered non-radiological decommissioning waste material (i.e., not contaminated with radiological material).

The HSA provided a preliminary assessment for multiple MARSSIM Class 1 and 3 areas, although it did not identify what the proposed release criteria would be. The release criteria are known as Derived Concentration Guideline Levels (DCGLs): according to PG&E (PG&E, 2021d), DCGLs would be developed for a Resident Farmer scenario. DCGLs are an integral part of the site classification process, and the process for developing them has not yet been completed. DCGLs would be developed as part of a final Site Characterization Plan to be prepared prior to the initiation of Building Demolition activities. NRC would conduct a review of the DCGLs and require adjustments if needed (NRC, 2022a). The final Site Characterization Plan would also include plans for sample collection for characterization and for closure of the data gaps identified in the HSA. Numerous radiological surveys remain to be performed, particularly in areas that cannot be accessed until reactor operations are shutdown and other buildings and SSCs are removed.

The HSA did not identify any MARSSIM Class 2 survey units. Examples of areas that might be classified as Class 2 for the final status survey are found in MARSSIM (NRC, 2000, p. 2-5) and include: (1) locations where radioactive materials were present in an unsealed form, (2) potentially contaminated transport routes, (3) areas downwind from stack release points, (4) upper walls and ceilings of buildings or rooms subjected to airborne radioactivity, (5) areas handling low concentrations of radioactive materials, and (6) areas on the perimeter of former contamination control areas. The Learning Center/Maintenance Shop (see Figure 2-8, Building 119) Rooms 123 and 239, located within the Owner Controlled Area, and the Intake Area, are examples of areas that are currently identified as Class 3 that could ultimately become Class 2 upon survey and DCGL establishment.

Because PG&E's preliminary assessments are incomplete, and because conditions in the field may change from on-going reactor related operations, the planned future Site Characterization Study would provide supplementary data to update the preliminary classifications. Decommissioning activities may also change the environment enough to require a different classification from the preliminary ones. The radiological characterization activities described in the Site Characterization Study would be conducted in accordance with MARSSIM with physical sampling and analysis after Units 1 and 2 are shut down (PG&E, 2022a).

Table 4.10-4 identifies the potential radiologically impacted areas (i.e., areas that likely are, or could be radiologically contaminated) at the DCPP site and the anticipated Radionuclides of Concern (ROCs) based on current knowledge. The Project Description (Sections 2.3.8 through 2.3.12) contains summary descriptions of the methods and techniques to be utilized. Most of the methods and techniques are industry standard measures utilized on numerous nuclear reactor decommissioning projects in the past several decades.[24] However, where available and appropriate, innovative newer technologies may be employed if shown to improve the effectiveness and efficiency of decontamination technologies or decrease the risks to workers and the public.

[24] NRC consensus standards are identified on their website site: https://www.nrc.gov/about-nrc/regulatory/standards-dev/consensus.html. Details on industry decommissioning practices may be found on the NRC decommissioning lessons learned website: https://www.nrc.gov/waste/decommissioning/lessons-learned.html. The website refers to additional references and the Nuclear Energy Institute regarding potential lessons learned from past decommissioning actions: https://www.nrc.gov/docs/ML0604/ML060470473.pdf.

Table 4.10-3. Results of DCPP HSA[1]

Study Areas	Impacted	MARSSIM Class	To Be Removed	Buildings	Storage Tanks	Soil	Concrete	Pavement	Sediment	Air Effluent	Wells	Creek
North Owner Controlled Area (NOCA)												
Old Steam Generator Storage Facility (OSGSF)	Yes	3				X		X	X			X
Waste Holding and Treatment (WHAT) System Facility	Yes		X	X	X			X				X
Independent Spent Fuel Storage Installation (ISFSI) and the GTCC Waste Storage Facility	Yes	To remain until transfer of high-level wastes[3]										
Raw Water System, Switchyards, Secondary FLEX Storage Area and Outbuildings	No											
Tri-Bar Flats Area, Scaffold Laydown Area and Spoils Area	Yes	3				X	X		X			X
Open Land Areas	Yes	3										X
South Owner Controlled Area (SOCA)												
Parking Lot 1 and Vicinity	Yes	3				X	X					
Warehouse B (Building 113) at radioactive material storage area & building exterior	Yes		X				X					
Parking Lots 6, 7, 8, and Roadways	Yes	3		X		X	X	X				
Unpaved Open Land Areas	Yes	3				X						
West Owner Controlled Area WOCA)												
Area 10 – Parking Lot 10	Yes	3	X			X				X		
Training and Maintentance Shop Buildings, Rooms 123 & 239, building exterior, Parking Lots 2/4a/4b/5	Yes	3				X	X	X				
Intake Area	Yes	3				X	X	X		X		
Diablo Canyon Creek Area	Yes	3										
Discharge Cove Area (DCA)	Yes	3										
North Protected Area (NPA)												
Warehouse A and Adjacent Buildings	Yes	1 for soil	X	X		X						
115-Foot Elevation Radiological Control Area	Yes	1 for soil	X			X						
North and South Pavement Areas	Yes	3				X	X	X				

Table 4.10-3. Results of DCPP HSA[1]

Study Areas	Impacted	MARSSIM Class	To Be Removed	Buildings	Storage Tanks	Soil	Concrete	Pavement	Sediment	Air Effluent	Wells	Creek
Unit 1 and 2 Condensate Polishing System Sumps	Yes		X									
Monitoring Wells and Building 102	Yes										X	
West Paved Area	Yes	1	X			X	X					
South Protected Area (SPA)												
Administration, Security, Liquid Storage, and Temporary Office Buildings	Yes	1	X	X		X						
DCPP Main Warehouse	Yes	1	X	X								
Cold Machine Shop	Yes	1	X	X		X						
Open Land Area	Yes	1				X						
Power Block Area (PBA)												
Unit 1 & Unit 2 Containment Buildings	Yes	1	X	X								
Unit 1 and Unit 2 Fuel Handling Buildings	Yes	1	X	X								
Auxiliary Building	Yes	1	X	X								
Turbine Building	Yes	1	X	X								
North Site Area (NSA)	No											
South Site Area (SSA) [2]	No											

Source: PG&E, 2018b – Table 7.1-1; PG&E, 2022a; PG&E, 2021c – Table 3.8-2.
Acronyms: NOCA = North Owner Controlled Area; OSGSF = Old Steam Generator Storage Facility (OSGSF); WHAT = Waste Holding and Treatment; GTCC = Grater than Class C; ISFSI = Independent Spent Fuel Storage Installation, SOCA = South Owner Controlled Area; WOCA = West Owner Controlled Area; DCA = Discharge Cove Area; NPA = North Protected Area; SPA = South Protected Area; PBA = Power Block Area.
[1] An "X" indicates the presence or involvement of this item
[2] Considered by HSA as non-impacted but part is down wind of release stack
[3] Transfer of fuel is not part of the Proposed Project and won't occur until a repository has been constructed by the federal government or a CISF is authorized/approved.

Table 4.10-4. Summary of Potentially Radiologically Impacted Areas with ROCs

Study Area	Location Within Area	Classification	Potential Radionuclides of Concern[1]
NOCA	Old Steam Generator Storage Facility	Impacted	H-3, Co-60, Cs-137, Cs-134, Sr-90, Ni-63, Fe-55, Tc-99
	Waste Holding and Treatment (WHAT) System Facility	Impacted	Co-60, Cs-134, Cs-137, H-3, Fe-55, Ni-63, Sr-90, Tc-99
	Independent Spent Fuel Storage Installation	Impacted	To remain until DOE accepts waste[2]
	Raw Water System, Switchyards, Secondary FLEX Storage Area and Outbuildings	Non-impacted	Not applicable
	Tri-Bar Flats Area, Scaffold Laydown Area and Spoils Area	Impacted	Co-60, Cs-134, Cs-137, H-3, Fe-55, Ni-63, Sr-90, Tc-99
	Open Land Areas	Impacted	Co-60, Cs-134, Cs-137, H-3, Fe-55, Ni-63, Sr-90, Tc-99
SOCA	Parking Lot 1 and Vicinity	Impacted	H-3, C-14, Sr-90. Ni-63, Co-60, Cs-137
	Warehouse B (Building 113)		
	● Interior radioactive material storage	Impacted	H-3, C-14, Sr-90. Ni-63, Cs-137
	● Remaining building interior	Non-impacted	Not applicable
	● Building exterior	Impacted	H-3, C-14, Co-60
	Parking Lots 6, 7, 8, and Roadways	Impacted	H-3, C-14, Sr-90. Ni-63, Co-60, Cs-137
	Unpaved Open Land Areas	Impacted	H-3, C-14, Co-60
WOCA	Area 10 – Parking Lot 3	Impacted	H-3, C-14, Sr-90. Ni-63, Co-60, Cs-137
	Learning Center/Maintenance Shop (Building 119):		
	● Rooms 123 and 239	Impacted	Radioactive check sources[3]: Eu-152, Eu-154, Cs-137, Co-60, Ba-133, Sr/Y-90, H-3, C-14, Th-230
	● Remaining Building Interior	Non-impacted	Not applicable
	● Building Exterior	Impacted	H-3, C-14, Co-60
	Parking Lots 2/4a/4b/5	Impacted	H-3, C-14, Co-60
	Intake Area	Impacted	H-3, C-14, Co-60
	Diablo Canyon Creek Area	Impacted	H-3, C-14, Sr-90, Ni-63, Co-60, Cs-137
DCA	Unit 1 and Unit 2 Discharge Structure	Impacted	Co-60, Sb-125, Cs-134, Cs-137, H-3, C-14, Sr-90
NPA	Warehouse A	Impacted	Co-60, Cs-134, Cs-137, H-3, Fe-55, Ni-63, Sr-90, Tc-99
	115-Foot Elevation Radiologically Controlled Area (RCA)	Impacted	Co-60, Cs-134, Cs-137, H-3, Fe-55, Ni-63, Sr-90, Tc-99
	Pavement Areas	Impacted	Co-60, Cs-134, Cs-137, H-3, Fe-55, Ni-63, Sr-90, Tc-99
	Unit 1 and 2 Condensate Polishing System Sumps	Impacted	Co-60, Cs-134, Cs-137, H-3, Fe-55, Ni-63, Sr-90, Tc-99
	Groundwater Monitoring Wells	Impacted	H-3

Table 4.10-4. Summary of Potentially Radiologically Impacted Areas with ROCs

Study Area	Location Within Area	Classification	Potential Radionuclides of Concern[1]
SPA	Administration, Security, Liquid Storage, and Temporary Office Buildings	Impacted	H-3, C-14, Co-60
	DCPP Main Warehouse	Impacted	H-3, C-14, Co-60
	Cold Machine Shop	Impacted	Co-60, Cs-134, Cs-137, H-3, Fe-55, Ni-63, Sr-90, Tc-99
	Open Land Area	Impacted	Co-60, Cs-134, Cs-137, H-3, Fe-55, Ni-63, Sr-90, Tc-99
Power Block Area [4]	Unit 1 and Unit 2 Containment Buildings	Impacted	No specific radionuclide identified.
	Unit 1 and Unit 2 Fuel Handling Buildings	Impacted	No specific radionuclide identified.
	Auxiliary Building	Impacted	No specific radionuclide identified.
	Turbine Building	Impacted	No specific radionuclide identified.
North Site Area [4]	All	Non-impacted	Not included in source table; not applicable.
South Site Area [4]	All	Non-impacted	Not included in source table; the southeast section might be in emissions pathway.

Source: PG&E, 2018b – Table 7.1-1; PG&E, 2022a; PG&E, 2021c – Table 3.8-2.
Acronyms: NOCA = North Owner Controlled Area; WHAT = Waste Holding and Treatment; SOCA = South Owner Controlled Area; WOCA = West Owner Controlled Area; DCA = Discharge Cove Area; NPA = North Protected Area; SPA = South Protected Area.
[1] Where Radionuclides of Concern are abbreviated by atomic symbol for each element as follows: Barium (Ba), Carbon(C), Cobalt (Co), Cesium (Cs), Europium (Eu), Iron (Fe), Tritium (H-3), Nickel (Ni), Technetium (Tc), Strontium (Sr), Yttrium (Y).
[2] Transfer of SNF offsite is not part of the Proposed Project and would not occur until a repository has been constructed by the federal government or a CISF is authorized/approved.
[3] Radioactive check sources were used to calibrate radiation monitoring equipment in these rooms and should not be present. The FSS would assure they have been removed.
[4] Areas were not listed in the PG&E CDP application package Table 3.8-2; added here for completeness.

4.10.1.2.2 Groundwater

In addition to the potentially contaminated buildings, structures, soils, and other materials identified in Tables 4.10-1 and 4.10-2, contamination of groundwater at DCPP, either during reactor operations or during decommissioning, is possible. This discussion overlaps, in part, with Section 4.11.1, *Surface Water and Groundwater Quality*. A Groundwater Protection Program is active at DCPP in accordance with the "Industry Groundwater Protection Initiative, Final Guidance Document" prepared by the Nuclear Energy Institute (NEI) and referred to as the NEI Groundwater Protection Initiative (NEI, 2019). This program is directed by procedures and would continue during decommissioning (PG&E, 2022a). Licensees that have implemented a groundwater monitoring program consistent with the NEI Groundwater Protection Initiative are considered by the NRC to have an adequate program for the purposes of groundwater protection (NRC, 2011).

Tritium monitoring in groundwater at DCPP began in 2006 as part of the Radiological Environmental Monitoring Program (PG&E, 2007a). Groundwater is sampled at several on-site wells, including Well #2. Results of the Radiological Environmental Monitoring Program are submitted to local, state, and federal agencies on an annual basis via the Annual Radiological Environmental Operating Report.

From 2006 through 2008, tritium was found to "wash-out" during rain events due to gaseous releases from the plant vents (direct rain collection and building downspouts). Tritium was found to concentrate in stagnant water due to diffusion in air from the plant vents and in condensation of air moisture in proximity to the DCPP vents. Subsequent monitoring consistently measured tritium levels in excess of the Lower Limit of Detection (400 picocuries per liter) within French drains beneath the DCPP power block (PG&E, 2020a). The low levels and the location of the tritium found in groundwater at DCPP do not indicate a leak from the spent fuel pools (SFPs) or any other plant equipment source of tritium. Instead, the low levels are consistent with minor tritium "wash-out" during rain events. The levels of tritium were all below the USEPA drinking water standard of 20,000 picocuries per liter (PG&E, 2007a).

PG&E DCPP Radiation Protection personnel undertook a review of the hydrogeologic environment and the potential threat to drinking water supplies. The only groundwater that is used for drinking water at the DCPP site is pumped from Well #2, located east of the DCPP site at a ground elevation of 333 feet above mean sea level (MSL). This is considerably higher than the ground elevation of the power blocks at 85 feet above MSL. Well #2 draws from an isolated source specific to Diablo Canyon that is replenished by flows through the alluvium. Potential releases of tritiated water from DCPP cannot lead to any drinking water source due to overall site hydrogeological characteristics, and the higher elevation of the aquifer replenishing the location tapped by the deep water well. A comparison of the static water level and the pumping water level of Well #2 and the power block wells showed that Well #2 could not draw water from the power block area, even during intensive pumping during drought conditions (ENTRIX, 2010). The DCPP Radiation Protection analysis conducted by PG&E concluded that DCPP site releases of tritiated water, should they occur, would not affect drinking water sources because there is no groundwater under the DCPP site that would lead to sources of drinking water. No plant-related tritium has been detected in drinking water. This groundwater flow discharges into the Pacific Ocean (PG&E, 2007a). The Annual Radiological Environmental Operating Report (AREOR) for the

years 2018 through 2020 (PG&E, 2019d; PG&E, 2020a; PG&E, 2021a) were reviewed for this EIR and these reports indicate no significant contaminant discharges into the Pacific Ocean.

Based on the above analyses and environmental staff evaluation, it was concluded that there is no potential for waters originating at the DCPP site to contaminate domestic water supplies regulated, owned, managed, or certified by state and local governmental bodies.

The PSDAR, Revision 1 notes that "Active groundwater remediation is not anticipated for DCPP, as groundwater monitoring has not identified tritium at the well [Well#2] that is used for a drinking water source (located up DC [Diablo Creek], away from the power block)," The PSDAR, Revision 1 continues: "Neither the monitoring results of the groundwater protection program nor events noted in the 10 CFR 50.75(g) files indicate the presence of long-lived radionuclides in sufficient concentrations following remediation as needed to preclude unrestricted release." (PG&E, 2022a).

PG&E plans to continue to maintain the existing radiological decommissioning records program related to groundwater monitoring required by 10 CFR 50.75(g) (PG&E, 2022a).

4.10.1.2.3 Waste Management Activities

A major component of the decommissioning work scope for the Proposed Project involves the packaging, transportation, and disposal of contaminated/activated equipment, piping, concrete, and in some cases soil. Demolition methods and handling techniques are selected to minimize cross-contamination of clean materials with those required to be disposed of as wastes. To minimize cross-contamination with clean materials, the clean materials are removed first prior to building demolition if it is to be reused, recycled, or repurposed and segregated from the transportation and storage areas used for radiological or hazardous/regulated materials. Any mixed wastes (hazardous and radioactive) identified during decommissioning would be managed in accordance with applicable federal and state regulations. Mixed wastes from DCPP would be transported by licensed transporters and shipped to authorized and licensed facilities (PG&E, 2022a). Of note at the state level, Executive Order No. D-62-02 issued by Governor Davis in 2002 (California Office of Governor, 2002) applies to the Proposed Project as it:

- Directed the nine California Regional Water Quality Control Boards (RWQCBs) to impose a moratorium on the disposal of decommissioning waste materials into Class III and unclassified waste management units until the California Department of Health Services completed an assessment of the public health and environmental safety risks associated with the disposal of decommissioned materials and until its regulations setting dose standards for decommissioning take effect. A Class III landfill accepts non-hazardous resources such as household, commercial, and industrial waste, resulting from construction, remodeling, repair, and demolition operations. A Class III landfill must have a solid waste facility permit from the State of California and be regulated by an Enforcement Agency (Cal. Code Regs. Tit. 27, § 20260 - SWRCB - Class III: Landfills for Nonhazardous Solid Waste. (C15: s2533)
- Required the moratorium be implemented via cleanup and abatement orders issued by each RWQCB: the Central Coast RWQCB issued Cleanup and Abatement Order No. R3-2002-0130 on October 11, 2002, which places a moratorium on the acceptance of "Decommissioned Materials" by landfills (RWQCB, 2002).

As such, radiological waste from decommissioning cannot be disposed of within California. Radiological waste from the Proposed Project can be accepted at three licensed facilities for disposal in the United States: Clive Disposal Facility (currently operated by Energy*Solutions*) in Clive, Utah; Waste Control Specialists, LLC in Andrews, Texas; and US Ecology in Grand View, Idaho. Each of these facilities can receive different types of radiological materials and a waste management plan has been developed by PG&E to incorporate the most cost-effective disposal strategy, consistent with regulatory requirements and disposal/processing options for each waste type (PG&E, 2022a). PG&E's disposal plans for Class A, B, and C waste associated with the Proposed Project are only partially provided due to security redactions in Table 4-3 of the Site-Specific Decommissioning Cost Estimate (PG&E, 2019c).

Based on recent advancements reported by PG&E in the development and licensing of Type B transportation casks, which are required to support transport of these waste materials, it is expected that on-site storage of waste materials would not be required for the purpose of allowing for radioactive decay. However, it is expected that transportation cycle delays may occur. Therefore, it is anticipated that Class A, B, and C waste materials generated during decommissioning could be stored on site for between 1 week to 1 year (PG&E, 2021d). Important Proposed Project activities associated with transporting hazardous material include:

- Waste would be hauled by truck to the Santa Maria Valley Railyard Facility (SMVR) site located in Santa Barbara County (SMVR-SB). Waste would then be transported out-of-state via rail for disposal. Some material would be shipped by truck directly to the disposal facilities due to either the size, waste type, packaging needs, or if the disposal facility does not have a rail spur. Examples of material to be shipped directly by truck include large components, some reactor pressure vessel (RPV) and internals waste, and other regulated material.
- Rail and truck transport would be utilized during the transport of highly regulated materials, such as Class B and C Low-Level Radioactive Waste (LLRW), and during Project timeframes when not enough waste is generated to support large volume barge shipments.
- Barges would be loaded from the Intake Structure area for waste transportation using a mobile crane.

DCPP has gaseous and solid waste processing systems that are designed to collect and process radioactive waste so that both on-site and off-site exposures are kept within the dose design objectives of 10 CFR Part 50, Appendix I, and within the limits as defined by 10 CFR Parts 20 and 100. DCPP intends for these waste treatment processes to continue during decommissioning for as long as needed (PG&E, 2021c). DCPP would continue to have gaseous and liquid effluents from maintaining SFP operations until SNF is transferred to the ISFSI, and the wet storage systems are decommissioned. The SFPs are in the fuel handling building which encloses the two fuel handling areas of Unit 1 and Unit 2 and is a shared structure (PG&E, 2019b). The radioactive waste treatment effluent processes are discussed in Section 2.3.20, *Water Management, including Management of the Seawater Reverse Osmosis Facility and Liquid Radioactive Waste*.

4.10.1.2.4 Radioactive Waste Liquid Treatment Processes

The water management approach for decommissioning is based on the National Pollution Discharge Elimination Permit (NPDES) Permit CAA0003751 issued for DCPP power operations.

PG&E plans to use similar areas for ocean intake and wastewater discharges as used for existing DCPP operations (see Figure 2-32).

Immediately following shutdown, cooling for the SNF in the SFPs would continue. In addition, freshwater production and wastewater disposal would need to continue to support decommissioning activities. Existing plant equipment would be used as much as practical while the site transitions into decommissioning. During this time, PG&E plans to discharge the wastewater inventories with appropriate dilution that are remaining from plant operations.

PG&E plans to use water sprayers for dust suppression during Building Demolition activities, as well as for contamination control (PG&E, 2021d). Any runoff from these dust suppression measures would be captured by a groundwater collection and treatment system (GWTS) prior to release. The GWTS would be developed in the early stages of decommissioning and utilized to collect and process water accumulated in open excavations from direct rainfall and groundwater intrusion utilizing a combination of settling ponds and tanks or filtration equipment. As described in Section 2.3.9, *Building Demolition,* and Section 2.3.17, *Stormwater Management*, treated water would be discharged according to allowable discharge concentrations according to the Central Coast Regional Water Quality Control Board. PG&E would also apply for a Construction Stormwater General Permit and prepare a Stormwater Pollution Prevention Plan prior to start of construction activities to address the requirements for control of fugitive dust emissions from the DCPP site.

Inventories of liquid radiological waste (LRW) would be processed during decommissioning (see Section 2.3.20 *Water Management, including Management of the Seawater Reverse Osmosis Facility and Liquid Radioactive Waste*). In the early stages of decommissioning, much of this inventory would be collected, processed, and monitored by the existing plant equipment. While the auxiliary saltwater pumps are in operation, systems containing LRW would be drained to the LRW processing system, and ultimately flow into the ocean. The levels of radioactive material that can be filtered out would be below the levels that have been approved to be discharged into the ocean during plant operations. As tritium cannot be removed through conventional treatment methods, the auxiliary saltwater system would be used to dilute the tritium concentration in the effluent prior to discharge.

4.10.1.2.5 Radioactive Waste Gaseous Effluent Treatment Processes

During operations, DCPP ventilation systems discharge through the plant vent stack, located on top of the containment building. The plant vent stack is the primary source of gaseous effluents, which exposes the exterior surfaces of plant buildings, including the concrete containment building, to radioactive gasses. The primary radionuclide of concern is tritium and to a lesser extent carbon-14 (C-14) which is not expected to washout or deposit on building surfaces as much. The extent of the tritium contamination on the exterior concrete surface of the containment building was not determined during the preparation of the HSA (PG&E, 2018c). There are two discharge points other than the plant vent stacks: (1) the exhaust vent from the primary chemistry lab and (2) the exhaust vent from the post-accident sampling system. The nearest "inhabited" structure is a small trailer used only by DCPP employees located about 1.93 kilometers (1.2 miles) northwest of the plant.

Information obtained during interviews with radiation protection staff at DCPP indicates that water from the Auxiliary Building roof gutters can contain high concentrations of tritium (approximately 800,000 pCi/liter) due to deposition from gaseous effluent on roof top surfaces. Roof top surfaces of the other buildings in the Power Block Area may have similar concentrations of tritium due to deposition from gaseous effluent (PG&E, 2018c).

All buildings in the South Protected Area are located close to the plant vent stacks where tritium and C-14 are/have been released. Condensate from air conditioning units associated with all the buildings in the area discharge directly to the ground. Radionuclides (tritium and C-14) entrained in the condensate would have been released to the ground (PG&E, 2018c). The DCPP 2020 Annual Radioactive Effluent Release Report indicates that a major contributor to gaseous tritium activity is evaporation from the SFPs and that doses associated with plant effluent releases were much less than the respective technical specification limits (PG&E, 2021b).

4.10.2 Regulatory Setting

4.10.2.1 Hazardous Materials

The primary federal and state laws, regulations, and policies that are applicable to the Proposed Project are summarized in Appendix C. See also Appendices G2 and G5, which provide information related to the regulation of packaging and transport of hazardous and radiological materials. Relevant regional and local laws, regulations, and policies are presented below.

State

California Environmental Protection Agency. The California Environmental Protection Agency (Cal-EPA) was created in 1991. It centralized California's environmental authority, consolidating the Air Resources Board, SWRCB, Department of Resources Recycling and Recovery (CalRecycle, formerly Integrated Waste Management Board), DTSC, Office of Environmental Health Hazard Assessment, and Department of Pesticide Regulation under one agency. These agencies were placed within the Cal-EPA and a cabinet-level advocate was established for the protection of human health and the environment and to ensure the coordinated deployment of State resources. Cal-EPA's mission is to restore, protect and enhance the environment, and to ensure public health, environmental quality, and economic vitality. The Department of Pesticide Regulation, DTSC, CalRecycle, and SWRCB regulate hazardous materials and hazardous waste that have the potential to cause soil, water, and groundwater contamination, and their missions are summarized below.

- **Department of Toxic Substances Control.** The DTSC mission is to restore, protect, and enhance the environment, and to ensure public health, environmental quality, and economic vitality by regulating hazardous waste, conducting and overseeing cleanups, and developing and promoting pollution prevention.
- **CalRecycle.** The mission of the CalRecycle is to protect the public health and safety and the environment through waste prevention, waste diversion, and safe waste processing and disposal.

- **State Water Resources Control Board.** The SWRCB mission is to preserve and enhance the quality of California's water resources and ensure their proper allocation and efficient use for the benefit of present and future generations.

California Office of Emergency Services. To protect the public health and safety and the environment, the California Office of Emergency Services establishes and manages statewide standards for business and area plans relating to the handling and release or threatened release of hazardous materials. Basic information on the location, type, quantity, and the health risks of hazardous materials handled, used, stored, or disposed of in the State, which could be accidentally released into the environment, needs to be made available to firefighters, health officials, planners, public safety officers, health care providers, regulatory agencies, and other interested parties. The information provided by businesses and area plans is necessary to prevent or mitigate the damage to the health and safety of persons and the environment from the release or threatened release of hazardous materials into the workplace and environment. These regulations are covered under Chapter 6.95 of the California Health and Safety Code Article 1 – Hazardous Materials Release Response and Inventory Program (Sections 25500-25520), and Article 2 – Hazardous Materials Management (Sections 25531-25543.3).

CCR Title 19, Public Safety, Division 2, Office of Emergency Services, Chapter 4 – Hazardous Material Release Reporting, Inventory, And Response Plans, Article 4 (Minimum Standards for Business Plans) establishes minimum statewide standards for Hazardous Materials Business Plans. These plans shall include the following: (1) a hazardous material inventory in accordance with Sections 2729.2 - 2729.7, (2) emergency response plans and procedures in accordance with Section 2731, and (3) training program information in accordance with Section 2732. Business plans contain basic information on the location, type, quantity, and health risks of hazardous materials stored, used, or disposed of in the State. Each business shall prepare a Hazardous Materials Business Plan if that business uses, handles, or stores a hazardous material or an extremely hazardous material in quantities greater than or equal to the following:

- 500 pounds of a solid substance,
- 55 gallons of a liquid,
- 200 cubic feet of compressed gas,
- hazardous compressed gas in any amount, and/or
- hazardous waste in any quantity.

California Occupational Safety and Health Administration. The California Occupational Safety and Health Administration (Cal-OSHA) is the primary agency responsible for worker safety in the handling and use of chemicals in the workplace. Cal-OSHA standards are generally more stringent than federal regulations. The employer is required to monitor worker exposure to listed hazardous substances and notify workers of exposure (CCR Title 8 Sections 337-340). The regulations specify requirements for employee training, availability of safety equipment, accident-prevention programs, and hazardous substance exposure warnings.

CCR, Title 8, Chapter 4, Subchapter 7, Group 14 and 15, and Group 16, Articles 107, 109, and 110 sets forth the Permissible Exposure Limit, the exposure, inhalation or dermal permissible exposure limit for numerous chemicals. Included are chemicals, mixture of chemicals, or pathogens for which there is statistically significant evidence, based on at least one study conducted in

accordance with established scientific principles, that acute or chronic health effects may occur in exposed employees.

It is the responsibility of Cal-OSHA to ensure compliance with the provisions of the Hazard Communication Standard. California Labor Code Sections 6360 through 6399.7 and CCR Title 8 Sections 5191 and 5194 are intended to ensure that both employers and employees understand how to identify potentially hazardous substances in the workplace, understand the health hazards associated with these chemicals, and follow safe work practices. This is accomplished by preparation of a Hazard Communication Plan.

Office of Environmental Health Hazard Assessment. Proposition 65, the Safe Drinking Water and Toxic Enforcement Act of 1986, was enacted as a ballot initiative in November 1986. Proposition 65 was intended by its authors to protect California citizens and the State's drinking water sources from chemicals known to cause cancer, birth defects, or other reproductive harm, and to inform citizens about exposures to such chemicals. Proposition 65 requires the Governor to publish, at least annually, a list of chemicals known to the State to cause cancer or reproductive toxicity. The Office of Environmental Health Hazard Assessment has established safe harbor levels (levels of exposure that trigger the warning requirement) for some, but not all, listed chemicals. Businesses that cause exposures greater than the safe harbor level must provide Proposition 65 warnings.[25] If there is no safe harbor level for a chemical, businesses that knowingly expose individuals to that chemical would generally be required to provide a Proposition 65 warning, unless the business could show that risks of cancer or reproductive harm resulting from the exposure would be below levels specified in Proposition 65 and its accompanying regulations.

Local

County of San Luis Obispo

Safety Element, County General Plan. The Safety Element of the San Luis Obispo County General Plan (San Luis Obispo, 1999) has two main principles: to be ready for disaster, and to manage development to reduce risk. The Safety Element covers hazards related to flooding, geology, fire, hazardous materials, and other causes. The following programs and standards are directly relevant to the DCPP.

- Standard S-68: Review commercial projects which use, store, or transport hazardous materials to ensure necessary measures are taken to protect public health and safety.

Emergency Operations Plan (EOP). The EOP provides guidance, procedures, and County policies pertaining to emergency planning and response. It is not the intent of the EOP to supersede the response procedures or emergency response plans that have been prepared by other agencies, such as CAL FIRE or city fire departments. The EOP provides support for the agencies that have the primary responsibility for responding to an emergency incident. The EOP is primarily comprised of five emergency plans: (1) Earthquake Response Plan; (2) Hazardous Materials Emergency Response Plan; (3) Dam Failure Evacuation Plan; (4) Nuclear Power Plant Emergency Response Plan; and (5) Storm Emergency Plan.

[25] Safe harbor levels are available at https://oehha.ca.gov/proposition-65/general-info/current-proposition-65-no-significant-risk-levels-nsrls-maximu.

4.10.2.2 Radiological Materials

The primary federal and state laws, regulations, and policies that pertain to the Project are summarized in Appendix C. Those applicable to radiological materials are discussed below.

Federal

In 1959, Congress amended the Atomic Energy Act to reaffirm states' traditional role in the regulation of power generation while simultaneously asserting the Atomic Energy Commission's exclusive authority over radiological safety, providing that "Nothing in this section shall be construed to affect the authority of any state or local agency to regulate activities for purposes other than protection against radiation hazards" (42 US Code §2021(k)). The Energy Reorganization Act (1974) split the duties and authorities of the Atomic Energy Commission into the Energy Research and Development Administration, which was responsible for development and production of nuclear weapons, promotion of nuclear power, and other energy related programs, and the NRC was responsible for regulatory oversight of civilian nuclear energy programs. In 1977, the Energy Research and Development Administration was terminated, and its functions and responsibilities were transferred to US Department of Energy (DOE) by the Department of Energy Organization Act, P.L. 95-91, 91 Stat. 565 (1977). As a result, the NRC has since its founding had preemptive authority over all civilian nuclear programs including decommissioning activities and radiological safety (Garvey, 2011). Nevertheless, this EIR identifies applicable significance thresholds, assesses the Project's environmental impacts and their significance, and considers measures to avoid or substantially reduce any radiological effects found to be potentially significant.

The NRC's oversight also includes management and safe storage of SNF until it can feasibly be moved off site (10 CFR Part 72 Subpart K, §72.210 (NRC, 2001)). During decommissioning and until the DCPP NRC operating and SNF storage licenses are terminated, the NRC is also responsible for on-going inspection and monitoring of all liquid and airborne radiological releases at DCPP; any such releases must be maintained below the same radiological limits as when the plant was in operation (42 US Code, 2021).

In summary, the NRC is the lead federal agency responsible for oversight and safety related to radiological hazards and constituents, as well as review and approval of a LTP for the DCPP reactor operating licenses. The NRC's exclusive jurisdiction preempts states and state agencies from imposing any regulatory requirements related to radiation hazards or nuclear safety (see Section 1.2.1.2, *Federal Preemption*). The NRC may, and does, consult with other federal agencies as part of NRC submittals, such as the USEPA as part of the license termination process; and the US Fish and Wildlife Service (USFWS) regarding special status species, such as the federally threatened California red-legged frog present in Diablo Creek.

The primary NRC regulations regarding decommissioning are 10 CFR Part 50 Section 50.82, Termination of License (NRC, 1988a), and 10 CFR Part 20 Subpart E - Radiological Criteria for License Termination (NRC, 1997).

During decommissioning, DCPP would remain regulated by the NRC under some of the same regulations that apply while the nuclear plant is in operation. The regulations that apply to the Proposed Project in 10 CFR include, but are not limited to:

- Part 20 – Standards for Protection Against Radiation (NRC, 1991a; NRC, 1997)
- Part 50 – Domestic Licensing of Production and Utilization Facilities (NRC, 1988a)
- Part 51 – Environmental Protection Regulations For Domestic Licensing and Related Regulatory Functions (NRC, 1984)
- Part 72 – Licensing Requirements for the Independent Storage of Spent Nuclear Fuel, High Level Radioactive Waste, and Reactor-Related Greater Than Class C Waste (NRC, 2001)
- Part 73 – Physical Protection of Plants and Materials (NRC, 1979).

In support of the regulatory requirements during decommissioning and permanent shutdown, the NRC provides licensees with guidance for satisfying the regulations in regulatory guides and NUREGs (technical reports) that further demonstrate the thoroughness of the NRC's regulation of decommissioning. Some of the guidance documents include:

- Regulatory Guide 1.184 – Decommissioning of Nuclear Power Reactors (NRC, 2013a)
- Regulatory Guide 1.185 – Standard Format and Content for Post-Shutdown Decommissioning Activities Report (NRC, 2013b)
- Regulatory Guide 1.179 – Standard Format and Content for License Termination Plans for Nuclear Power Reactors (NRC, 2019)
- Regulatory Guide 1.191 Rev 1 – Fire Protection Program for Nuclear Power Plants During Decommissioning (NRC, 2021k)
- NUREG-1575 – Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM), Revision 1 (NRC, 2000)
- NUREG-0586 – Final Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities - Supplement 1 (NRC, 2002b)
- NUREG-2157 – Generic Environmental Impact Statement for Continued Storage of Spent Nuclear Fuel (NRC, 2014)
- NUREG-1757 Vol. 2 – Consolidated Decommissioning Guidance, Characterization, Survey, and Determination of Radiological Criteria, Rev. 2 (NRC, 2022a).

The NRC and the USEPA entered a Memorandum of Understanding (MOU) on October 9, 2002, on Consultation and Finality on Decommissioning and Decontamination of Contaminated Sites (NRC, 2002a). The MOU continues the 1983 USEPA policy that USEPA would defer Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) authority over NRC decommissioning sites, unless otherwise requested by the NRC. The MOU states that USEPA would defer completely to NRC authority without the need for consultation on sites undergoing decommissioning, except where any of the following three criteria are triggered.

- Groundwater contamination exceeds USEPA's Maximum Concentration Levels
- The site is proposed for restricted (10 CFR 20.1403) [or alternate (10 CFR Part 20.1404)] release

- Soil radionuclide levels exceed values in Table 1 of the MOU (NRC, 2002a).

Table 4.10-5 presents a summary of the NRC's authority over nuclear hazards and radiological materials as it applies to the characterization and disposal of wastes that would be generated during decommissioning of DCPP.

Table 4.10-5. NRC's Authority over Nuclear Hazards and Radiological Materials

Release of Property and Equipment
Following the industry practice described in NRC Inspection and Enforcement (I&E) Circular 81-07 (NRC, 1981) presumes compliance with Governor Executive Order No. D-62-02 (California Office of Governor, 2002), which established a moratorium on in-state disposal of decommissioning wastes in California. The Circular establishes operational detection levels below which the probability of any remaining, undetected contamination is negligible and can be disregarded when considering the practicality of detecting and controlling such potential contamination and the associated negligible radiation doses to the public. There cannot be any recycling of decommissioning material within California, regardless of the level of radioactivity (if any). NRC refers to NUREG-1757, Volume 2, for tables of screening criteria (concentrations) applicable to surface contamination of buildings and to surface soils (Tables H.1 and H.2) (NRC, 2022a).
Release of Potentially Contaminated Volumetric Material
NUREG-1757, Vol. 2 Revision 2 states that reactor licensees (10 CFR Part 50 licensees) may release equipment and building structure deconstruction and dismantlement materials in accordance with guidance in I&E Circular 81-07, Information Notice 85-92, and Information Notice 88-22 (NRC, 2022a). Volumetric material media could include subsurface soil, surface or subsurface water, biota, air, sewers, sediments, sewage sludge, internally contaminated equipment, or volumetric (versus surficial) building residual radioactivity. Information Notice 85-92 (NRC, 1985) supplements the guidance of I&E Circular 81-07 as it applies to surveys of solid waste materials before disposal from nuclear reactor facilities. In practice, no radioactive (licensed) material means no detectable radioactive material." The Notice continues to say, "Careful surveys, using methods (equipment and techniques) for detecting very low levels of radioactivity, are made of materials that may be contaminated and that are to be disposed of as clean waste. These survey methods should provide licensees with reasonable assurance that licensed material is not being released from their control." The current governing regulation for purposes of radiological waste disposal is 10 CFR 20 Subpart K – Waste Disposal, 10 CFR 20.2001(a)(1)). The NRC's regulations in 10 CFR 20.2001, "General Requirements," of 10 CFR Part 20, Subpart K, "Waste Disposal," identify the methods by which a licensee may lawfully and safely dispose of its licensed radioactive waste. One such method, set forth in 10 CFR 20.2002, "Method for obtaining approval of proposed disposal procedures," allows "alternative disposal" authorizations. Section 20.2002 is a general provision that allows for alternative disposal methods that are different from those already defined in the regulations, provided that doses are maintained as low as is reasonably achievable (ALARA) and within the dose limits in 10 CFR Part 20. Information Notice 88-22 (NRC, 1988b) instructs reactor licensees to apply in accordance with the provisions of 10 CFR Part 20.302 (current provision 10 CFR Part 20.2002) to dispose of sewage sludge containing very low levels of licensed radioactive material in a manner not otherwise authorized in the regulations. Applications for approval of such disposal may be made to the NRC or Agreement State, such

Table 4.10-5. NRC's Authority over Nuclear Hazards and Radiological Materials

as California.[26] Surveys are required before disposing of sewage treatment sludge, to determine if the sludge is contaminated. Gamma-ray spectrometry is recommended on representative samples of the sludge under conditions that provide a Lower Limit of Detection (LLD) appropriate to measurements of environmental samples. Such measurements make it possible to distinguish licensed material from other radioactive materials (natural radioactive materials and worldwide fallout) that may be present in the sludge.

License Termination Rule (LTR)

A site will be considered acceptable for unrestricted use if the residual radioactivity that is distinguishable from background radiation results in a total effective dose equivalent to an average member of the critical group (i.e., group of individuals reasonably expected to receive the greatest exposure to residual radioactivity for any applicable set of circumstances [see 10 CFR 20.1003]) that does not exceed 25 millirem per year, including from groundwater sources of drinking water, and the residual radioactivity is reduced to levels that are ALARA. (10 CFR Part 20). The LTR applies to building structures remaining after decommissioning and does not apply to releases of equipment from the facility as part of final status surveys supporting license termination. If licensees elect to dismantle building structures and dispose of the associated materials off site (in accordance with applicable regulatory requirements), rather than leave the building structures in place (for unrestricted use), the LTR does not apply to the associated materials moved off site prior to license termination (NRC, 2022a).

NRC ensures compliance with the LTR through an ongoing inspection program that remains in place during decommissioning until the NRC license is terminated. Inspections cover Radiation Protection, Emergency Planning, Security, Engineering, and Operations all areas included in the licensed area, and decommissioning activities. The results of NRC inspections and any associated findings, except for security issues, are published in inspection reports that are publicly available (NRC, 2021a).

Occupational Radiation Exposure

Occupational doses are limited for an individual worker to a maximum of 5 rem per year (Total Effective Dose Equivalent) with separate limits for dose to various tissues and organs per 10 CFR Part 20 (NRC, 1991a).[27]

Work on the Proposed Project must minimize occupational radiation exposure, and prevent the uncontrolled spread of radioactive materials or release of radiation to areas where a member of the public could be affected. DCPP has an established Radiation Work Permit system and worker training for this control (PG&E, 2007b). Radiation Work Permits provide a mechanism for notifi-

[26] The NRC can relinquish its authority over certain radioactive materials to state governments that sign agreements with the agency. As of September 2020, there are 39 Agreement States that issue licenses, conduct inspections and enforce safety regulations over the industrial, medical, and academic uses of radioactive material. The NRC maintains regulatory authority over all commercial nuclear power reactors, research reactors and nuclear fuel cycle facilities, even those located in Agreement States.

[27] The abbreviation "rem" stands for Roentgen Equivalent Man, which is a standard unit used to measure the dose equivalent (or effective dose), which combines the amount of energy (from any type of ionizing radiation that is deposited in human tissue), along with the medical effects of the given type of radiation. For beta and gamma radiation, the dose equivalent is the same as the absorbed dose. By contrast, the dose equivalent is larger than the absorbed dose for alpha and neutron radiation, because these types of radiation are more damaging to the human body. The dose equivalent (in rems) is equal to the absorbed dose (in rads) multiplied by a quality factor representative of the type of radiation encountered (see CFR Title 10, Section 20.1004). Quantities measured in rem are designed to represent the stochastic (i.e., probabilistic) distribution of biological effects of ionizing radiation, primarily radiation-induced cancer.

cation, planning, and approval of work involving radiation exposure or use of radioactive material during a specific time period. Radiation Work Permits also identify the radiological conditions associated with the job and prescribe the limits, monitoring requirements, and protective measures applicable to the work in progress. The information on the Radiation Work Permit is made available to the worker for reference prior to the radiological work activity (NRC, 2006).

PG&E plans to chemically decontaminate specific portions of the nuclear steam supply system which would reduce the residual quantity of radioactive material therein. This would reduce the potential for decommissioning personnel to receive high doses of radiological exposure from fixed contamination typically associated with corrosion or oxide products on inside surfaces of metal components and piping (PG&E, 2022a).

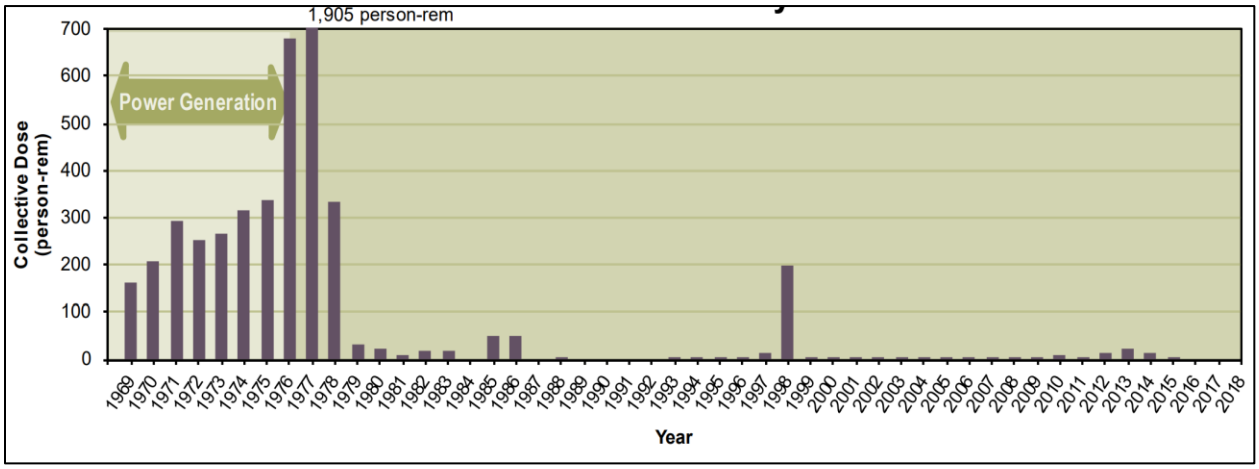
Further, the NRC's "as low as is reasonably achievable" (ALARA) program (NRC, 2006; NRC, 2022a) requires the reduction of radiation exposure to ALARA for site-wide activities including both decommissioning and routine operational activities (e.g., SFPs and approved ISFSI). ALARA program elements include job planning; dose controls and administrative limits; use of temporary shielding; pre-job briefings; dose estimates to identify priorities, establish goals, and monitor performance; and use of mockups and training for specific high-dose jobs.

PG&E evaluated DCPP operational dose data and compared it to that of other pressurized water reactors and established that DCPP operating collective dose has been below the US average Further, the average individual worker dose at DCPP is well below the average worker dose during operations for the decommissioning sites considered in the GEIS (PG&E, 2022a).

The decommissioning sites evaluated in the GEIS include sites that have transitioned directly into decontamination/dismantlement as rapidly after reactor shutdown as possible to achieve termination of the nuclear license and DCPP's current decommissioning plans would utilize methods and procedures for decontamination, dismantlement, and waste processing activities similar to those considered by NRC (NRC, 2002b). As a result, DCPP's decommissioning collective dose estimated by PG&E is expected to be bounded by typical decommissioning of US pressurized water reactors (PG&E, 2022a). The NRC considers the dose from SNF management and ISFSI operation as outside the scope of decommissioning (NRC, 2002b).

As an example of PG&E's specific experience in decommissioning, Figure 4.10-2 presents the exposure during both operating years and decommissioning of its Humboldt Bay Power Plant Unit 3. Humboldt Bay was one of the case studies considered in the NRC's decommissioning GEIS, NUREG-0586 (NRC, 2002b). The doses presented show a substantial drop in exposure following the formal shutdown in 1983. Humboldt Bay's nuclear unit (Unit 3) ceased generating power in 1976, but the decommissioning process did not begin until December 2008, after the SNF was transferred to the site's ISFSI (NRC, 2022b). Although decommissioning activities at DCPP are expected to start immediately after operations cease, post shutdown doses at DCPP are also expected to be lower than operating doses.

Figure 4.10-2. Dose During Power and Decommissioning Activities at Humboldt Bay



Source: NRC, 2020b – NUREG-0713, Attachment E.

Public Exposure Limits

The NRC and USEPA have established three layers (i.e., increasing levels) of radiation protection limits to protect the public against potential health risks from nuclear power plant spills or leaks of radioactive liquid; see Table 4.10-6.

Table 4.10-6. Radiation Protection Limits

Layer	Limit	Description
1	3 mrem per year (ALARA Objective) Appendix I to 10 CFR Part 50	Off-site radiation doses from gas and liquid releases: The NRC requires that nuclear plant operators keep these as low as reasonably achievable. For liquid releases, such as diluted tritium, the ALARA annual off-site dose objective is 3 millirem (mrem) to the whole body or 10 mrem to any organ of someone living close to the plant boundary. This ALARA objective is 3 percent of the annual public radiation dose limit of 100 mrem and a small fraction of the average natural background radiation dose.
2	25 mrem per year standard 10 CFR Part 20.1301(e)	Dose limits for individual members of the public related to nuclear power operation: In addition to NRC limits on effluent releases (see Layer 1), nuclear power plant releases to the environment must comply with USEPA standards in 40 CFR Part 190, Environmental radiation protection standards for nuclear power operations (USEPA, 1997). These standards limit the annual dose equivalent from normal operations of uranium fuel-cycle facilities (except mining, waste disposal operations, transportation, and reuse of recovered special nuclear and by-product materials). Radon and its decay products are excluded from these standards. These USEPA radiation dose limits are 25 mrem (whole body), 75 mrem (thyroid), and 25 mrem (any other organ of an individual member of the public). These standards apply to all nuclear power plants and facilities that mill and manufacture nuclear fuel. NRC's ALARA program requires nuclear plant operations to strive to achieve doses lower than the USEPA standards.
3	100 mrem per year limit 10 CFR Part 20.1301(a)(1)	Dose limits for individual members of the public related to civilian facilities using radioactive material: The NRC's final layer limits radiation doses to 100 mrem per year for individual members of the public. This limit applies to every civilian facility that uses radioactive material. Compliance is demonstrated by measurement or calculation, to show that (1) the highest dose to an individual

Table 4.10-6. Radiation Protection Limits

Layer	Limit	Description
		member of the public from sources under the licensee's control does not exceed the limit or (2) the annual average concentrations of radioactive material released in gaseous and liquid effluents do not exceed levels specified in 10 CFR Part 20, Appendix B, Table 2, at the unrestricted area boundary. The dose from external sources in an unrestricted area should also not exceed 0.002 rem in any given hour or 0.05 rem in 1 year.

Source: NRC, 2016a.
Acronyms: ALARA = as low as reasonably achievable; CFR = Code of Federal Regulations; mrem = millirem; NRC = US Nuclear Regulatory Commission; USEPA = US Environmental Protection Agency.

As indicated in Table 4.10-6, radiation exposure to any member of the public (maximum exposed individual) is limited to 25 mrem per year for the entire uranium fuel cycle in accordance with 40 CFR 190. This means doses must sum to less than 25 mrem per year from all sources of radiation: gaseous effluents, liquid effluents, ground water, and direct radiation.

PG&E reviewed the annual Radiation Environmental Monitoring Program (REMP) reports at DCPP for the years from 2013 through 2017. Their review indicated radioactivity levels in the off-site environment are well below the NRC established public dose limits (PG&E, 2022a). As part of this EIR, the Annual Radiological Environmental Operating Report (AREOR) reports for the years 2018 through 2020 (PG&E, 2019d; PG&E, 2020a; PG&E, 2021a) were reviewed; the results were similar to the earlier PG&E REMP review. Based on the effluent monitoring results:

- Current radiation exposure to members of the public from DCPP operations is a fraction of 40 CFR 190 limits.
- The ambient direct radiation levels in the DCPP off-site environs did not change with operation of the facility and are within the pre-operational background range.
- Operation of DCPP continues to have no detectable off-site radiological impact.
- Samples analyzed from the off-site sampling stations continue to show no radiological contribution from plant operations.

The calculation of doses to the public are described in the 2020 AREOR (PG&E, 2021a) and in the Annual Radiological Effluent Release Report (PG&E, 2021b). The analyses indicate that a major factor contributing to gaseous tritium activity is evaporation from the SFPs. Beta and gamma air doses were calculated at the northwest site boundary, and total body dose was calculated for a full-time resident in the east direction at approximately 4.6 miles (7.43 km) from the DCPP site. The total body dose calculation includes both inhalation and ingestion dose from radionuclide C-14 and non-noble gas organ dose. The dose calculations indicate that, due to DCPP's remote location and its surrounding security exclusion area, there are no members of the public who can receive significant doses from the site's liquid effluents. Total body dose from liquid released is calculated for a hypothetical receptor.

PG&E plans to continue their controls on potential radiological releases during decommissioning (PG&E, 2022a). Copies of all Radioactive Effluent and Environmental Reports from all nuclear

power plants are available at https://www.nrc.gov/reactors/operating/ops-experience/tritium/plant-info.html.

Documents Required by NRC for Radiological Hazard Analysis

In addition to the laws, regulations and guidelines described above, NRC has specified the development and use of several analytical reports to assist facility operators to conduct surveys, sampling, monitoring and radiological safety analyses to ensure that sites and facilities are safely managed in compliance with NRC requirements. Table 4.10-7 identifies and explains the content of these reports, which include an HSA, a Site Characterization Plan, and two monitoring reports – an AREOR and a REMP. Each of these reports contains detailed information that enables facilities to maintain a safety focused environment that protects the health and safety of employees, the public and the environment.

Table 4.10-7. Documents Required by NRC for Radiological Hazard Analysis

Document	Description
Historical Site Assessment	An HSA was performed in 2018 which was a comprehensive investigation designed to collect, organize, and evaluate existing historical information relative to the DCPP site. The HSA identified potential, likely, or known sources of radioactive and non-radioactive contamination within buildings, on plant structures, and in the site's surface and subsurface environment, based on existing or derived information (PG&E, 2018b; PG&E, 2021c).
Site Characterization Study Report	The Site Characterization Study Report would incorporate planning documents and the actual measurements with conclusions. The Plan would incorporate a Data Quality Objective (DQO) process as described in NUREG-1575, Multi-Agency Radiation Survey And Site Investigation Manual (MARSSIM), which establishes requirements for radiation detection, instrumentation, laboratory analyses, survey designs to ensure that the quality of collected data is sufficient to support subsequent site cleanup and other decommissioning decisions. The report would also show how the site complies with the regulations promulgated by both the California Environmental Protection Agency (CAL EPA) and the USEPA. Site characterization must be conducted over the entire DCPP site, further broken down into nine described study areas. The process would be iterative and would include required site cleanup requirements for both radiological and chemical contaminants for the DCPP site (PG&E, 2021c).
Annual Radiological Environmental Operating Report (AREOR) and Radiological Environmental Monitoring Program (REMP)	The AREOR (PG&E, 2021a) provides summaries of the environmental data from exposure pathways, interpretations of the data, and analyses of trend results. Routinely monitored pathways include ingestion, inhalation, and direct radiation. Routes of exposure are based on site specific information such as receptor locations, receptor ages, distance, and direction to release locations, and water usage around the plant. The site-specific REMP program has been developed and maintained in accordance with NUREG-1301 (NRC, 1991b). The DCPP REMP includes the sampling and analysis of groundwater monitoring wells located at the site for all plant-related licensed radionuclides, including hard-to-detect radionuclides.

Acronyms: AREOR = Annual Radiological Environmental Operating Report; CAL EPA = California Environmental Protection Agency; DCPP = Diablo Canyon Power Plan; HSA = Historical Site Assessment; MARSSIM = Multi-Agency Radiation Survey and Site Investigation Manual; REMP = Radiological Environmental Monitoring Program; USEPA = United States Environmental Protection Agency.

NRC Oversight at the DCPP

All nuclear activities that occur at DCPP are overseen by the NRC. The NRC has installed two resident inspectors at DCPP to conduct inspections, monitor significant work projects, and interact with plant workers and the public (NRC, 2022c). The NRC also conducts periodic, regular inspections covering the requirements contained, in part, in 10 CFR Part 73.55, which include access authorization, access control, security equipment testing, security force training, inspection of physical barriers, and intrusion detection and alarm assessment monitoring systems, among other areas.

The NRC's routine inspections of power reactor security include evaluations of the licensee's ability to protect the plant from the design basis threats of radiological sabotage, theft, and diversion. These evaluations, which have been conducted since 1992, are realistic mock attacks that challenge the plant's security force and systems. Since 2004, these NRC-evaluated exercises have been fully integrated with the inspection program for physical protection.

Operators such as PG&E are also subject to inspection and evaluations of their material control and accounting (MC&A) programs. NRC regulations in 10 CFR Part 74 include general reporting requirements applicable to anyone who possesses, transfers, or receives quantities of Special Nuclear Material. NRC regulations also require licensees to keep complete records of receipt, transfer, and inventory of all Special Nuclear Material; to develop and follow written procedures that are adequate to account for and control all Special Nuclear Material possessed; and to perform periodic physical inventories.

State and Local Regulatory Setting

The California Environmental Quality Act (CEQA) requires the County, as the Lead Agency, to consider the whole of the action in reviewing the Proposed Project (State CEQA Guidelines Sections 15003(h) and 15378), including those aspects of the Project that are legally beyond its jurisdiction (i.e., regulation of radiological aspects of decommissioning) or geographically outside of its jurisdiction (i.e., activities performed within California State Lands Commission [CSLC] or California Coastal Commission [CCC] jurisdiction). To meet CEQA legal requirements and the objectives of meaningful public disclosure and informed decision making, this EIR analyzes all potential impacts of the Project—both those over which the County has the authority to impose mitigation and those it does not. The County has been determined to be the appropriate lead agency responsible for considering the effects of all activities involved in the Proposed Project. Because DCPP is located within unincorporated San Luis Obispo County, the County has jurisdiction over a large majority of Project-related activities both within and outside of the coastal zone. Additionally, the County maintains an approved Local Coastal Program (LCP) through the CCC, which gives the County jurisdiction to approve and deny projects within the coastal zone (portions of which are within the CCC appeal jurisdiction). PG&E submitted a Development Plan (DP)/Coastal Development Permit (CDP) and Conditional Use Permit ("CUP"— for non-Coastal site area) application to the County which triggers a CEQA review of the decommissioning project activities (PG&E, 2021c).

The California Department of Toxic Substances Control (DTSC) regulates the hazardous component of mixed waste or combined waste (waste containing both hazardous and low-level

radioactive materials). DTSC issued a RCRA-equivalent Hazardous Waste Facility Permit (No. CAD077966349) to PG&E, which is effective through September 26, 2028; this permit is planned to be renewed in support of the Proposed Project. All hazardous material handling, transport, and disposal is subject to existing Department of Transportation (DOT) and the DCPP facility hazardous waste permit requirements. The DCPP facility hazardous waste permit outlines the location, storage methods, and volumes for temporary storage (one year maximum) of hazardous waste (PG&E, 2021c).

4.10.3 Significance Criteria

4.10.3.1 Hazardous Materials

The significance criteria used to evaluate the Proposed Project's impacts to hazardous materials are based on Appendix G of the State CEQA Guidelines. According to Appendix G of the State CEQA Guidelines, a significant impact would occur if the Proposed Project would:

- Create a substantial hazard to people or the environment through the routine transport, short- or long-term storage, use, or disposal of hazardous materials or through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.
- Be located on a site included on a list of hazardous materials sites, compiled pursuant to Government Code Section 65962.5 and, as a result, could create a significant hazard to the public or the environment.
- Result in mobilization of environmental contaminants, including disease vectors, currently existing in the soil or groundwater creating potential pathways of exposure to humans or other sensitive receptors.
- Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.
- Create a substantial aviation hazard within 2 miles of an airport or airstrip resulting in a safety hazard for people residing or working in the Project area.
- Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.
- Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires.

4.10.3.2 Radiological Materials

In 2002, the NRC prepared, pursuant to the National Environmental Policy Act (NEPA) (42 US Code 4321-4347), a Final Generic Environmental Impact Statement (GEIS) on Decommissioning of Nuclear Facilities Supplement (referred to as NUREG-0586) to analyze environmental impacts associated with the decommissioning of nuclear power plants throughout the country (NRC, 2002b). This document requires licensees to demonstrate, in a PSDAR submittal, that the environmental impacts associated with each particular nuclear power plant decommissioning effort are bounded by (i.e., fall within) the impacts evaluated in the 2002 GEIS Supplement or other

previously issued Environmental Assessment or EIS, or additional NEPA review would be necessary (NRC, 2002b). This filing is required to be submitted prior to any major decommissioning activity.

The NRC uses terms from NEPA documents to define the standards of significance (i.e., significance criteria) for assessing radiological environmental impacts associated with decommissioning, as shown in Table 4.10-8.

Table 4.10-8. Levels of Significance

Level	Description
SMALL	Environmental effects are not detectable or are so minor that they will neither destabilize nor noticeably alter any important attribute of the resource. For the purposes of assessing radiological impacts in the GEIS Supplement, the NRC concluded that impacts that do not exceed permissible levels in the NRC's regulations are considered small.
MODERATE	Environmental effects are sufficient to alter noticeably, but not to destabilize, important attributes of the resource.
LARGE	Environmental effects are clearly noticeable and are sufficient to destabilize important attributes of the resource.

Source: NRC, 2002b – NUREG-0586.

As shown in Table 4.10-9, the NRC determined that radiological impacts from decommissioning nuclear power facilities are SMALL. This analysis assumes that decommissioning activities are conducted in compliance with NRC regulations and guidelines, and under NRC oversight. The column labeled “Generic” indicates that the GEIS included a comprehensive analysis of each of the categories of potential radiological impacts.

Table 4.10-9. Summary of NRC 2002 GEIS Radiological Impact Analysis for Decommissioning Nuclear Power Facilities

Issue	Generic	Impact
Radiological		
- Activities resulting in occupational doses to workers	Yes	SMALL
- Activities resulting in doses to the public	Yes	SMALL
Radiological Accidents	Yes	SMALL
Occupational Issues	Yes	SMALL
Transportation	Yes	SMALL

Source: NRC, 2002b – NUREG-0586.

The Independent Spent Fuel Storage Installation (ISFSI) was previously approved by the County of San Luis Obispo. However, the approval was appealed to the CCC and conditionally approved (see Section 1.2.2, *ISFSI Approval and Cask Design*). In 2014, the NRC analyzed potential radiological environmental impacts associated with ISFSIs over three possible timeframes: a short-term timeframe, which includes 60 years of continued storage after the end of a reactor’s licensed life for operation; an additional 100-year timeframe (60 years plus 100 years) to address the potential for delay in the availability of a long-term, off site repository; and a third, indefinite timeframe to address the possibility that a repository never becomes available. Potential impacts

for activities, facilities, and areas important to radiological hazards were analyzed by the NRC for each of these possible timeframes and are presented in Table 4.10-10. For all activities and systems related to the ISFSI, the radiological impacts were determined to be SMALL. As above, this analysis is based on the presumption that decommissioning activities are conducted in compliance with NRC regulations and guidelines, and under NRC oversight.

Table 4.10-10. Summary of NRC Analysis of ISFSI Storage Impacts

Category		Storage		
		Short-Term	Long-Term	Indefinite
Waste Management	LLW	SMALL	SMALL	SMALL
	Mixed Waste	SMALL	SMALL	SMALL
Transportation	Traffic	SMALL	SMALL	SMALL
	Health Impacts	SMALL	SMALL	SMALL
Public/Occupational Health		SMALL	SMALL	SMALL
Accidents		SMALL	SMALL	SMALL
Sabotage or Terrorism		SMALL	SMALL	SMALL

Source: NRC, 2014 – NUREG-2157, Table 4-2.

The primary NRC regulations regarding decommissioning are 10 CFR Part 50 Section 50.82, Termination of License, and 10 CFR Part 20 Subpart E - Radiological Criteria for License Termination. Following the industry practice described in NRC Inspection and Enforcement (I&E) Circular 81-07 (NRC, 1981), compliance with NRC requirements would be presumed at the actual Minimum Detectable Activity (MDA), if the MDA is at or below the described levels. Using standard detection technologies (e.g., portable radiation scanning equipment), the MDA would correspond to exposure limits that are substantially less than 5 mrem. However, as discussed above, California Executive Order D-62-02 places a moratorium on the in-state disposal, reuse, or recycling of any decommissioning wastes in California (California Office of Governor, 2002).

California's DTSC has also issued an Information Advisory on Clean Imported Fill Material regarding the introduction of hazardous waste as fill material at sensitive use areas (CAL-EPA, 2001).

The site-specific significance criteria used to evaluate the Proposed Project impacts related to hazardous or radiological materials are based on Appendix G of the State CEQA Guidelines with attention to the descriptions contained in the NRC's 2002 GEIS. Significant radiological impacts could result from conditions or the risk of events or incidents that could:

- Create a substantial hazard to site decommissioning workers, the public, or the environment through decommissioning and disposal of radioactive materials.
- Result in a design basis accident (DBAs) or severe (beyond design basis) accident during decontamination and dismantlement activities.
- Increase the probability or volume of liquid spills containing radioactive material into the environment.
- Increase residual radioactivity concentrations in ground, soil, or groundwater through dust control measures or through intentional dilution (mixing) of radioactive material with slightly contaminated or clean material.

- Result in inadequate existing and proposed emergency response capabilities to effectively mitigate spills, fires, and other accident conditions involving radioactive material during decommissioning, such that there is a substantial impact on safety of the public and site workers.
- Identify a larger or higher concentration tritium plume on site during decontamination and dismantlement activities.
- Result in a failure to comply with regulations applicable to radiological materials.

4.10.4 Environmental Impact Analysis and Mitigation

Nuclear power plant operations may cause releases of radionuclides into the air, soil, and groundwater that must be remediated to prevent off-site migration or to meet decommissioning and license termination criteria. The physical characteristics of some radionuclides, and the levels of contamination that result from nuclear power plant operations, could require implementation of industry standard technologies and potentially additional, innovative methods to remediate the radiological risks associated with decontamination and decommissioning activities associated with the Proposed Project.

Nuclear power plant decommissioning requires expertise in safe industrial dismantling and demolition, nuclear power plant operations, radiation protection, radiological characterization, environmental protection, radwaste management, and other specialized disciplines (EPRI, 2013). The DCPP site includes numerous systems, structures and facilities known to contain radiological materials (e.g., the SFPs and approved ISFSI) or have known or potential contamination caused by releases of non-radiological or radioactive hazardous materials during the operation of the reactors and their support facilities. The natural environment at the site (including soil and groundwater) has also been impacted by the release of non-radiological and radiological hazardous materials during past operations.

4.10.4.1 Hazardous Materials

Impact HAZ-1: Expose people to hazardous materials or create soil and/or groundwater contamination due to accidental spills or release of hazardous materials (Class II: Less than Significant with Mitigation).

Phase 1

DCPP Project Site

Non-radiological hazardous waste generated at DCPP is currently stored at the on-site hazardous waste management facility. During the Proposed Project, non-radiological hazardous wastes would also be stored and managed at the existing on-site hazardous waste management facility. While this would be a temporary increase in use of the facility, the DCPP Hazardous Materials Business Plan manages the hazardous materials inventory, emergency contacts, provides a site plan, response strategies, and procedures for on-site refueling (refueling stations and fuel tank locations, maintenance, and operation). Removal of hazardous wastes (e.g., asbestos and lead-based paint from buildings and contaminated soil excavated from underground storage tank

sites) as addressed in the Waste Management Program may temporarily require increased use of the hazardous waste facility to handle, characterize, and transport the waste to approved disposal facilities.

Public access to DCPP is restricted and site activities related to hazardous materials handling during decommissioning would not affect the public. All hazardous material handling, transport, and disposal would be subject to existing US Department of Transportation (DOT) and DCPP facility hazardous waste permit requirements. The DCPP facility hazardous waste permit outlines the location, storage methods, and volumes for temporary storage (one year maximum) of hazardous waste. DTSC issued a RCRA-equivalent Hazardous Waste Facility Permit to PG&E, which is effective through September 26, 2028. Due to the timing of decommissioning, the Permit may require extension and would be completed per MM HAZ-1 (*Facility Hazardous Waste Permit Extension*).

Transport of non-radiological hazardous wastes offsite for disposal would be accomplished by barge, rail, or truck in accordance with state and local permits. The transport of hazardous materials would increase temporarily during the Project. Implementation of MM HAZ-1 (*Facility Hazardous Waste Permit Extension*) along with the existing DCPP Hazardous Materials Business Plan, would ensure that response strategies, including proper procedures for handling, storing, and managing accidental spills or release of hazardous materials, are in place. As such, the Proposed Project would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials, and impacts would be reduced to a less-than-significant level (Class II).

Railyards

Pismo Beach Railyard. Transport of non-radiological hazardous wastes off site for disposal would be accomplished by rail, in accordance with state and local permits. The PBR site would only be used as a contingency site for the transport of non-radiological hazardous materials by rail. Currently, the site supports PG&E's operations and has been used for various equipment and material storage and transport needs in support of DCPP. The site contains a rail spur off a Union Pacific Railroad line, which has been used to transport large components, waste, and other various pieces of equipment during the construction and operation of DCPP. Shipments to this site would be subject to the same hazardous material handling, transport, and disposal regulations as described above. The PBR site would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials, and impacts would be less than significant (Class III).

SMVR-SB. Radiological waste (Class A, B, C) would be handled and transported at the SMVR-SB site. Please see discussion of impacts under Radiological Materials (Section 4.10.4.2). Non-radiological hazardous waste could be delivered to this site as well. The transport of hazardous materials would increase temporarily during the Proposed Project. The SMVR-SB site is an existing industrial facility and is presently utilized as a rail loading facility for a variety of materials including hazardous liquids and materials. Shipments to these sites would be subject to the same hazardous material handling, transport, and disposal regulations as described above. Transport of non-radiological hazardous waste at the SMVR-SB site would not create a significant hazard to the public or the environment through the routine

transport, use, or disposal of hazardous materials, and impacts would be less than significant (Class III).

Phase 2

Activities in Phase 2 include contaminant remediation, demolition of remaining utilities and structures, soil grading and landscaping, long-term stormwater management, closure of the Intake Structure, and continuation of Discharge Structure removal and restoration activities. Construction activities would involve construction equipment and vehicles entering and exiting the DCPP site to transport workers, materials, and structures, but at a much smaller scale compared to Phase 1.

During Phase 2, there would be limited or minimal transport of non-radiological hazardous wastes off site for disposal, accomplished by barge or truck in accordance with state and local permits. As with Phase 1, the transport of hazardous materials would increase temporarily during the Proposed Project. Implementation of MM HAZ-1 (*Facility Hazardous Waste Permit Extension*) along with the existing DCPP Hazardous Materials Business Plan would ensure that response strategies, including proper procedures for handling, storing, and managing accidental spills or release of hazardous materials, are in place. As such, the Proposed Project would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials, and impacts would be reduced to a less-than-significant level (Class II).

As described in Section 2.3.16.3, *Recycled Concrete*, direct reuse of clean concrete without soil blending would only occur where the crushed concrete is isolated from stormwater and groundwater, specifically the water circulation tunnels associated with the Intake Structure and Discharge Structure. In these instances, the crushed concrete would be used as an aggregate and blended with cement to create a controlled low strength material to fill the water circulation tunnels. Because the crushed concrete is completely isolated from stormwater and groundwater, there is no potential risk due to leaching. Crushed concrete would also be blended with soil into an engineered fill within the lower terrace of the DCPP site. As discussed under Impact HWQ-1 in Section 4.11, *Hydrology and Water Quality*, potential leaching from crushed concrete at this lower elevation cannot lead to any drinking water source due to overall site hydrogeological characteristics and the higher elevation of the aquifer replenishing the location tapped by the deep water well. As such, leachate from crushed concrete reuse at the DCPP site would not create soil and/or groundwater contamination and impacts from leachate would be less than significant (Class III).

Post-Decommissioning Operations

New Facility Operations. Following Phase 2, activities at the DCPP site associated with the Proposed Project include operation of the new GTCC Waste Storage Facility, Security Building, indoor Firing Range, and Storage Buildings. Please see discussion of impacts under Radiological Materials (Section 4.10.4.2) regarding the new GTCC Waste Storage Facility. Accidental spills and the potential release of hazardous materials would not be expected to occur at the Security Building, Storage Buildings, or GTCC Waste Storage Facility, as operations do not involve the use of hazardous materials. For the indoor Firing Range, ammunition would be contained within the building and properly disposed. Therefore, no impact would occur.

Future Actions. Marina operations would require submittal of a Development Plan and Coastal Development Permit for re-use at the site. PG&E has stated that operations would be limited to car parking, restrooms, and use of boats and non-motorized water vessels, such as kayaks and stand-up paddleboards. While limited, these activities have the potential to create soil and/or groundwater contamination due to accidental spill or release of hazardous materials. As discussed in Section 4.11, *Hydrology and Water Quality*, MM HWQ-1 (*Long-Term Erosion and Sediment Control Plan*) ensures any runoff from the new parking lots or restroom facilities would be controlled and treated. Additionally, as required by MM HWQ-2 (*Clean Marina Lease Provisions*), PG&E would be required to include clean marina provisions in any future lease for the Marina's use. As such, impacts would be reduced to a less-than-significant level (Class II).

Mitigation Measures for Impact HAZ-1.

HAZ-1 **Facility Hazardous Waste Permit Extension.** Prior to the start of decommissioning (ground-disturbing and dismantling) activities during Phase 1, and as necessary during Phase 2, the Applicant or its designee shall coordinate with the California Department of Toxic Substances Control to add all decommissioning activities to the existing DCPP facility permit and obtain time extensions as necessary until all regulated waste is removed from the DCPP site. Separate Hazardous Waste Permits shall be obtained for the activities at the railyards (Pismo Beach Railyard and/or Santa Maria Valley Railyard – Betteravia Industrial Park). A copy of the Hazardous Waste Permit Extension and the Pismo Beach Railyard and Santa Maria Valley Railyard – Betteravia Industrial Park Hazardous Waste Permits shall be provided by the Applicant or its designee to the County of San Luis Obispo at least two weeks prior to the start of decommissioning activities for Phase 1 and Phase 2. The County of San Luis Obispo shall verify the Hazardous Waste Permit Extension prior to decommissioning activities.

HWQ-1 **Long-Term Erosion and Sediment Control Plan.** See Section 4.11.

HWQ-2 **Clean Marina Provisions.** See Section 4.11.

Impact HAZ-2: Expose workers to hazardous materials from mobilization of existing soil or groundwater contamination (Class II: Less than Significant with Mitigation).

Phase 1

DCPP Project Site

The Proposed Project would require demolition and removal of many structures and components that contain non-radiological hazardous materials, such as structures that may include asbestos or lead paint. Building materials containing asbestos would be removed in accordance with CalOSHA requirements, CalOSHA worker registration policies, and standard practice and construction safety orders of the California Department of Industrial Relations. Structures with lead-based paint would require removal of the paint prior to cutting, torching, or demolition in accordance with California Department of Industrial Relations regulations. Oil sumps and underground storage tanks containing oil, diesel fuel, or other hazardous fluids would also be removed.

Hazardous chemicals contained in storage tanks (above or below ground) would be removed by pumping the contents into an approved tank or truck for proper transport and disposal.

In addition, during Project activities, hazardous materials such as vehicle fuels, oil, hydraulic fluid, and other maintenance fluids would be used and stored in staging yards and at the dock locations to support ongoing marine activities. Gasoline, diesel fuel, oil, hydraulic fluid, lubricants, solvents, and cleaning chemicals used in deconstruction activities, equipment, and vehicles could be released during decommissioning from accidents or leaking equipment or vehicles. Spills and leaks of hazardous materials could result in soil or groundwater contamination. Leaks from equipment used offshore (barges and cranes) could adversely affect marine waters.

Removal of hazardous substances prior to demolition, in accordance with standard practices, and the use of safety equipment would minimize the potential for an increased risk of fire, explosion, and hazardous material release.

The spill control associated with petroleum products is directed by the DCPP's Spill Prevention, Control, and Countermeasure (SPCC) Plan as required by 40 CFR 112 for facilities maintaining an inventory of more than 1,320 gallons of oil or oil-based products. The SPCC Plan limits but does not eliminate the risk of oil spills through several measures including: proper storage and handling procedures, standard hazardous waste transport, training of personnel, procedures for fueling and maintaining construction equipment, and an emergency response program to ensure quick and safe cleanup of accidental spills.

A DCPP site-specific Stormwater Pollution Prevention Plan (SWPPP) would be prepared in compliance with the State's National Pollutant Discharge Elimination System (NPDES) in support of a Construction Stormwater General Permit (CGP) that would be required as the area of disturbance at DCPP is greater than one acre. If disturbance at the SMVR-SB site exceeds one acre, a SWPPP would be prepared. The site-specific SWPPP would specify erosion and sediment controls to minimize construction impacts on surface water quality and be designed specifically for the hydrologic setting of the DCPP site. The site-specific SWPPP would identify potential pollutant sources vulnerable to rainwater events along the coastal bluffs surrounding the Discharge Structure and Intake Cove.

In addition to the SWPPP, MM HAZ-2 (*Worker Registration/Certification*) requires workers to have the required registrations to remove asbestos, lead-based paint, and other hazardous materials. This would reduce the potential to expose workers to hazardous materials from mobilization of existing soil or groundwater contamination as workers would be trained and certified to handle hazardous materials. As such, this impact would be reduced to a less-than-significant level (Class II).

During the removal of below-ground structures and adjacent soil, contaminated soil and groundwater may be encountered. Contaminated soil may be encountered below asphalt, where leaks and spills have reached the underlying soil. Unanticipated soil contamination could exist in many areas of the DCPP facility and include gasoline and diesel fuel residuals, heavy metals, solvents, oil, PCBs, or other hazardous materials. While the required SWPPP would partly address the excavation, handling, and disposal of contaminated soil, additional mitigation is required to fully protect workers from unknown soil contamination. If field screening and laboratory data are not

properly interpreted, environmentally contaminated soil could be improperly handled and disposed of, resulting in additional environmental contamination or exposure of workers to non-radioactive contaminated materials. MM HAZ-3 (*Soil and Groundwater Site Characterization Work Plan*) requires the preparation of a Soil and Groundwater Site Characterization Study, which requires subsurface soil and groundwater sampling; an investigation work plan, including boring and sampling locations, to investigate where known and suspected soil and groundwater contamination may be present; identification of the limits of contamination based on the results of the soil and groundwater testing; and a Soil Management Plan for the identification and disposal of potentially contaminated soil. Implementation of MM HAZ-3 would mitigate the Project's adverse impacts related to unknown contaminated soil and groundwater and worker exposure to hazardous chemicals to a less-than-significant level (Class II).

Railyards

Pismo Beach Railyard. The PBR site would be used as a loading and transport facility. No ground disturbance would occur at this site. Potential impacts related to the transport of hazardous materials are discussed above under Impact HAZ-1. No impact would occur.

SMVR-SB. The SMVR-SB site is in a primarily rural agricultural area and has been historically utilized as an industrial facility. No ground disturbance would occur at this site. Potential impacts related to the transport of hazardous materials are discussed above under Impact HAZ-1. No impact would occur.

Phase 2

Activities in Phase 2 include contaminant remediation, demolition of remaining utilities and structures, soil grading and landscaping, long-term stormwater management, closure of the Intake Structure, and continuation of Discharge Structure removal and restoration activities. Construction activities would involve construction equipment and vehicles entering and exiting the DCPP site to transport workers, materials, and structures, but at a much smaller scale compared to Phase 1.

During Phase 2, there would be limited or minimal transport of non-radiological hazardous wastes offsite for disposal, which would be accomplished by barge or truck in accordance with state and local permits. As with Phase 1, adherence to the DCPP's SPCC Plan and Project-specific SWPPP would reduce impacts related to possible hazardous waste spills, but not to a less-than-significant level. In addition to the SWPPP, MM HAZ-2 (*Worker Registration/Certification*) requires workers to have the required registrations to remove asbestos, lead-based paint, and other hazardous materials. This would reduce the potential to expose workers to hazardous materials from mobilization of existing soil or groundwater contamination as workers would be trained and certified to handle hazardous materials. With the implementation of MM HAZ-2, impacts related to a hazardous material release would be reduced to a less-than-significant level.

During the removal of below ground structures and adjacent soil, contaminated soil and groundwater may be encountered. MM HAZ-3 (*Soil and Groundwater Site Characterization Work Plan*) requires the preparation of a Soil and Groundwater Site Characterization Study, which requires subsurface soil and groundwater sampling; an investigation work plan, including boring and sampling locations, to investigate where known and suspected soil and groundwater

contamination may be present; identification of the limits of contamination based on the results of the soil and groundwater testing; and a Soil Management Plan for the identification and disposal of potentially contaminated soil. Implementation of MM HAZ-3 would mitigate the Project's adverse impacts related to unknown contaminated soil and groundwater and worker exposure to hazardous chemicals to a less-than-significant level (Class II).

Post-Decommissioning Operations

New Facility Operations. Following Phase 2, activities at the DCPP site associated with the Proposed Project include operation of the new GTCC Waste Storage Facility, Security Building, indoor Firing Range, and Storage Buildings. Please see discussion of impacts under Radiological Materials (Section 4.10.4.2) regarding the new GTCC Waste Storage Facility. No ground disturbance is expected to occur at the Storage Buildings, Security Building, or indoor Firing Range. No impact would occur.

Future Actions. After DCPP is fully decommissioned, PG&E proposes that a third party would operate the Marina area at the DCPP site. Marina operations evaluated in this EIR would include boating activities and construction and operation of the ancillary structures, parking lots, and public restroom facilities. Construction of restroom facilities involves excavation and could expose workers to hazardous materials from mobilization of existing soil or groundwater contamination. As with Phase 1, MM HAZ-2 (*Worker Registration/Certification*) would require workers to have the required registrations to remove hazardous materials. This would reduce the potential to expose workers to hazardous materials from mobilization of existing soil or groundwater contamination as workers would be trained and certified to handle hazardous materials. With the implementation of MM HAZ-2, impacts related to a hazardous material release would be reduced to a less-than-significant level (Class II).

Mitigation Measures for Impact HAZ-2

HAZ-2 **Worker Registration/Certification.** Prior to the start of any ground disturbing and dismantling activities, the Applicant or its designee shall require workers to have the required registrations to remove asbestos, lead-based paint, and other hazardous materials. The Applicant or its designee shall submit a list of all workers and their associated certification records to the County of San Luis Obispo 60 days prior to the start of any ground disturbing or dismantling activities on the DCPP site. The Applicant or its designee shall obtain verification from the County of San Luis Obispo that the list of workers and their certification records are approved prior to the commencement of any decommissioning activities or issuance of building permits for demolition, grading, or construction.

HAZ-3 **Soil and Groundwater Site Characterization Work Plan.** Prior to the start of decommissioning (ground disturbing and dismantling) activities during Phase 1, the Applicant or its designee shall prepare a comprehensive Soil and Groundwater Site Characterization Work Plan for non-radiological contamination testing, which shall include:

- Subsurface soil and groundwater sampling, after site safety constraints have been addressed (i.e., underground utilities deactivated or removed).

- An investigation work plan, including boring and sampling locations, to investigate where known and suspected soil and groundwater contamination may be present.
- Identification of the limits of contamination based on the results of the soil and groundwater testing, and procedures to protect workers during excavation, handling, and disposal of materials exceeding regulatory limits.
- A Soil Management Plan for the identification and disposal of potentially contaminated soil, which shall:
  - Consider that some contaminated soil may be present outside the limits identified in the Soil Characterization Study.
  - Include the required qualifications for professionals who shall monitor soil conditions, conduct soil sampling, coordinate laboratory testing, oversee soil excavation and disposal, determine the anticipated field screening methods, and appropriate regulatory limits.
  - Contain requirements for documentation and reporting of incidents of encountered contaminants, such as documenting locations of occurrence, sampling results, and reporting actions taken to remediate non-radiological contaminated materials.

The Applicant or its designee shall submit the Soil and Groundwater Site Characterization Work Plan to the County of San Luis Obispo for review and approval a minimum of 60 days prior to the start of any decommissioning activities. Implementation of the approved plan shall begin within 90 days of the cessation of operations of the last operating reactor. In addition, monthly soil monitoring reports shall be submitted to the County of San Luis Obispo for review, with the first report due 30 days after the Soil and Groundwater Site Characterization Work Plan is approved by the County of San Luis Obispo.

Impact HAZ-3: Expose workers and the public to Valley Fever due to mobilization of Coccidioides fungus spores in construction related dust (Class III: Less than Significant).

Phase 1

DCPP Project Site

Coccidioidomycosis, often referred to as San Joaquin Valley Fever or Valley Fever, is a fungal infection that varies with the season and most commonly affects people who live in hot dry areas with alkaline soil. This disease affects both humans and animals and is caused by inhalation of arthroconidia (spores) of the fungus *Coccidioides immitis*. *Coccidioides immitis* spores are found in the top few inches of soil, and the existence of the fungus in most soil areas is temporary. DCPP is located in the Central Coast region of California, where relatively high numbers of cases of Valley Fever are reported. See Section 4.2, *Air Quality*, for a more detailed discussion on Valley Fever.

By generating fugitive dust, the Proposed Project could cause exposure to the arthroconidia (spores) of the *Coccidioides immitis* fungus if those spores are present in areas being excavated

or in areas where travel occurs on unpaved surfaces. Exposure to the *Coccidioides immitis* spores could cause site workers or other individuals nearby to contract the disease. Ground disturbing activities at the DCPP site would generate the largest proportion of fugitive dust emissions; however, because of the distances to sensitive receptors, the potential for decommissioning activities at the DCPP site to expose the public to *Coccidioides immitis* spores would be low. The primary way to avoid Valley Fever is to limit exposure to the *Coccidioides immitis* spores. As part of the Proposed Project PG&E would reduce the amount of disturbed area, reduce vehicle speeds on unpaved surfaces, and water disturbed soil areas during decommissioning (AC AQ-1, *Minimize Fugitive Dust*, and AC AQ-5, *SLOAPCD Fugitive Dust Reduction Measures*). As such, the potential for the Proposed Project to substantially increase the incidence of Valley Fever infection would not be significant (Class III).

Railyards

Pismo Beach Railyard. The PBR site would be used as a loading and transport facility. No ground disturbance would occur at this site. Therefore, the Proposed Project would not expose workers and the public to Valley Fever due to mobilization of *Coccidioides fungus* spores in construction related dust.

SMVR-SB. The SMVR-SB site would be used as a loading and transport facility. No ground disturbance would occur at this site. Therefore, the Proposed Project would not expose workers and the public to Valley Fever due to mobilization of *Coccidioides fungus* spores in construction related dust.

Phase 2

The potential for exposure to Valley Fever would occur generally within the DCPP site and may occur at a higher rate than in Phase 1 due to the extensive earth movement anticipated to re-contour the DCPP site for final site restoration. The railyard sites would not be used during Phase 2. As discussed under Phase 1, the Proposed Project could cause exposure to *Coccidioides immitis* spores if those spores are present in areas being disturbed or in areas where travel occurs on unpaved surfaces. Ground disturbing activities at the DCPP site would generate the largest proportion of fugitive dust emissions; however, because of the distances to sensitive receptors, the potential for decommissioning activities at the DCPP site to expose the public to *Coccidioides immitis* spores would be low. As part of the Proposed Project PG&E would reduce the amount of disturbed area, reduce vehicle speeds on unpaved surfaces, and water disturbed soil areas during decommissioning (AC AQ-1, *Minimize Fugitive Dust*, and AC AQ-5, *SLOAPCD Fugitive Dust Reduction Measures*). As such, the potential for the Proposed Project to substantially increase the incidence of Valley Fever infection would not be significant (Class III).

Post-Decommissioning Operations

New Facility Operations. Following Phase 2, activities at the DCPP site associated with the Proposed Project include operation of the new GTCC Waste Storage Facility, Security Building, indoor Firing Range, and Storage Buildings. Please see discussion of impacts under Radiological Materials (Section 4.10.4.2) regarding the new GTCC Waste Storage Facility. No ground distur-

bance is expected to occur at the Storge Building, Security Building, or indoor Firing Range. No impact would occur.

Future Actions. Retained facilities available for use by a third party after decommissioning include the Marina, closed Intake Structure, the Intake Structure's ancillary structures, and boat dock. New infrastructure required for operation of the Marina could include new parking lots and restrooms with septic and dispersal system. Construction could potentially expose workers and the public to Valley Fever. The primary way to avoid Valley Fever is to limit exposure to the *Coccidioides immitis* spores. As part of the Proposed Project PG&E would reduce the amount of disturbed area, reduce vehicle speeds on unpaved surfaces, and water disturbed soil areas (AC AQ-1, *Minimize Fugitive Dust*, and AC AQ-5, *SLOAPCD Fugitive Dust Reduction Measures*). Additionally, construction of the restrooms and any ancillary structures would require additional CEQA review and dust management measures through Building Permits. As such, the impacts would be less than significant (Class III).

Operation of these components would not expose workers and the public to Valley Fever due to mobilization of *Coccidioides immitis* spores, as activities would be limited to recreational, educational, or commercial boating or research activities. No impact would occur during Marina operations.

Mitigation Measures for Impact HAZ-3. No mitigation measures are required.

Impact HAZ-4: Expose sensitive receptors at existing or proposed schools to hazardous materials or hazardous waste (Class III: Less than Significant).

Phase 1

DCPP Project Site

DCPP is a remote site and is not located within 0.25 miles of an existing or proposed school. The closest school to the DCPP site is Bellevue-Santa Fe Charter School (Avila Beach) located approximately 7 miles east of the DCPP site. No impact would occur.

Railyards

Pismo Beach Railyard. The PBR site is approximately 400 feet east of the Judkins Middle School in Pismo Beach. Compliance with all applicable federal, state, and local regulations regarding handling, storage, and disposal of non-radiological hazardous materials and hazardous waste would ensure that exposure impacts related to handling, storage, and disposal of hazardous materials within 0.25-mile of existing schools are less than significant (Class III).

SMVR-SB. The SMVR-SB site is not located within 0.25 miles of an existing or proposal school. The closest school to the SMVR-SB site is Arellanes Junior High School, located approximately 2 miles east in the City of Santa Maria. No impact would occur.

Phase 2

Activities in Phase 2 include contaminant remediation, demolition of remaining utilities and structures, soil grading and landscaping, long-term stormwater management, and closure of the

Intake Structure. As mentioned above, the DCPP site is not located within 0.25 miles of an existing or proposed school. No impact would occur.

Post-Decommissioning Operations

New Facility Operations. Following Phase 2, activities at the DCPP site associated with the Proposed Project include operation of the new GTCC Waste Storage Facility, Security Building, indoor Firing Range, and Storage Buildings. DCPP is a remote site and is not located within 0.25 miles of an existing or proposed school. No impact would occur.

Future Actions. Re-use of the site for Marina operations, may be comprised of boating activities and operation of the ancillary structures, parking lots, and public restroom facilities. As mentioned above, the DCPP Marina site is not located within 0.25 miles of an existing or proposed school. No impact would occur.

Mitigation Measures for Impact HAZ-4. No mitigation measures are required.

Impact HAZ-5: Result in aviation hazards for people residing or working near an airport (No Impact).

Phase 1

DCPP Project Site

The DCPP site is not located within 2 miles of a public airport or public use airport, or within an airport land use plan. The closest public use airport is the San Luis Obispo County Regional Airport located approximately 10 miles east of the DCPP site. Therefore, the Proposed Project would not result in aviation hazards for people residing or working near the San Luis Obispo County Regional Airport.

Railyards

Pismo Beach Railyard. The PBR is not located within 2 miles of a public airport or public use airport, or within an airport land use plan. The closest public use airport is the Oceano County Airport located approximately 2.7 miles south of the PBR site. Therefore, no impact for people residing or working near the Oceano County Airport would occur.

SMVR-SB. The Santa Maria Airport is located approximately 2.8 miles east-southeast of the SMVR-SB site. This site would be used to ship radioactive waste by rail only and would not present an aviation hazard for people residing or working near the Santa Maria Airport.

Phase 2

As mentioned above, the DCPP site is not located within 2 miles of a public airport or public use airport, or within an airport land use plan. The closest public use airport is the San Luis Obispo County Regional Airport located approximately 10 miles east of the DCPP site. Therefore, Proposed Project Phase 2 activities would not result in aviation hazards for people residing or working near an airport.

Post-Decommissioning Operations

New Facility Operations. Following Phase 2, activities at the DCPP site associated with the Proposed Project include operation of the new GTCC Waste Storage Facility, Security Building, indoor Firing Range, and Storage Buildings. The DCPP site is not located within 2 miles of a public airport or public use airport, or within an airport land use plan. No impact would occur.

Future Actions. Re-use of the site for Marina operations could include boating activities and operation of ancillary structures, parking lots, and public restroom facility. As mentioned above, the proposed DCPP Marina is not located within 2 miles of a public airport or public use airport, or within an airport land use plan. The closest public use airport is the San Luis Obispo County Regional Airport located approximately 10 miles east of the DCPP site. Therefore, the Marina's operational activities would not result in aviation hazards for people residing or working near an airport.

Mitigation Measures for Impact HAZ-5. No mitigation measures are required.

Impact HAZ-6: Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan (Class III: Less than Significant).

Phase 1

DCPP Project Site

Trucking of waste from the DCPP site would occur during non-peak periods to minimize traffic-related impacts to Avila Beach, reducing the impairment of Avila Beach Drive as an evacuation route. In addition, as described in Section 4.16, *Transportation*, the export of wastes by barge is also proposed to substantially reduce the number of truck trips from the DCPP site.

PG&E maintains several emergency response plans, including the Hazardous Materials Business Plan, Emergency Plan (Police Protection), and SPCC Plan. The DCPP Hazardous Materials Business Plan is an accounting system for hazardous substances and informs emergency management programs. The Emergency Plan is an NRC-approved emergency plan that contains existing requirements for maintaining the capability to obtain off-site agency support as needed for DCPP emergencies. The SPCC Plan limits but does not eliminate the risk of oil spills through several measures including proper storage and handling procedures, standard hazardous waste transport, training of personnel, procedures for fueling and maintaining construction equipment, and an emergency response program to ensure quick and safe cleanup of accidental spills. These plans would continue to be implemented during decommissioning and from a hazardous materials perspective the Proposed Project would not impair implementation of or physically interfere with an adopted emergency response plan or evacuation plan. Therefore, impacts would be less than significant (Class III). Please see Section 4.17, *Wildfire*, Impact WF-1 for impacts related to fire protection, emergency response of fire personnel, and effects on emergency access.

Railyards

Pismo Beach Railyard. The use of this facility would be consistent with current and historic uses and would not interfere with any adopted emergency response plan or emergency

evacuation plan. Temporary storage of any non-radiological or non-hazardous waste at the PBR site would be kept at least one foot above any existing Federal Emergency Management Agency 100-year floodplain elevation. This would reduce the need for emergency response during the transport and temporary storage of non-radiological waste. Impacts would be less than significant (Class III).

SMVR-SB. The use of this railyard would be consistent with current and historic uses and would not interfere with any adopted emergency response plan or emergency evacuation plan. Wastes would be packaged and transported in compliance with US Department of Transportation regulations to prevent hazardous materials spills and reduce the need for emergency response during the transport of wastes. Impacts would be less than significant (Class III).

Phase 2

Activities in Phase 2 include contaminant remediation, demolition of remaining utilities and structures, soil grading and landscaping, long-term stormwater management, and closure of the Intake Structure. Construction activities would involve construction equipment and vehicles entering and exiting the DCPP site to transport workers, materials, and structures, but at a much smaller scale compared to Phase 1.

As with Phase 1, the Hazardous Materials Business Plan, Emergency Plan (Police Protection), and SPCC Plan would continue to be implemented during decommissioning and the Proposed Project would not impair implementation of or physically interfere with an adopted emergency response plan or evacuation plan. Therefore, less-than-significant impacts would occur (Class III). Please see Section 4.17, *Wildfire*, Impact WF-1 for impacts related to fire protection, emergency response of fire personnel, and effects on emergency access.

Post-Decommissioning Operations

New Facility Operations. Following Phase 2, activities at the DCPP site associated with the Proposed Project include operation of the new GTCC Waste Storage Facility, Security Building, indoor Firing Range, and Storage Buildings. Please see discussion of impacts under Radiological Materials (Section 4.10.4.2) regarding the new GTCC Waste Storage Facility. Accidental spills and the potential release of hazardous materials would not be expected to occur at the Storage Buildings, Security Building, or indoor Firing Range. The impact would be less than significant (Class III).

Future Actions. The Marina would be made available to a third party for permitting and reuse for recreational, education, or commercial purposes. Operations would include boating activities and operation of the ancillary structures, parking lots, and public restroom facility. These operations would not impair an adopted emergency response plan or evacuation plan, as they would not require road closures or involve physical obstructions to evacuation routes such as Diablo Canyon Road/Diablo Ocean Drive. The impact would be less than significant (Class III).

Mitigation Measures for Impact HAZ-6. No mitigation measures are required.

Impact HAZ-7: Trigger a wildland fire exposing structures and people to significant risk of loss, injury, or death (Class II: Less than Significant with Mitigation).

Phase 1

DCPP Project Site

The southern half of the DCPP site is located within a High Fire Hazard Severity Zone (FHSZ) while the northern half and surrounding area are within a Very High FHSZ within a State Responsibility Area (SRA). Please see Figure 4.17-1 (Fire Hazard Severity Zones), Figure 4.17-2 (State Fire Hazard Severity Zones at DCPP), and Section 4.17, *Wildfire*, for a more detailed discussion about fire hazard severity zones.

The DCPP site is an existing developed industrial site. PG&E maintains compliance with NRC regulation 10 CFR 50.48 for fire protection, which includes requirements for fire detection and suppression capabilities. PG&E also maintains compliance with applicable National Fire Protection Association codes and standards that are required for compliance with NRC regulations, and applicable CAL FIRE requirements. Compliance with these regulations and standards would continue throughout the Proposed Project.

Fire protection response for the DCPP site is provided by the Diablo Canyon Fire Department (DCFD), staffed by on-site PG&E staff. As proposed, during Phase 1 of the DCPP Project, PG&E would transition from the on-site DCFD to reliance on CAL FIRE/County Fire for fire protection services. Closure of the DCFD would impose the burden of providing emergency services at the DCPP site onto Avila Valley Station 62. Avila Valley Station 62 has a response time of 17 minutes to the DCPP site, which is greater than CAL FIRE/County Fire's target response time of 15 minutes for the full range of service levels for rural areas (CALFIRE/San Luis Obispo County Fire, 2012). Therefore, Avila Valley Station 62 could not adequately support both the DCPP site and the community of Avila Beach if multiple emergency events were to occur simultaneously, and may expose people or structures to loss, injury, or death from a wildfire (San Luis Obispo, 2022). Therefore, MM PSU-2 (*Retain the Diablo Canyon Fire Department and Emergency Facilities*) is recommended to maintain an acceptable level of service at the DCPP site, surrounding area, and Avila Beach so that emergency response services can adequately prevent the risk of loss, injury, or death from a wildfire. Please see Section 4.14, *Public Services and Utilities*, for a more detailed discussion about existing and future fire protection at the site.

The Proposed Project would remove and modify existing infrastructure and construct new buildings (i.e., new Security Building, GTCC Waste Storage Facility, Indoor Firing Range, and Storage Buildings) at the DCPP. PG&E has maintained Diablo Canyon Road/Diablo Ocean Drive since the DCPP has been operational and would continue to maintain it to support decommissioning equipment and traffic. Road maintenance activities could spark a fire if vehicles or equipment idle along vegetated areas along the side of Diablo Canyon Road/Diablo Ocean Drive. Some of the anticipated equipment to be used for building and structure demolition have internal combustion engines that could spark a fire if there is an engine malfunction or if work is performed near combustible materials during high fire hazard conditions. The removal, modification, and installation of infrastructure would pose a fire risk and result in impacts to the environment.

Phase 1 activities would have fewer workers and a different level of activity compared to existing DCPP operations. The reactors would no longer operate and would not pose a risk of overheating or fire, and the number of on-site workers would decrease from approximately 1,400 to approximately 870. No major permanent structures or other additional utility infrastructure would be installed that would exacerbate fire risk.

However, decommissioning activities would increase safety and fire hazard concerns for construction-related accidents, hazard spills, and hot work activities such as welding, cutting grinding, and increased combustible loading. Temporary structures would be set up to support decommissioning, and dismantlement of the plant and deactivation of plant systems. Implementing the wildfire safety measures such as those outlined in PG&E's Wildfire Mitigation Matrix, a standard matrix that is part of the DCPP Wildfire Safety Policy (see Section 4.17, *Wildfire*, and Table 2-2 in Section 2.2.4, *Ongoing Safety and Environmental Activities*) would avoid construction hot work and other applicable activities during red flag conditions. In addition, compliance with CAL FIRE's defensible space requirements for removal of dead or dying vegetation and debris (PRC Section 4291 and California Code of Regulations Title 14, Section 1299.03 – see Appendix C) and brush removal as required with every grading and construction permit and for improvements to the road leading to the SE Borrow Site would reduce the potential for sparking vegetation fires. An on-site fire department would also be available to respond to emergencies during decommissioning.

Section 2.2.4, *Ongoing Safety and Environmental Activities*, identifies several plans that may reduce the need for fire services by addressing safety protocols: DCPP Hazardous Materials Business Plan, Operational Plan, and the Transition Plan. Although the fire safety protocols in these plans would be followed throughout decommissioning activities, many of the applicable plans and programs to minimize or avoid fire safety hazards would require updating to address the decommissioning risks. Each of these plans must be evaluated for changes necessary to address decommissioning activities and updated accordingly. The current Operational Plan agreement with CAL FIRE/County Fire, in particular, must be modified to address the Project-specific decommissioning risks. The Transition Plan would provide for transitioning fire protection services from the DCFD to CAL FIRE/County Fire in a manner agreeable to both entities. MM PSU-1 (*Facility Plan Updating, Tracking, and Reporting*) would require PG&E to identify applicable plans to be updated to reflect decommissioning, update them to address decommissioning activities including training and drills, firefighting pre-plans, dispatch and notification, safety, and support capabilities between DCFD and CAL FIRE/County Fire. MM PSU-1 would also record applicable specific recommendations during Project activities and provide proof of implementation to the County. The impact would be less than significant with mitigation incorporated (Class II).

Please see Section 4.17, *Wildfire*, Impact WF-2 for a more detailed discussion about the potential to exacerbate wildfire risks during decontamination and dismantlement activities and operational plans for ensuring adequate fire protection for the DCPP site.

Railyards

Pismo Beach Railyard. The PBR is not located within Moderate, High, or Very High FHSZ, but is adjacent to Very High FHSZs within a local responsibility area LRA to the east and west (see Figure 4.17-3 in Section 4.17, *Wildfire*). Infrastructure modifications at the PBR site would be

limited to refurbishing existing rail track within the limits of the facility. No new roads, fuel breaks, emergency water sources, power lines, or other utilities would be required. Construction work would be minimal and temporary and occur within a developed, paved facility. Transport of waste would occur on existing paved roads, and trucks would not park or idle in vegetated areas. Project activities at the PBR site are consistent with existing activities at the site and would not exacerbate fire risk or trigger a wildland fire due to the installation or maintenance of infrastructure. The impact would be less than significant (Class III).

SMVR-SB. The SMVR-SB site is not located within or adjacent to a Moderate, High, or Very High FHSZ (see Figure 4.17-1 in Section 4.17, *Wildfire*). Infrastructure modifications at the SMVR-SB site would require refurbishment of existing rail spurs, installation of Class 2 road base, and placement of temporary fencing, lighting, an office trailer, portable toilets, and portable power supply on site. During Phase 1 operations, trucks would transport waste to the SMVR-SB site. Equipment for loading material from trucks to railcars would include an electric gantry crane, truck-mounted cranes, scissor lifts, reach lifts, forklifts, and railcar mover. Transport of waste would occur on existing paved roads, and trucks traveling to the sites would not park or idle in vegetated areas. Project activities at the SMVR-SB site are consistent with existing activities at this site and would not exacerbate fire risk or trigger a wildland fire. The impact would be less than significant (Class III).

Phase 2

Activities in Phase 2 include contaminant remediation, demolition of remaining utilities and structures, soil grading and landscaping, long-term stormwater management, and closure of the Intake Structure. Minor infrastructure modifications such as long-term stormwater management would occur. This includes components such as basins, revegetation, and bioswales, as well as construction of a new blufftop road segment. Installation of these features would not pose a substantial risk of wildfire because activities would be less intensive than in Phase 1. PG&E's DCPP Wildfire Safety Policy (see Section 4.17, *Wildfire*, and Table 2-2 in Section 2.2.4, *Ongoing Safety and Environmental Activities*) would prohibit vehicles and equipment from driving through vegetated areas except for required work (such as the area of the SE Borrow Site) or an emergency. Vehicles would be required to park in areas clear of vegetation with all motors turned off. Firefighting equipment such as shovels, McLeod fire tools, Pulaskis, fire extinguishers, and water pump/delivery systems would be required on work vehicles to minimize the uncontrolled spread of an accidental fire. The number of workers and intensity of activities would continue to decrease as Phase 2 progresses. Phase 2 would not exacerbate fire risk or trigger a wildland fire due to the installation or maintenance of infrastructure.

At the completion of Phase 2, the primary fire protection service provider at the DCPP would change from the DCFD to the CAL FIRE/County Fire, as outlined in the Decommissioning Operational Plan and the Transition Plan (See MMs PSU-1 and PSU-2). The Transition Plan would establish the terms for transitioning fire protection services from the DCFD to CAL FIRE/County Fire to ensure adequate firefighting capabilities post-decommissioning. Potential fire- and safety-related incidents that could occur during the transitional period would be identified and addressed in the Decommissioning Operational Plan. These plans, combined with PG&E's Wildfire Mitigation Matrix, would minimize the risk of fire during decommissioning activities.

Phase 2 would implement MM PSU-1 to ensure that these plans are updated, implemented, and recorded for the County. Phase 2 activities would not trigger a wildland fire exposing structures and people to significant risk of loss, injury, or death. Therefore, the impact would be less than significant with mitigation (Class II).

Post-Decommissioning Operations

New Facility Operations. Following Phase 2, activities at the DCPP site associated with the Proposed Project include operation of the new GTCC Waste Storage Facility, Security Building, indoor Firing Range, and Storage Buildings. Please see discussion of impacts under Radiological Materials (Section 4.10.4.2) regarding the new GTCC Waste Storage Facility. Operation of the Security Building, indoor Firing Range, and Storage Buildings would not exacerbate fire risks or result in substantial environmental impacts as operation would not involve construction or demolition activities, or the use or release of hazardous materials. Additionally, the indoor Firing Range would maintain limits on the type of ammunition allowed in the facility, routine maintenance of debris from fired ammunition in compliance with DTSC regulations and guidelines, and proper maintenance of fire extinguishers and sprinkler system as required per regulations (PG&E, 2023). No impact would occur.

Future Actions. Retained facilities available for third-party operations would include the Marina, the Intake Structure, the Intake Structure's ancillary structures, and boat dock. New infrastructure required for operation of the Marina would include a new parking lot and restrooms. Installation of that new infrastructure would require approval of a County land use permit, prior to building permit applications. Implementation of the DCPP Wildfire Safety Policy and compliance with the Wildfire Mitigation Matrix, which is part of the Wildfire Safety Policy (see Section 4.17, *Wildfire*, and Table 2-2 in Section 2.2.4, *Ongoing Safety and Environmental Activities*), would minimize the risk of accidental wildfire ignition during installation of the new parking lot and restrooms. However, operation of these components would not exacerbate fire risks causing loss, injury, or death because it would occur in paved areas and within the coastal area of the DCPP site. Boating activities would not pose a risk of wildfire. The Marina is also expected to not support a high-intensity use, as a maximum of 200 people per day is assumed to visit the Marina, and fewer people would deploy boats and other watercraft. The impact would be less than significant (Class III).

Mitigation Measures for Impact HAZ-7. See Section 4.14 for full text of measures.

PSU-1 Facility Plan Updating, Tracking, and Reporting

PSU-2 Retain the Diablo Canyon Fire Department and Emergency Facilities

4.10.4.2 Radiological Materials

There are multiple regulations PG&E must comply with to establish proof that the DCPP site is acceptable for unrestricted release. Title 10 of the Code of Federal Regulations (10 CFR) Part 20, "Standards for Protection against Radiation," states the overarching requirements regulating radiological impacts for facility operations. The framework of regulations may be best understood by reviewing what the regulations require to restore and release a site at decommissioning. The radiological criteria for license termination are in 10 CFR Part 20, Subpart E, "Radiological

Criteria for License Termination." Other applicable requirements of 10 CFR Part 20 are summarized here.

In 10 CFR 20.1003, "Definitions," "residual radioactivity" is defined as follows:

> *Residual radioactivity means radioactivity in structures, materials, soils, ground-water, and other media at a site resulting from activities under the licensee's control. This includes radioactivity from all licensed and unlicensed sources used by the licensee, but excludes background radiation. It also includes radioactive materials remaining at the site as a result of routine or accidental releases of radioactive material at the site and previous burials at the site, even if those burials were made in accordance with the provisions of 10 CFR Part 20.*

Under 10 CFR 20.1302, "Compliance with dose limits for individual members of the public," a licensee must demonstrate that, during operations and decommissioning, "The annual average concentrations of radioactive material released in liquid effluents at the boundary of the unrestricted area do not exceed the values specified in table 2 of appendix B to part 20." The concentration values are equivalent to the radionuclide concentrations which, if ingested continuously over the course of a year, would produce a total effective dose equivalent (TEDE) of 0.05 rem (50 mrem or 0.5 millisieverts [mSv]).

Subpart E of 10 CFR Part 20 includes requirements for unrestricted and restricted use of facilities after license termination (10 CFR 20.1402 and 10 CFR 20.1403, respectively). Subpart E also addresses public participation in the license termination process, the finality of license termination decisions, time periods for dose calculation, alternate dose criteria, and minimization of contamination (NRC, 1998a).

The criteria for releasing a site for unrestricted and restricted use are listed here (and summarized in Table 2-1 – excerpt below). In NUREG-1575, Supplement 1, "Multi-Agency Radiation Survey and Assessment of Materials and Equipment (MARSAME)," issued January 2009 (NRC, 2009), the NRC clarifies that if the compliance scenario is based on the reasonably foreseeable land use, the licensee should provide justification for the scenario, based on discussions with land planners, meetings with local stakeholders, trending analysis of land use for the region, or comparisons with land use in similar alternate locations. The time period of interest for possible land use changes is 100 years, depending on the rate of change in the region and the peak exposure time. Note that the 100-year timeframe is only for estimating future land uses; the licensee must evaluate doses that could occur over the 1,000-year time period specified in the LTR. The licensee should identify land uses that are less likely but plausible and evaluate scenarios consistent with these less likely but plausible land uses. In some cases, the determination of reasonably foreseeable land use may require the licensee to evaluate offsite uses of materials containing residual radioactivity as alternate scenarios in defining the compliance scenario (NRC, 2009).

In 10 CFR 20.1402, "Radiological criteria for unrestricted use," the NRC states the following:

> *A site will be considered acceptable for unrestricted use if the residual radioactivity that is distinguishable from background radiation results in a TEDE to an average member of the critical group that does not exceed 25 mrem (0.25 mSv) per year, including that from groundwater sources of drinking water, and the residual*

radioactivity has been reduced to levels that are as low as reasonably achievable (ALARA). Determination of the levels which are ALARA must take into account consideration of any detriments, such as deaths from transportation accidents, expected to potentially result from decontamination and waste disposal.

The regulation in 10 CFR 20.1403, "Criteria for license termination under restricted conditions," states the following:

A site will be considered acceptable for license termination under restricted conditions if:

(a) The licensee can demonstrate that further reductions in residual radioactivity necessary to comply with the provisions of § 20.1402 would result in net public or environmental harm or were not being made because the residual levels associated with restricted conditions are ALARA. Determination of the levels which are ALARA must take into account consideration of any detriments, such as traffic accidents, expected to potentially result from decontamination and waste disposal,

(b) The licensee has made provisions for legally enforceable institutional controls that provide reasonable assurance that the TEDE from residual radioactivity distinguishable from background to the average member of the critical group will not exceed 25 mrem (0.25 mSv) per year,

(c) The licensee has provided sufficient financial assurance to enable an independent third party to assume and carry out responsibilities for any necessary control and maintenance of the site.

(d) The licensee has submitted a decommissioning plan or License Termination Plan (LTP) to the Commission indicating the licensee's intent to decommission in accordance with §§ 30.36(d), 40.42(d), 50.82 (a) and (b), 70.38(d), or 72.54 of this chapter, and specifying that the licensee intends to decommission by restricting use of the site. The licensee shall document in the LTP or decommissioning plan how the advice of individuals and institutions in the community who may be affected by the decommissioning has been sought and incorporated, as appropriate, following analysis of that advice.

In 10 CFR 20.1401(d), the regulation states, "When calculating TEDE to the average member of the critical group the licensee shall determine the peak annual TEDE dose expected within the first 1000 years after decommissioning."

Table 2-1. Summary of 10 CFR Part 20, Subpart E

	Unrestricted Release
Dose Criterion	25 mrem TEDE per year peak annual dose to the average member of the critical group.
Timeframe	1,000 years
Other Requirements	ALARA

Source: NUREG-1549 (NRC, 1998b)

The NRC regulates radioactivity in ground water regardless of whether the material was licensed or unlicensed. Similarly, it does not matter if the release was accidental (e.g., a leak) or intentional (e.g., a planned discharge). It does not matter if the material is in a safety-related pipe or a non-safety-related pipe. It also makes no difference if the licensee is a complex power plant or a single source material licensee; the same definition of residual radioactivity applies. Surveys of ground water and surface water are required during operations and decommissioning. The level of residual radioactivity is most relevant when a licensee decides to cease operations and must satisfy the NRC's decommissioning requirements (NRC, 2010) (SC&A, Inc. [SC&A], 2022).

Thus, there are two controlling requirements on subsurface radioactivity that determine if a site may be released without restrictions: (1) a 25-mrem per year limit for all exposure pathways, including from drinking water, ground water, or both and (2) reducing the residual radioactivity, which includes activity in ground water, to ALARA. ALARA means making every reasonable effort to keep exposures to radiation as far below the dose limits as is practical consistent with the purpose for which the licensed activity is undertaken, while considering the state of technology, the economics of improvements in relation to the state of technology, the economics of improvements in relation to benefits to the public health and safety, and other societal and socioeconomic considerations, and in relation to utilization of nuclear energy and licensed materials in the public interest (NRC, 2010).

Release of all or part of a power reactor site after decommissioning makes it available to members of the public for use with or without restrictions. The NRC has requirements for areas to be released from the license in 10 CFR 50.82, "Termination of license," and 10 CFR 50.83, "Release of part of a power reactor facility or site for unrestricted use" (these sections incorporate 10 CFR 20.1402 and 10 CFR 20.1403). To comply with these regulations, the licensee conducts sampling and monitoring to accurately define all radioactivity remaining on the site. Following remediation, as defined in the LTP or request for partial site release, ground water must be sampled for residual radioactivity, according to an approved scheme, to demonstrate compliance with release criteria (NRC, 2010). In addition to NRC requirements, as mentioned earlier, the NRC has entered into a memorandum of understanding (MOU) with the USEPA (NRC, 2002a) on cleanup of radioactively contaminated sites. This MOU includes provisions for NRC and USEPA consultation for certain sites, including when contamination exceeds USEPA-permitted levels at the time of license termination (SC&A, 2022).

Many of the ongoing safety and environmental program activities currently implemented at DCPP would continue throughout decommissioning. PG&E's operating licenses require detailed plans and procedures to be implemented to ensure that radiological releases are minimized or avoided, and to avoid accidents or minimize any impact. To ensure a transparent decommissioning process for all stakeholders, PG&E created a partnership with labor and leading environmental organizations to discuss issues related to decommissioning, particularly the potential reuse of the DCPP site. In 2018, PG&E created the Diablo Canyon Decommissioning Engagement Panel (DCDEP)to allow direct input to PG&E by members of the local communities and subject matter experts on DCPP decommissioning issues. The DCDEP functions solely in an informational and advisory capacity. Final decisions regarding DCPP decommissioning financial matters would be made by the CPUC in conjunction with PG&E, local governments, the NRC, and other appropriate regulatory agencies (DCDEP, 2022).

In December 2019, PG&E submitted to NRC a PSDAR that included the plans and schedule to decommission DCPP Units 1 and 2 (PG&E, 2019a); a Revision 1 was submitted in October 2022 (PG&E, 2022a). PG&E intends to update the PSDAR as needed which is required by 10 CFR Part 50.82 (a) (7). The NRC also requires PG&E to prepare submittals that reflect a change in status to a decommissioned site, such as revisions to emergency planning procedures, security procedures, and DCPP technical specifications.

Pursuant to 10 CFR 50.82, all power reactor licensees must apply for termination of license. The application for termination of license must be accompanied or preceded by a LTP to be submitted for NRC approval. The LTP must be a supplement to the Final Safety Analysis Report (FSAR) or equivalent and must be submitted at least two years before termination of the license date. The NRC requires LTPs to include:

- A site characterization report;
- Identification of ongoing/outstanding dismantlement activities;
- Plans for site remediation;
- Detailed plans for the final radiation survey;
- A description of the end use of the site, if restricted;
- An updated site-specific estimate of remaining decommissioning costs;
- A supplement to the environmental report; and
- Identification of parts, if any, of the facility or site that were released for use before approval of the LTP.

This discussion of potential radiological hazards and the programs and plans that would be used to reduce their risk and consequence are organized in five sections that correspond to specific types or categories of radiologic hazards present at DCPP. These radiological hazard impact statements assess and discuss the potential significance of the hazards, and include:

- HAZ-8: Release radioactive materials during decontamination and dismantlement activities.
- HAZ-9: Release radioactive airborne concentrations to the environment greater than regulatory limits.
- HAZ-10: Increase radioactivity concentrations in soil or groundwater to a level that exceeds decommissioning criteria.
- HAZ-11: Expand the existing or create a ground water radioactive plume that could contaminate potable water.
- HAZ-12: Cause non-compliance with Federal Regulations applicable to storage, use, or transfer of radiological materials.

These impact statements encompass the range of activities, conditions and possible events or incidents that could present a risk to workers, members of the public, or the environment during decommissioning. PG&E has multiple programs, plans and initiatives in place to minimize and prevent both radiological and hazardous chemical releases. Many of the programs are ongoing, but some are to be developed, modified and/or implemented as decontamination and dismantlement activities proceed. For example, specific processes and procedures for removing radiological materials from contaminated structures, systems and components of the reactors may depend on the nature of conditions encountered during decommissioning. In addition, because

the extent of contamination is uncertain in some buildings, facilities, and across the site (e.g., in soil, groundwater, and possibly surface water), the details of remediation plans cannot be precisely defined at this time. The methods, processes, and procedures that PG&E currently plans to utilize during the Proposed Project are described in some detail in Section 2, *Project Description (Phases 1 and 2).*

Over the past several decades, both the nuclear industry and NRC have acquired substantial experience decommissioning both commercial and noncommercial nuclear reactors. As a result, industry standards and practices have been developed to ensure that decommissioning projects are accomplished safely, without adverse impacts to workers, the public or the environment. The NRC expects these types of programs would continue to be used and improved for each nuclear reactor decommissioning project. Experience to date indicates that licensee adherence to such protocols would result in SMALL radiological impacts, as presented in the 2002 GEIS (NUREG-0586) and described in Section 4.10.3.2.). In determining the significance criteria in the GEIS, the NRC staff assumed that ongoing/existing radiation protection and related safety measures would continue throughout decommissioning, including those measures implemented during plant construction and/or operation, as appropriate (NRC, 2002b).

PG&E is a member of the Edison Power Research Institute (EPRI) Remediation and Decommissioning Technology program which provides Lessons Learned from completed decommissioning projects, which are key inputs to planning decommissioning activities at the DCPP site. Topics of the Lessons Learned program are identified below (EPRI, 2007) and Project Description Table 2-2 illustrates their application at DCPP:

- Groundwater monitoring programs
- Reactor coolant system chemical decontamination
- Reactor pressure vessel internals segmentation
- Remediation of embedded piping
- Spent fuel storage
- Low-level waste management and reduction
- Interim storage of greater than Class C waste
- Application of robotics to decommissioning

Following reactor shutdown, facility decommissioning activities would occur in two phases: Phase 1: Pre-planning and Decommissioning Project Activities (2024-2031) and Phase 2: Completion of Soil Remediation, FSS, and Final Site Restoration (2032-2039). Impacts are evaluated below.

Impact HAZ-8: Release of radioactive materials during decontamination and dismantlement activities (Class III: Less than Significant).

Phase 1

DCPP Project Site

As described in Section 2.3, *Proposed Project Activities Phase 1 – Pre-Planning and Decommissioning Project Activities (2024-2031)*, most major decommissioning activities, including the decontamination and dismantlement of the reactors and other major buildings, structures, and

facilities, would occur during Phase 1 of the Proposed Project. Many of these activities have the potential for radiation exposures that could adversely affect the health of workers and the public (NRC, 2002b). Even though reactor operations would be shut down, and nuclear fuel removed from the reactor cores, potentially significant radiologic hazards remain. Without implementation of measures to contain or manage contaminated surfaces, airborne fugitive dust, contaminated soils, or liquid effluents, workers or the public could be exposed to radioactive materials during the excavation, transportation, and disposal of contaminated structures, systems, and components (SSCs), or during cleaning of radioactively contaminated surfaces.

Major decontamination and dismantlement activities are described in Section 2.3.8, *Decontamination*; Section 2.3.9, *Building Demolition*; Section 2.3.10, *Reactor Pressure Vessel and Internals Removal and Disposal*; Section 2.3.11, *Large Component Removal*; and Section 2.3.12, *Utilities, Remaining Structures, Roads, and Parking Areas Demolition*. These sections describe the structures, buildings, and facilities to be removed and the methods, techniques, and processes to be utilized. Table 4.10-3 presents an initial summary of the structures and facilities scheduled for removal during Phase 1, and a preliminary assessment of the distribution and extent of radiological contamination based on current knowledge of site characterization data and conditions. As described in Section 2.3.7, *Site Characterization Study*, further site characterization studies are planned during Phase 1 to provide more detailed and complete information regarding the location and extent of radiological contamination.

Before performing large-scale structure demolition, PG&E would prepare plans that describe the general approach to the demolition of major structures or groups of structures, and that specify requirements or controls that must be in place before and during demolition (see Section 2.3.9, *Building Demolition*). These plans would require that:

- A pre-demolition engineering report would be prepared, as required by 29 CFR 1926.850(a).
- Decontamination of the structure would be completed pursuant to the decontamination processes and procedures outlined in Section 2.3.8, *Decontamination*. Decontamination techniques would be selected that minimize potential worker exposures. Fixative coatings would be applied where required to prevent the spread of any loose contamination.
- Radioactive, hazardous, and regulated materials would be removed.
- If required by the work plans, a dust suppression system such as a “water mister” or other similar technology and supporting high-efficiency particulate air (HEPA) filters would be installed, along with required temporary power and water supplies.
- Remaining equipment, piping, components, etc., would be drained, purged, and air gapped (i.e., a common construction technique to prevent backflow).

Building demolition would use an approach that removes contaminated systems and components from each structure prior to demolition. This strategy would minimize the chance that major demolition activities would encounter unexpected contamination and would therefore reduce the potential for worker exposure. Demolition would be accomplished through industrial means and methods, including the use of tools such as track mounted backhoes, hydraulic hoerams, hydraulic shears, concrete pulverizers, universal processors, and other similar industrial tools. PG&E has successfully applied industrial means during the decommissioning of Humboldt

Bay Power Plant Unit 3. The use of explosives is not a primary demolition method; however, some targeted applications are planned as an option for the DCPP containment structure demolition once all SNF has been transferred to the ISFSI.

As described in Section 4.10.2.2 *Radiological Materials*, decontamination and dismantlement tasks would be controlled to minimize occupational radiation exposure, and to prevent the spread of radioactive materials or release of radiation to areas where a member of the public could be affected. DCPP has an established Radiation Work Permit system and worker training for this control (PG&E, 2007b). This permit system provides a mechanism for workers to notify others, plan for, and obtain approval of any work involving radiation exposure or use of radioactive material during a specific time period. The permit system also identifies the radiological conditions associated with various jobs and prescribes the limits, monitoring requirements, and protective measures applicable to the specific type of work in progress.

Prior to any decontamination or dismantlement activities, PG&E would utilize chemical decontamination techniques as appropriate to reduce the residual quantity of radioactive material present. This would reduce the potential for workers to receive radiological exposures from fixed contamination typically associated with corrosion or oxide products on inside surfaces of metal components and piping (PG&E, 2022a).

The NRC's ALARA program (NRC, 2006; SC&A, 2022) requires the lowest reasonable radiation exposure for site-wide activities including both decommissioning and routine operational activities (e.g., SFPs and approved ISFSI). ALARA program elements include job planning; dose controls and administrative limits; use of temporary shielding; pre-job briefings; dose estimates to identify priorities, establish goals, and monitor performance; and use of mockups and training for specific high-dose jobs.

Throughout building and major structure demolition activities, all equipment and personnel would be monitored for radioactive contamination prior to release or exit from a contaminated area. Contaminated equipment must be cleaned of all radioactive contamination and proven clean by survey prior to release. If a piece of equipment cannot meet the criteria for release, the equipment would be disposed of as radioactive waste.

In addition to the radiologically contaminated buildings, facilities, and SSCs identified in Table 4.10-3 that comprise DCPP, there are three other categories of potential radiological sources associated with decommissioning that must be carefully managed and monitored throughout the Project. These include airborne fugitive dust, contaminated soils, and liquid effluents that could result from spills or other activities.

Airborne Fugitive Dust

The demolition and disposal of above- and below-grade SSCs could contribute to radiological impacts by contributing to offsite airborne releases and as a potential source of fugitive dust. Releases to the air may occur as a result of expected emissions from routine decontamination or dismantlement operations or from accidents resulting from equipment failures or human error. Development of a program to limit or eliminate accidental releases requires an understanding of the types of radionuclides that may be released, the characteristics of the releases, and the

potential for exposure to a person who resides beyond the site boundary or downwind of the site.

As described briefly in Section 4.10.2.2, *Radiological Materials*, and in annual operating reports (e.g., PG&E, 2021a) the DCPP Radiological Environmental Monitoring Program (REMP) collects radiological data on numerous environmental media at the site, including direct radiation, air particulates, specific radionuclides in air (e.g., I-131 and C-14), groundwater, surface water, drinking water, various biological media (e.g., land and aquatic vegetation, fish, mussels, animals, food products), and sediment. Radioactive airborne releases are currently monitored at six stations (PG&E, 2021a). During decommissioning, airborne radiological releases would continue to be monitored and would be required to be below the same limits as if the plant was in operation. As demolition work progresses, the location of monitoring stations may be modified to better track potential fugitive dust releases due to ongoing activities.

As required by the NRC, PG&E would implement additional environmental monitoring, including deployment of semi-permanent or mobile air monitoring stations in downwind locations to provide early warning of any radioactive airborne materials escaping from work activities. This is a standard industry practice.

As part of the Proposed Project, PG&E would also minimize the creation and spread of fugitive dust in accordance with San Luis Obispo County Air Pollution Control District standards, including dust suppression measures (Applicant Commitment [AC] AQ-1, *Minimize Fugitive Dust*). When water is used for dust suppression, runoff would be captured by a groundwater collection and treatment system (GWTS) prior to release. Treated water would be discharged according to allowable discharge concentrations according to the Central Coast Regional Water Quality Control Board. Additionally, PG&E would obtain a CGP and prepare a SWPPP prior to start of construction activities (AC BIO-3, *Site-Specific Stormwater Pollution Prevention Plan* and AC WQ-1, *Construction General Permit*).

Contaminated Soils

As discussed in Sections 4.10.1.2, *Radiological Materials*, and 2.3.21, *Soil Remediation,* an IHSA was performed to collect and document existing information regarding the potential for radiological contamination of structures and areas across the DCPP site. The results of this assessment were prepared consistent with industry standards and identified areas of the DCPP site as either “impacted” or “non-impacted.” In the HSA, the DCPP site was divided into nine areas, with two of these nine areas identified as “non-impacted” from a radiological standpoint. These non-impacted areas include primarily open space areas with no structures except for roadways and fences, defined as the North Site Area (approximately 154 acres) and the South Site Area (approximately 402 acres), which extends north and west beyond the ridgeline above the Firing Range and south of the revised Owner-Controlled Area (OCA) (see Figure 4.10-1). No soil remediation is required or planned in these two areas.

The remaining seven areas defined as “impacted” under the HSA include structures or areas with radiological impacts. The radiological areas were further classified according to Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM) methods. Using the MARSSIM definitions, areas identified as Class 1 would be subject to remediation, as the current level of radionuclides on structures and/or soil within these areas are above the anticipated Derived

Concentration Guideline Level (DCGL) that equate to the NRC-approved site release criteria. While Class 3 areas were identified, the concentration of radionuclides in Class 3 areas are already below the anticipated DCGL values that equate to the NRC-approved site release criteria. As such, remediation of Class 3 areas is not considered.

The preliminary Class 1 areas identified within the HSA constitute approximately 30 acres with a total estimated volume of approximately 15,930 cubic yards (CY) of contaminated materials. For these Class 1 areas, remediation is assumed to include the removal of hardened surfaces (i.e., asphalt, concrete, etc.) and soil that are characterized with radionuclide concentrations above the DCGLs. In addition, there is approximately 20,000 CY of hazardous (not radiologically) contaminated soils. Additional site characterization activities would include the collection of soil (surface and subsurface), asphalt, concrete, and sediment samples for additional radiological analysis. The results of these characterization samples would further refine the locations, volumes, and depths of radiological impacts that would be remediated.

Soil remediation activities anticipated to occur in Phase 1, as shown in Figure 2-30, include the following (PG&E, 2021c):

- Existing Firing Range – Chemical remediation
- Power Block (within PA fence line) – Turbine Building, Containment Domes, Transformers, etc.
- Discharge Structure Area
- East Canyon Area (Zone 12 in Figure 2-12) – Chemical remediation

Removal of these materials would require excavation, transport, and disposal in approved landfills. No material from contaminated structures or soils would be used as permanent backfill; however, clean backfill materials would be used to fill voids and restore grades created by the excavation below grade of existing buildings and structures, including both contaminated and clean SSCs. Based on the analyses performed by NRC in NUREG-0586 (NRC, 2002b), PG&E expects that the radiological impacts associated with the excavation, transport and disposal of contaminated soils, and the placement of clean fill materials would be well below NRC standards.

As discussed in the HSA, there is substantial uncertainty regarding the extent and levels of contamination in several areas of the site. As a result, the total volumes and extent of soil remediation that would be required for DCPP cannot be precisely determined until after the SCS (described in Section 2.3.7, *Site Characterization Study*) is completed and the characterization survey cannot be completed until after both reactor units cease operations.

Liquid Effluents

Currently the major source of liquid radioactive waste at DCPP is the ongoing operation of the SFPs. After the shutdown of the reactors, and particularly after the SNF has been transferred from the SFP to the ISFSI (which is expected to be completed in 2029), the potential for generating radioactive liquids would diminish substantially. At that point, the dismantling of the primary systems, including the SFP, can begin. The primary system dismantling process would generate some LRW, which would require dilution via the Auxiliary Salt Water System prior to disposal. LRW would continue to be produced for some time after all the spent fuel has been transferred to the ISFSI.

In the early stages of decommissioning, much of this inventory would be collected, processed, and monitored by the existing plant equipment. While the auxiliary saltwater pumps are in operation, systems containing LRW would be drained to the LRW processing system, discharged through currently identified Discharge Point 001D, and flow into the ocean through Discharge Point 001B (see Figure 2-32). The levels of radioactive material that can be filtered out would be below the levels established during operations, and below NRC standards. Because tritium cannot be removed through conventional treatment methods, the availability of a dilution source (i.e., the auxiliary saltwater system) is required to dilute the tritium concentration in the effluent prior to discharge.

While the Auxiliary Salt Water System is in operation during decommissioning, it would also provide the necessary volume to dilute effluents received from the Seawater Reverse Osmosis treatment unit and liquid radiological waste treatment system. Furthermore, this flow stream would receive effluents from other waste streams, which may include processed sanitary waste, makeup water pretreatment system, non-radiological water from plant systems, processed water from the oily water separator, and water from the firewater system.

In addition to liquid radioactive effluents related to the SFP and reactor operations, LRW could be created by collection systems set up to support dust suppression during decommissioning, either for soil remediation activities or to capture dust associated with demolition related activities. The groundwater collection and treatment system designed to capture fugitive dust described above is an example.

As part of the Proposed Project, PG&E would use established industry techniques and best management practices (BMPs) to limit or eliminate spills of contaminated liquids. Both the Spill Control and Countermeasure (SPCC) Plan (required by 40 CFR 112) and a Storm Water Pollution Prevention Plan (AC BIO-3) required as part of the CGP (AC WQ-1) would be updated as necessary to address decommissioning activities and incorporate the techniques and BMPs. Should an unknown area of contamination be identified during sub-grade soil excavation and structure removal, the area would be assessed and controlled. The NRC is responsible for conducting audits of the implementation of these plans and would therefore oversee the updates to the plans, as necessary.

NRC Required Regulatory Measures to Limit Radiological Impacts

As described in Section 4.10.2.2, *Regulatory Setting – Radiological Materials*, NRC has exclusive authority to regulate all aspects of DCPP decommissioning related to radiological health and safety. NRC also mandates the development of numerous programs, plans, and procedures to ensure that decommissioning activities comply with the relevant requirements and to limit radiological impacts. Compliance with these laws, regulations, programs, and procedures is not optional, but is fundamental to the NRC responsibility to ensure the radiological health and safety for workers, the public, and the environment. NRC has adopted these stringent requirements in part to ensure that no additional requirements (e.g., state or locally imposed) are necessary to protect radiological health and safety.

PG&E has implemented a **Quality Assurance (QA) Program** (PG&E, 2016a, PG&E, 2016b) that is applicable to all aspects of DCPP and DCPP ISFSI operations. The QA Program is required under

NRC regulations (10 CFR § 72.140). The purpose of the PG&E QA Program is to provide assurance that the design, construction, and operation of DCPP is in conformance with applicable regulatory requirements and with the specified design bases. The PG&E QA Program describes the organizational, management, and technical controls in place to protect the radiological and environmental health and safety of workers, the public, and the environment. It includes qualification and training requirements for workers, technical and procedural controls to ensure that work is performed in compliance with requirements, and record-keeping requirements to assure that all work is documented in accordance with NRC standards.

PG&E's **Radiological Protection Program** (PG&E, 2016c), required pursuant to NRC regulations (10 CFR Part 20 and 10 CFR § 100.11), includes numerous detailed plans and procedures implemented through comprehensive training and certification programs to ensure employees are qualified and capable of conducting all operations safely and in compliance with applicable regulations, and that they are trained to respond to emergencies to protect workers and the public. The plans, procedures, and other requirements are specified in the operating licenses (and other regulatory permits, as appropriate), and the NRC provides regulatory oversight to verify that operations are conducted in compliance.

The Radiological Protection Program requires that all areas of the DCPP site be identified and categorized (e.g., high radiation, contaminated) and appropriate controls (e.g., physical barriers, monitors, detectors) established and maintained during plant operations. The comprehensive radiological health and safety program also includes:

- ***Radiological and Environmental Monitoring Program,*** which monitors for radioactive contamination in the environment and collects data on numerous environmental media to ensure that standards for radiation levels and exposure at the site are met. Direct radiation, air particulates, specific radionuclides in air (e.g., I-131 and C-14), groundwater, surface water, drinking water, various biological media (e.g., land and aquatic vegetation, fish, mussels, animals, food products), sediment, and other potentially contaminated media are all monitored.
- ***Effluents Control Program*** administered in accordance with the *Offsite Dose Calculation Manual* which regulates and monitors radioactive effluents.
- ***Groundwater Protection Initiative*** which establishes standards for sampling and reporting groundwater monitoring.
- ***ALARA Program*** which requires the reduction of radiation exposure to ALARA to site-wide activities and includes both decommissioning and routine operational activities.

All personnel (PG&E employees and/ or contractors) that enter Radiologically Controlled Areas (RCAs) or who may be involved with radiological activities receive extensive radiological training, as required by the NRC, to ensure they understand their responsibility to minimize their own dose and to comply with radiological protection procedures. Training includes, but is not limited to:

- Effect of radiation and risks associated with radiation exposure (NRC, 1996b - Regulatory Guide 8.29)
- Individual response to a radiation emergency
- Prenatal radiation dose (NRC, 1999 - Regulatory Guide 8.13)

- Radiological Controlled Areas and recognition of the associated postings (10 CFR 21 Part 20)
- ALARA philosophy and concepts (NRC, 2016c - Regulatory Guide 8.10)
- Radiological protection personnel will meet or exceed the qualifications of ANSI N18.1 -1971 or be formally qualified through a NRC approved training program
- Training for demolition procedures, radiological instrumentation, and programs
- Special briefings and additional training for work with potential for high exposures

In addition to the radiological standards regulated by NRC and USEPA, PG&E must also comply with health and safety regulations promulgated by California's Division of Occupational Safety and Health (Cal/OSHA). California has a State Plan recognized by the US Occupational and Safety Health Administration (OSHA) (US Department of Labor, 2017) and is the lead agency in safety requirements. As such, site demolition workers must also have the training courses required by Cal/OSHA. On-site management personnel must have additional supervisory training. All workers involved with hazardous waste operations and emergency response must have an annual refresher if initial training is over 1 year old.

In NRC's 2002 GEIS (NUREG-0586), NRC determined that the radiological impacts of transporting radiological waste from decommissioning to offsite facilities would be SMALL (see Table 4.10-9). NRC concluded that the risk associated with truck or rail transportation is very low and well below regulatory standards. The analysis also indicated that rail shipments have lower potential radiological impacts than truck shipments. At DCPP, PG&E has proposed a blended approach using ocean barging, rail, and trucking to transport waste materials from DCPP to offsite disposal facilities. It is presumed that the potential impacts associated with transporting waste associated with the decommissioning of DCPP would be similar to, and bounded by, the impacts analyzed in the GEIS.

A report prepared by the B. John Garrick Institute for the Risk Sciences at the University of California, Los Angeles, in collaboration with PG&E, evaluated transportation risks associated with the decommissioning of nuclear power plants in general, and specifically analyzed DCPP (PG&E, 2020b). The analysis concluded that overall transportation risks were lowest for disposal strategies that relied on ocean barging. The report also noted that risks were very low in all cases analyzed, and that it would not be possible to discriminate between alternative transportation modes on the basis of radiological risks alone (see Appendix G2). Given the results described in the 2002 GEIS and the UCLA study (PG&E, 2020b), radiological risk related to the transportation of LLRW from DCPP is extremely low, and PG&E would comply with all applicable NRC and US Department of Transportation (DOT) regulations, including Federal Railroad Administration regulations and requirements. DOT published a review with guidance on the DOT Hazardous Materials Regulations (HMR) contained in 49 CFR Parts 171-185, which govern the packaging and shipment of radioactive material. Radiological materials packaged, labeled, marked, and transported in accordance with these regulations have a proven safety record. This review is found in its entirety as EIR Appendix G5, DOT 2008 Radiological Review (DOT, 2008). PG&E would use approved packaging and shipping containers for all waste shipments and would comply with state regulations enforced by the California Department of Transportation (Caltrans) and California Highway Patrol.

PG&E has also committed to implementing several other programs and plans that are not specifically limited to radiological hazards but would contribute to DCPP's ability to comply with all applicable environmental, safety, and health requirements. These plans and programs (described in Project Description Table 2-2) include:

Waste Management Program. This program includes procedures describing the disposal of radiological and non-radiological waste from DCPP. The program defines required training and provides for the packaging and transport of different types of waste in compliance with regulatory requirements.

Emergency Plan. The NRC-approved Emergency Plan for DCPP contains existing requirements for maintaining the capability to obtain off-site agency support as-needed for DCPP emergencies. NRC-approved Emergency Plans will be implemented throughout the Project commensurate with the potential radiological risks at each stage.

Site Specific Stormwater Pollution Prevention Plan (SWPPP). A site-specific SWPPP would be prepared in compliance with the State's National Pollutant Discharge Elimination System (NPDES) in support of a CGP. Erosion and sediment controls would be specified to minimize construction impacts on surface water quality and be designed specifically for the hydrologic setting of the DCPP site.

Spill Prevention, Control, and Countermeasure (SPCC) Plan. Required by 40 CFR 112 to limit the risk of oil spills through several measures including: proper storage and handling procedures, standard hazardous waste transport, training of personnel, procedures for fueling and maintaining construction equipment, and an emergency response program to ensure quick and safe cleanup of accidental spills.

Wastewater Discharge Program. The water management approach to decommissioning (which includes management of LRW) is based on the approved permit issued for DCPP power operations (NPDES CA0003751).

PG&E would also limit exposure to radiological materials by minimizing fugitive dust, as well as controlling erosion and runoff as required by the site-specific SwPPP and CGP (ACs AQ-1, BIO-3, and WQ-1). With consideration of the plans, procedures, and NRC requirements, impacts related to the release of radioactive materials during decommissioning would be less than significant (Class III).

Railyards

Pismo Beach Railyard. No radiological or hazardous waste would be shipped to this facility. No impact would occur.

SMVR-SB. During Phase 1, Class A, B, and C radioactive waste from the reactor pressure vessels and internals (as discussed in Section 2.3.10) and radiologically contaminated large components (as discussed in Section 2.3.11) may be hauled by heavy truck or heavy-haul transporter directly out of state for disposal or to the SMVR-SB site (Betteravia Industrial Park/SMVR-SB) for transport out of state via rail for disposal. This could potentially result in low level exposures to the public along transportation routes, or occupational exposures to workers and possibly soil contamination in the event of an accident or spill.

NRC evaluated the risks associated with transportation in the GEIS (NRC, 2002b), and PG&E collaborated with the B. John Garrick Institute for the Risk Sciences at UCLA to perform a comprehensive analysis of risks (including radiological) associated with transportation during decommissioning (PG&E, 2020b). Both studies found that the radiological risks associated with LLRW transportation were very low, and that doses to both workers and the public were well below NRC standards (see Appendix G2). PG&E would comply with all applicable NRC and DOT regulations, including Federal Railroad Administration regulations and requirements. PG&E would use approved packaging and shipping containers for all waste shipments and would comply with state regulations enforced by Caltrans and California Highway Patrol. Therefore, impacts related to the release of radioactive airborne concentrations to the environment during transport would be less than significant (Class III).

Phase 2

DCPP Project Site

ISFSI operations are anticipated to continue through Phase 2 and beyond but are not discussed further here because they are not part of the Proposed Project. Operation of the ISFSI would occur with or without decommissioning of the DCPP site.

As described in Section 2.3.21 *Soil Remediation,* 2.3.23 *Site Conditions at End of Phase 1*, and 2.3.19 D*ecommissioning Waste Volumes*, by the end of Phase 1 Decommissioning activities, the DCPP Unit 1 and Unit 2 areas would be decommissioned, the Discharge Structure would be removed and restored (may extend into Phase 2), and most of the other above-grade structures and below-grade structures would be demolished and decommissioned (see Section 2.3.12, *Utilities, Remaining Structures, Roads, and Parking Areas Demolition* and Figure 2-16). All LLRW (Class A, B, and C) would have been transported to disposal facilities offsite, including Energy Solutions in Clive, Utah; WCS in Andrews, Texas; and US Ecology in Idaho (see Table 2-7).

In addition, all SNF and GTCC waste would have been transferred to the ISFSI and GTCC Waste Storage Facility for long-term storage within a revised Owner Controlled Area (see Figures 2-16 and 2-17). Some site restoration activities, such as removal of utilities and ancillary structures, soil remediation, and grading and landscaping may also have been completed.

Decommissioning activities during Phase 2 would include additional soil remediation of any remaining radiological and non-radiological impacted soils, demolition of remaining utilities and structures, soil grading and landscaping, and long-term stormwater management. Because all soil remediation and other activities necessary to comply with NRC License Termination requirements would be completed during Phase 1 for the Firing Range, Power Block, Discharge Structure Area, and East Canyon Area, it is expected that Phase 2 remediation and demolition activities would generally be limited to non-radiological materials. Phase 2 would also include the completion of FSS to confirm that the DCPP site would meet the radiological requirements for NRC Part 50 facility operating license termination. Soil remediation utilizing the same techniques described in Section 2.3.21, *Soil Remediation*, would be completed for the remainder of the Part 50 licensed area.

The remaining Phase 2 activities would include:

- Grading and Landscaping (Final Site Restoration)
- Long-Term Stormwater Management
- Establishment of a Blufftop Road Segment/Coastal Trail Segment

While it is not expected that any radiological materials would be encountered during Phase 2 activities, in the unlikely event that any were discovered during the Final Status Surveys, the same industry-standard methods and techniques employed during Phase 1 would be used. Most of the technical and management controls to limit the possibility and consequences of radiological impacts described for Phase 1 activities above would remain in effect until the NRC licenses are terminated and the site released for unrestricted use. These would include, but not be limited to:

- Quality Assurance Program
- Radiological Protection Program
- Radiological and Environmental Monitoring Program
- "As Low As Reasonably Achievable" (ALARA) Program
- Spill Prevention, Control and Countermeasure Plan
- Emergency Plans

As noted in the discussion for Phase 1, as part of Phase 2 PG&E would continue to minimize fugitive dust and control erosion and runoff through the site-specific SWPPP and CGP requirements (ACs AQ-1, BIO-3, and WQ-1). With consideration of the processes and procedures defined in the various detailed safety related plans and NRC requirements, impacts related to the release of radioactive materials during Phase 2 would be less than significant (Class III).

Post-Decommissioning Operations

New Facility Operations. Following Phase 2, activities at the DCPP site associated with the Proposed Project include operation of the new GTCC Waste Storage Facility, Security Building, indoor Firing Range, and Storage Buildings. GTCC waste includes all the materials that have been irradiated during the nuclear fission process, such as the reactor itself, which would be dismantled and removed when the plant is decommissioned (DCDEP, 2022). A revised OCA would be established (see Figure 2-17), and all maintenance and surveillance activities at the GTCC Waste Storage Facility would be performed in accordance with a Radiological Protection Program designed to ensure that any exposure to the public or occupational workers would comply 66with the requirements of 10 CFR Part 20, as described in Section 4.10.4.2. Radiological impacts associated with the operation of the new GTCC facility would be less than significant (Class III).

Future Actions. Operations would include boating activities and construction and operation of the ancillary structures, parking lots, and public restroom facilities. These activities would not involve radiological materials and would be located sufficiently away from the revised OCA where radiological materials are stored. There would be no impact related to release of radioactive materials (No Impact).

Mitigation Measures for Impact HAZ-8. No mitigation measures are required.

Impact HAZ-9: Release radioactive airborne concentration to the environment greater than regulatory limits (Class III: Less than Significant).

Phase 1

DCPP Project Site

Currently, radioactive releases to the air are primarily caused by gaseous effluents containing tritium and carbon-14 associated with reactor operations (see Section 4.10.1.2.5, *Radioactive Waste Gaseous Effluent Treatment Processes*). PG&E's Radiological and Environmental Monitoring Program is designed to focus on detecting those radionuclides. As described in Section 4.10.2.2 *Radiological Materials* (in the subsections entitled "Occupational Radiation Exposure" and "Public Exposure Limits"), releases from DCPP have historically been well below applicable NRC and USEPA standards.

After the reactors shutdown in 2024 and 2025, the gaseous and liquid effluents that are the sources of these emissions would decrease and eventually cease after the dismantlement of the reactors and the SFP. As a result, radionuclide emissions are generally reduced in facilities undergoing decommissioning (NRC, 2002b). However, some emissions would continue as long as the SFP is still operating, and decontamination and demolition of major SSCs in the reactors has not been completed.

Many activities during Phase 1 of decommissioning would be similar to those that occur during normal operations and maintenance. For example, decontamination of piping and surfaces is performed in operating facilities during maintenance outages. Removal of piping or other components, such as pumps and valves, and even large components, such as heat exchangers is also common. However, some activities, such as removal of the reactor vessel or facility demolition, would be unique to decommissioning. Those activities have the potential to result in exposures to workers who are close to contaminated structures or components and provide sources and pathways for release of radioactive materials to the environment and the public that are not present during normal operation.

Decontamination and dismantlement activities would be designed to minimize or eliminate the release of airborne radiological materials to the environment. The primary potential new sources of radioactive releases during decommissioning include the contaminated materials, and airborne fugitive dust caused by demolition activities (see Section 2.3.8, *Decontamination*, and Section 2.3.9, *Building Demolition).* Methods to suppress the generation and limit the transport of airborne dust would be employed (see Impact HAZ-8) to ensure radioactive airborne releases during decommissioning would be minimized.

These technical and management controls and requirements are designed to limit radiological impacts and reduce exposure to both workers and the public, in addition to the use of the industry standard processes and procedures summarized above, and to limit the release of radioactive airborne concentrations. The numerous NRC mandated programs, plans, and procedures would ensure that decommissioning activities comply with the relevant requirements to limit radiological impacts.

As also noted for Impact HAZ-8, PG&E would minimize fugitive dust, and control erosion and runoff through the site-specific SWPPP and CGP requirements (ACs AQ-1, BIO-3, and WQ-1). Implementation of the processes and procedures defined by the various detailed safety related plans and NRC requirements, would ensure that all decommissioning activities are performed in a manner designed to reduce radiological hazards, and meet regulatory standards and requirements.

Per Section 4.10.2.2, *Radiological Materials*, historical average occupational doses at DCPP have been well below the average worker dose during operations for the decommissioning sites considered in the NRC's 2002 GEIS (PG&E, 2022a). As a result, DCPP's decommissioning collective dose estimated by PG&E (PG&E, 2022a) is expected to be well below regulatory requirements and bounded by doses experienced during typical decommissioning of US pressurized water reactors. As such, impacts related to the release of radioactive airborne concentrations to the environment would be less than significant (Class III).

Railyards

Pismo Beach Railyard. No radiological waste would be shipped to this facility. No impact would occur.

SMVR-SB. As described for Impact HAZ-8, during Phase 1 LLRW may be hauled by heavy truck or heavy-haul transporter directly out of state for disposal or to the SMVR-SB site for transport out of state via rail for disposal. In the event of an accident, this could potentially result in airborne releases to the environment.

Studies completed by the NRC (2002b) and PG&E (2020b) found that the radiological risks associated with LLRW transportation were very low, and that doses to both workers and the public were well below NRC standards (see Appendix G2). PG&E would comply with all applicable NRC and DOT regulations, including Federal Railroad Administration regulations and requirements. PG&E would use approved packaging and shipping containers for all waste shipments and would comply with state regulations enforced by Caltrans and California Highway Patrol. Therefore, impacts related to the release of radioactive airborne concentrations to the environment during transport would be less than significant (Class III).

Phase 2

DCPP Project Site

ISFSI operations are anticipated to continue through Phase 2 and beyond but are not discussed further here because they are not part of the Proposed Project (see Section 1.2.2, *ISFSI Approval and Cask Design*). Operation of the ISFSI would occur with or without decommissioning of the DCPP site.

As described for Impact HAZ-8, by the end of Phase 1 the DCPP Unit 1 and Unit 2 areas would be decommissioned, the Discharge Structure would be removed and restored (may extend into Phase 2), and most of the other above-grade structures and below-grade structures would be demolished and decommissioned. All LLRW would have been transported to disposal facilities

offsite, and all SNF and GTCC waste transferred to the ISFSI and GTCC Waste Storage Facility for long-term storage.

Decommissioning activities during Phase 2 include additional soil remediation of any remaining radiological and non-radiological impacted soils, demolition of remaining utilities and structures, soil grading and landscaping, and long-term stormwater management, as well as closure of the Intake Structure. Because all soil remediation necessary to comply with NRC License Termination requirements would be completed during Phase 1 for the Firing Range, Power Block, Discharge Structure Area, and East Canyon Area, it is expected that Phase 2 remediation and demolition activities would generally be limited to non-radiological materials. Phase 2 would also include the completion of FSS to confirm that the DCPP site would meet the radiological requirements for NRC Part 50 facility operating license termination.

In the event radiological materials are discovered during the FSS, the same industry-standard methods and techniques employed during Phase 1 would be used, as described for Impact HAZ-8, thereby limiting the possibility and consequences of radiological impacts.

As noted in the discussion for Phase 1, as part of Phase 2 PG&E would continue to minimize fugitive dust and control erosion and runoff through the site-specific SWPPP and CGP requirements (ACs AQ-1, BIO-3, and WQ-1). As such, radiological impacts would be less than significant (Class III).

Post-Decommissioning Operations

New Facility Operations. Following Phase 2, activities at the DCPP site associated with the Proposed Project include operation of the new GTCC Waste Storage Facility, Security Building, indoor Firing Range, and Storage Buildings. GTCC waste includes those wastes with concentrations of radionuclides which exceed the limits established for Class C Low-Level Radioactive Waste. For the Project, the GTCC waste inventory includes GTCC waste that has been generated throughout normal operations of the DCPP units and the GTCC waste that would be generated during RPV internals segmentation (DCDEP, 2022). A revised OCA would be established (see Figure 2-17), and all maintenance and surveillance activities at the GTCC Waste Storage Facility would be performed in accordance with a Radiological Protection Program designed to ensure that any exposure to the public or occupational workers would comply with the requirements of 10 CFR Part 20, as described in Section 4.10.4.2. The radiological impacts associated with operation of the new GTCC Facility would be less than significant (Class III).

Future Actions. Operations would include boating activities and construction and operation of the ancillary structures, parking lots, and public restroom facilities. These activities would not involve radiological materials and would be located sufficiently away from the revised OCA where radiological materials would be stored. The reuse of the site would not impact the risk of release of radioactive materials (No Impact).

Mitigation Measures for Impact HAZ-9. No mitigation measures are required.

Impact HAZ-10: Increase radioactivity concentrations in soil or groundwater to a level that exceeds decommissioning criteria (Class III: Less than Significant).

Phase 1

DCPP Project Site

Many decommissioning activities have the potential to release radionuclides into soil or groundwater that could result in radiation exposures that exceed regulatory standards and could adversely affect the health of workers and the public (NRC, 2002b). Without implementation of measures to contain or manage contaminated surfaces, airborne fugitive dust, contaminated soils, and gaseous or liquid effluents, workers or the public could be exposed to radiological materials during the excavation, transportation and disposal of contaminated structures, systems, and components (SSCs), or during cleaning of radioactively contaminated surfaces. The discussion of radiologic impacts for Impact HAZ-8 describes in detail the potential hazards and explains the methods and measures that would be utilized to ensure that radiation levels in soil or groundwater comply with NRC and USEPA standards.

After the shutdown of the reactors in 2024 and 2025, PG&E would continue the Site Characterization Study, as well as the Radiological Environmental Monitoring Program to ensure that the nature and extent of radiological materials is well understood, and to monitor for any new contamination in soil or groundwater. For example, the "wash-out" of tritium contaminated water originating from plant vents during rain events is one known process that could cause contamination. However, as described in Section 4.10.1.2.2 *Groundwater,* the levels of tritium released during these events were well below USEPA's drinking water standard. Contaminated surface water caused by decontamination or demolition activities could also create pathways to soil and groundwater. As indicated in Table 2-2, DCPP implements the NEI 07-07 Groundwater Protection Initiative (see Groundwater Protection Program Plan), and monitors several on-site observation wells, including Deep Well #2, to detect tritium or other contaminants. DCPP has not observed radioactive groundwater contamination because of power plant operations involving leaking components or piping. Studies of DCPP site hydrology indicate that any groundwater (subsurface) flow beneath the Power Block is not used as a source of drinking water. That groundwater discharges into the Pacific Ocean (PG&E, 2007a). A long-term monitoring program may be initiated prior to termination of the 10 CFR Part 50 facility operating license, if needed (PG&E, 2021c).

PG&E implements numerous NRC mandated programs, plans, and procedures to ensure that all activities comply with the relevant requirements to limit radiological impacts. These are described in more detail in the discussion for Impact HAZ-8.

As part of the Proposed Project PG&E would minimize fugitive dust, and control erosion and runoff through the site-specific SWPPP and CGP requirements (ACs AQ-1, BIO-3, and WQ-1). Implementation of the processes and procedures defined by the various detailed safety related plans and NRC requirements should ensure that all decommissioning activities are performed in a manner designed to reduce radiological hazards and meet regulatory standards and requirements. Impacts would be less than significant (Class III).

Railyards

Pismo Beach Railyard. No radiological waste would be shipped to this facility. No impact would occur.

SMVR-SB.

As described for Impact HAZ-8, during Phase 1 Class A, B, and C radioactive waste may be hauled by heavy truck or heavy-haul transporter directly out of state for disposal or to one of the two SMVR facilities for transport out of state via rail for disposal. This could potentially result in low level exposures to the public along transportation routes, or occupational exposures to workers and possibly soil or groundwater contamination in the event of an accident or spill. Studies completed by the NRC in the 2002 GEIS (NRC, 2002b) and PG&E (2020b) found that the radiological risks associated with LLRW transportation to the SMVR-SB site would be very low, and that doses to both workers and the public would be well below NRC standards (see Appendix G2). PG&E would comply with all applicable NRC and DOT regulations, including Federal Railroad Administration regulations and requirements. PG&E would use approved packaging and shipping containers for all waste shipments and would comply with state regulations enforced by Caltrans and California Highway Patrol. Therefore, impacts related to the release of radioactive concentrations in soil or groundwater during transport would be less than significant (Class III).

Phase 2

DCPP Project Site

ISFSI operations are anticipated to continue through Phase 2 and beyond but are not discussed further here because they are not part of the Proposed Project (see Section 1.2.2, *ISFSI Approval and Cask Design*). Operation of the ISFSI would occur with or without decommissioning of the DCPP site.

As described for Impact HAZ-8 discussion, by the end of Phase 1 Decommissioning activities, the DCPP Unit 1 and Unit 2 areas would be decommissioned, the Discharge Structure would be removed and restored (may extend into Phase 2), and most of the other above-grade structures and below-grade structures would be demolished and decommissioned to meet radioactivity release criteria in accordance with NRC regulations for unrestricted site use. All LLRW would have been transported to disposal facilities offsite, and all SNF and GTCC waste transferred to the ISFSI and GTCC Waste Storage Facility for long-term storage.

Decommissioning activities during Phase 2 include additional soil remediation, demolition of remaining utilities and structures, soil grading and landscaping, and long-term stormwater management. Because all soil remediation necessary to comply with NRC License Termination requirements would be completed during Phase 1, Phase 2 remediation and demolition activities would be limited to non-radiological materials. Phase 2 would also include the completion of FSS to confirm that the DCPP site would meet the radiological requirements for NRC Part 50 facility operating license termination.

In the event radiological materials are discovered during the FSS, the same industry-standard methods and techniques employed during Phase 1 would be used, as described for Impact HAZ-8, thereby limiting the possibility and consequences of radiological impacts. As part of Phase 2, PG&E would continue to minimize fugitive dust and control erosion and runoff through the site-specific SWPPP and CGP requirements (ACs AQ-1, BIO-3, and WQ-1). Impacts would be less than significant (Class III).

Post-Decommissioning Operations

New Facility Operations. Following Phase 2, activities at the DCPP site associated with the Proposed Project include operation of the new GTCC Waste Storage Facility, Security Building, indoor Firing Range, and Storage Buildings. GTCC waste includes those wastes with concentrations of radionuclides which exceed the limits established for Class C Low-Level Radioactive Waste. For the Project, the GTCC waste inventory includes GTCC waste that has been generated throughout normal operations of the DCPP units and the GTCC waste that would be generated during RPV internals segmentation (DCDEP, 2022). A revised OCA would be established (see Figure 2-17), and all maintenance and surveillance activities at the GTCC Waste Storage Facility would be performed in accordance with a Radiological Protection Program designed to ensure that any exposure to the public or occupational workers would comply with the requirements of 10 CFR Part 20, as described in Section 4.10.4.2. The radiological impacts associated with operation of the new GTCC Facility would be less than significant (Class III).

Future Actions. Marina operations, if approved under separate permit, could include boating activities and construction and operation of the ancillary structures, parking lots, and public restroom facilities. These activities would not involve radiological materials and would be located sufficiently away from the revised OCA where radiological materials are stored, pursuant to NRC regulations. There would be no impact related to the risk of release of radioactive materials (No Impact).

Mitigation Measures for Impact HAZ-10. No mitigation measures are required.

Impact HAZ-11: Expand the existing or create a ground water radioactive plume that could contaminate potable water (Class III: Less than Significant).

Phase 1

DCPP Project Site

Section 4.10.1.2.2 *Groundwater* describes current environmental and radiological conditions at DCPP related to groundwater. Section 4.11.1, *Surface Water and Groundwater Quality* also describes groundwater quality issues with a focus on non-radiological contaminants. A Groundwater Protection Program is active at DCPP in accordance with the "Industry Groundwater Protection Initiative, Final Guidance Document" prepared by the Nuclear Energy Institute (NEI) and referred to as the NEI Groundwater Protection Initiative (NEI, 2019). This program would continue during decommissioning (PG&E, 2022a). Licensees that have implemented a groundwater monitoring program consistent with the NEI Groundwater Protection Initiative are

considered by the NRC to have an adequate program for the purposes of groundwater protection (NRC, 2011).

As discussed in Section 4.10.1.2.2, *Groundwater*, tritium was detected in groundwater at DCPP and has been monitored since 2006 as part of the Radiological Environmental Monitoring Program. The low levels and location of the tritium found in groundwater at DCPP appear to be related to "wash-out" during rain events and do not indicate a leak from the SFPs or any other plant equipment. The levels of tritium were all below the USEPA drinking water standard of 20,000 picocuries per liter (PG&E, 2007a). No plant-related tritium has been detected in drinking water. PG&E plans to continue to maintain the existing radiological decommissioning records program related to groundwater monitoring required by 10 CFR 50.75(g) (PG&E, 2022a).

Until the reactors are shut down in 2024 and 2025, releases related to gaseous and liquid effluents remain plausible. After that, radionuclide emissions in gaseous and liquid effluents would decline, but other activities associated with decommissioning may create additional potential sources. For example, if water used for dust suppression in decontamination or demolition activities is not properly captured, treated, and recycled, water could come into contact with contaminated materials, and create or expand a plume of contaminated groundwater.

As part of the groundwater initiative program, PG&E conducted a review of the SSCs and related work practices that involve or could reasonably be expected to involve radiological materials and for which there is a credible mechanism for that material to reach ground water. Examples of SSCs of interest include refueling water storage tanks, if outdoors; SFPs; SFP leak detection systems; outdoor tanks; outdoor storage of contaminated equipment; buried piping; retention ponds or basins or reservoirs; and lines carrying steam.

The primary potential new sources of radioactive releases during decommissioning include the contaminated materials as they are being demolished and potential water discharge associated with demolition activities. Decontamination and dismantlement activities would be designed to minimize or eliminate the release of radiological materials to groundwater or the environment (see Section 2.3.8, *Decontamination*, and Section 2.3.9, *Demolition).* Methods to suppress dust generation and limit the contamination of groundwater would be employed (see the discussion for Impact HAZ-8).

All the technical and management programs, plans, and procedures described in detail in the discussion for Impact HAZ-8 also apply to the discussion of Impact HAZ-11. These technical and management controls and requirements are designed to limit radiological impacts and reduce exposure to both workers and the public, in addition to the use of the industry standard processes and procedures summarized above, and to limit the release of radioactive airborne concentrations. The numerous NRC mandated programs, plans and procedures would ensure that decommissioning activities comply with the relevant requirements to limit radiological impacts.

As part of Phase 1, PG&E would continue to minimize fugitive dust, and control erosion and runoff through the site-specific SWPPP and CGP requirements (ACs AQ-1, BIO-3, and WQ-1). Implementation of the processes and procedures defined by the various detailed safety related plans and NRC requirements would ensure that all decommissioning activities are performed in a

manner designed to minimize or eliminate the creation of a plume of contaminated groundwater, to reduce radiological hazards, and to meet regulatory standards and requirements. Impacts would be less than significant (Class III).

Railyards

Pismo Beach Railyard. No radiological waste would be shipped to this facility. No impact would occur.

SMVR-SB. As described for HAZ-8, during Phase 1 LLRW may be hauled by heavy truck or heavy-haul transporter directly out of state for disposal or to the SMVR-SB site for transport out of state via rail for disposal. This could potentially result in low level exposures to the public along transportation routes, or occupational exposures to workers and possibly soil or groundwater contamination in the event of an accident or spill. Studies completed by the NRC in the 2002 GEIS (NRC, 2002b) and PG&E (2020b) found that the radiological risks associated with LLRW transportation were very low, and that doses to both workers and the public were well below NRC standards (see Appendix G2). PG&E would comply with all applicable NRC and DOT regulations, including Federal Railroad Administration regulations and requirements. PG&E would use approved packaging and shipping containers for all waste shipments and would comply with state regulations enforced by Caltrans and California Highway Patrol. Therefore, impacts related to the release of radioactive concentrations that could contaminate potable water during transport would be less than significant (Class III).

Phase 2

DCPP Project Site

ISFSI operations are anticipated to continue through Phase 2 and beyond but are not discussed further here because they are not part of the Proposed Project (see Section 1.2.2, *ISFSI Approval and Cask Design*). Operation of the ISFSI would occur with or without decommissioning of the DCPP site.

As described for Impact HAZ-8, by the end of Phase 1 Decommissioning activities, the DCPP Unit 1 and Unit 2 areas would be decommissioned, the Discharge Structure would be removed and restored (may extend into Phase 2), and most of the other above-grade structures and below-grade structures would be demolished and decommissioned. All LLRW would have been transported to disposal facilities offsite, and all SNF and GTCC waste transferred to the ISFSI and GTCC Waste Storage Facility for long-term storage.

Decommissioning activities during Phase 2 would include additional soil remediation of any remaining radiological and non-radiological impacted soils, demolition of remaining utilities and structures, soil grading and landscaping, and long-term stormwater management. Because all soil remediation necessary to comply with NRC License Termination requirements would be completed during Phase 1 for the Firing Range, Power Block, Discharge Structure Area, and East Canyon Area, it is expected that Phase 2 remediation and demolition activities would generally be limited to non-radiological materials. Phase 2 would also include the completion of FSS to confirm that the DCPP site would meet the radiological requirements for NRC Part 50 facility operating license termination.

In the event radiological materials are discovered during the FSS, the same industry-standard methods and techniques employed during Phase 1 would be used, as described for Impact HAZ-8, thereby limiting the possibility and consequences of radiological impacts.

As part of Phase 2, PG&E would continue to minimize fugitive dust and control erosion and runoff through the site-specific SWPPP and CGP requirements (ACs AQ-1, BIO-3, and WQ-1). Impacts would be less than significant (Class III).

Post-Decommissioning Operations

New Facility Operations. Following Phase 2, activities at the DCPP site associated with the Proposed Project include operation of the new GTCC Waste Storage Facility, Security Building, indoor Firing Range, and Storage Buildings. GTCC waste includes all the materials that have been irradiated during the nuclear fission process, such as the reactor itself, which would be dismantled and removed when the plant is decommissioned (DCDEP, 2022). A revised OCA would be established (see Figure 2-17), and all maintenance and surveillance activities at the GTCC Waste Storage Facility would be performed in accordance with a Radiological Protection Program designed to ensure that any exposure to the public or occupational workers would comply with the requirements of 10 CFR Part 20, as described in Section 4.10.4.2. The radiological impacts associated with operation of the new GTCC Facility would be less than significant (Class III).

Future Actions. Proposed reuse operations at the Marina would include boating activities and construction and operation of the ancillary structures, parking lots, and public restroom facilities. These activities would not involve radiological materials and would be located sufficiently away from the revised OCA where radiological materials are stored, pursuant to NRC regulations. There would be no impact related to the potential risk of release of radioactive materials (No Impact).

Mitigation Measures for Impact HAZ-11. No mitigation measures are required.

Impact HAZ-12: Cause non-compliance with Federal regulations applicable to storage, use, or transfer of radiological materials (Class III: Less than Significant).

Phase 1

DCPP Project Site

The discussions of potential radiological impacts for Impact Statements HAZ-8 through HAZ-11 have focused in large part on the technical and industrial means and methods that PG&E proposes to use during the decommissioning of DCPP, and on the particular environmental media that can create radiological risks when contaminated (e.g., radioactive portions of reactor SSCs, containment buildings, etc.), as well as soil, surface water, groundwater, and air. For example, physical and chemical techniques to decontaminate and dismantle equipment, SSCs, and building have been described that would enable PG&E to decommission DCPP without exposing workers or the public to levels of radiation and/or doses that exceed NRC and USEPA standards. Most of the decommissioning activities described in Table 2-1 involve radioactive materials which could lead to noncompliance with Federal regulations. This discussion focuses not on the physical processes and procedures to be employed, but on the management controls and methods that ensure that all activities are focused on compliance with regulations.

Section 4.10.2, *Regulatory Setting*, and particularly Section 4.10.2.2, *Radiological Materials,* describe the primary federal and state laws, regulations, and policies that pertain to the Proposed Project; they are also summarized in Appendix C. In addition, PG&E has developed numerous programs, plans, and procedures to implement the requirements. These programs and plans are described in detail in the discussion for Impact HAZ-8 and are briefly summarized below.

- PG&E has implemented a **Quality Assurance (QA) Program** (PG&E, 2016a and PG&E, 2016b) that is applicable to all aspects of DCPP and DCPP ISFSI operations. The purpose of the PG&E QA Program is to provide assurance that the design, construction, and operation of DCPP is in conformance with applicable regulatory requirements.
- PG&E's **Radiological Protection Program** (PG&E, 2016c) includes numerous detailed plans and procedures that are implemented through comprehensive training and certification programs to ensure that employees are qualified and capable of conducting all operations safely and in compliance with applicable regulations. The program also includes:
  - The ***Radiological and Environmental Monitoring Program*** which monitors for radioactive contamination in the environment.
  - ***Effluents Control Program*** administered in accordance with the *Offsite Dose Calculation Manual* which regulates and monitors radioactive effluents during nuclear operations, and throughout decommissioning.
  - ***Groundwater Protection Initiative*** which establishes standards for sampling and reporting groundwater monitoring established in 2006 by Nuclear Energy Institute (see Section 4.10.1.2.2 *Groundwater*).
  - ***ALARA Program*** (NRC, 2006) which requires the reduction of radiation exposure to ALARA for site-wide activities and includes both decommissioning and routine operational activities. The program also requires that PG&E adopt reasonable measures to reduce the potential for radiation exposure to ALARA for both workers and the public.

All personnel (PG&E employees and contractors) that enter RCAs receive extensive radiological training to ensure that each person who requires access to the RCAs, or who may be involved with radiological activities, understands their responsibility to minimize their own dose and to comply with radiological protection procedures.

All nuclear activities that occur at DCPP are overseen by the NRC. The NRC has installed two resident inspectors at DCPP to conduct inspections, monitor significant work projects, and interact with plant workers and the public (NRC, 2022c). The NRC also conducts periodic, regular inspections covering the requirements contained, in part, in 10 CFR Part 73.55 include access authorization, access control, security equipment testing, security force training, inspection of physical barriers, and intrusion detection and alarm assessment monitoring systems, among other areas.

The NRC's routine inspections of power reactor security include evaluations of the licensee's ability to protect the plant from the design basis threats of radiological sabotage, theft, and diversion. These evaluations, which have been conducted since 1992, are realistic mock attacks that challenge the plant's security force and systems. Since 2004, these NRC-evaluated exercises have been fully integrated with the inspection program for physical protection.

Operators such as PG&E are also subject to inspection and evaluations of their MC&A programs. NRC regulations in 10 CFR Part 74 include general reporting requirements applicable to anyone who possesses, transfers, or receives quantities of Special Nuclear Material. NRC regulations also require licensees to keep complete records of receipt, transfer, and inventory of all Special Nuclear Material; to develop and follow written procedures that are adequate to account for and control all Special Nuclear Material possessed; and to perform periodic physical inventories.

The combination of the well-defined and documented requirements, combined with the detailed plans and programs to make sure the requirements are met (including qualifications, training, monitoring and oversight) provide a strong basis for the conclusion that regulatory requirements would be met, and the likelihood of non-compliance is less than significant (Class III).

Railyards

Pismo Beach Railyard. No radiological waste would be shipped to this facility. No impact would occur.

SMVR-SB. As described for Impact HAZ-8, during Phase 1 LLRW may be hauled by heavy truck or heavy-haul transporter directly out of state for disposal or to the SMVR-SB site (for transport out of state via rail for disposal. This could possibly result in low level exposures to the public, or occupational exposures to workers that exceed regulatory standards in the event of an accident or spill. Studies completed by the NRC in the 2002 GEIS (NRC, 2002b) and PG&E (PG&E, 2020b) found that the radiological risks associated with LLRW transportation were very low, and that doses to both workers and the public were well below NRC standards (see Appendix G2). PG&E would comply with all applicable NRC and DOT regulations, including Federal Railroad Administration regulations and requirements. PG&E would use approved packaging and shipping containers for all waste shipments and would comply with state regulations enforced by Caltrans and California Highway Patrol. Therefore, impacts related to compliance with Federal regulations applicable to the storage and transfer of radiological materials would be less than significant (Class III).

Phase 2

DCPP Project Site

ISFSI operations are anticipated to continue through Phase 2 and beyond but are not discussed further here because they are not part of the Proposed Project. Operation of the ISFSI would occur with or without decommissioning of the DCPP site.

As described for Impact HAZ-8, by the end of Phase 1 the DCPP Unit 1 and Unit 2 areas would be decommissioned, the Discharge Structure would be removed and restored (may extend into Phase 2), and most of the other above-grade and below-grade structures would be demolished and decommissioned. All LLRW would have been transported to disposal facilities offsite, and all SNF and GTCC waste transferred to the ISFSI and GTCC Waste Storage Facility for long-term storage.

Decommissioning activities during Phase 2 include additional soil remediation of any remaining radiological and non-radiological impacted soils, demolition of remaining utilities and structures,

soil grading and landscaping, and long-term stormwater management, as well as closure of the Intake Structure. Because all soil remediation and other activities necessary to comply with NRC License Termination requirements would be completed during Phase 1 for the Firing Range, Power Block, Discharge Structure Area (may extend into Phase 2), and East Canyon Area, it is expected that Phase 2 remediation and demolition activities would generally be limited to non-radiological materials. Phase 2 would also include the completion of FSS to confirm that the DCPP site would meet the radiological requirements to terminate the NRC Part 50 facility operating licenses.

In the event radiological materials are discovered during the FSS, the same industry-standard methods and techniques employed during Phase 1 would be used, as described for Impact HAZ-8, thereby limiting the possibility and consequences of radiological impacts.

As part of Phase 2, PG&E would continue to minimize fugitive dust, and control erosion and runoff through the site-specific SWPPP and CGP requirements (ACs AQ-1, BIO-3, and WQ-1). All activities would be performed in compliance with applicable regulatory requirements and impacts would be less than significant (Class III).

Post-Decommissioning Operations

New Facility Operations. Following Phase 2, activities at the DCPP site associated with the Proposed Project include operation of the new GTCC Waste Storage Facility, Security Building, indoor Firing Range, and Storage Buildings. GTCC waste includes those wastes with concentrations of radionuclides which exceed the limits established for Class C Low-Level Radioactive Waste. For the Project, the GTCC waste inventory includes GTCC waste that has been generated throughout normal operations of the DCPP units and the GTCC waste that would be generated during RPV internals segmentation (DCDEP, 2022). A revised OCA will be established (see Figure 2-7), and all maintenance and surveillance activities at the GTCC Waste Storage Facility would be performed in accordance with a Radiological Protection Program designed to ensure that any exposure to the public or occupational workers would comply with the requirements of 10 CFR Part 20, as described in Section 4.10.4.2. The radiological impacts associated with operation of the new GTCC Facility would be less than significant (Class III).

Future Actions. Marina operations, if applied for and approved under separate permit, would include boating activities and construction and operation of the ancillary structures, parking lots, and public restroom facilities. These activities would not involve radiological materials and would be located sufficiently away from the revised OCA where radiological materials are stored. There would be no impact related to the risk of release of radioactive materials (No Impact).

Mitigation Measures for Impact HAZ-12. No mitigation measures are required.

4.10.5 Cumulative Impact Analysis

Geographic Extent Context

The geographic scope of the cumulative effects analysis for hazards and non-radiological materials is limited to the DCPP site, railyards, and the routes used for transporting materials to and from these sites. The primary location is the DCPP site, which occupies a 750-acre NRC-

licensed site within PG&E's approximately 12,000-acre owner-controlled property on the California coast in central San Luis Obispo County (see Figure 2-2). The site includes both the facilities and structures that would be removed during decommissioning, and the ISFSI that would continue to operate with or without the Proposed Project. Geographic concerns were evaluated in the 2002 GEIS on decommissioning (NRC, 2002b). Geographic context may be important in the evaluation of radiological impacts, to the extent that off-site emissions may be involved. Geographic context may also be important to the evaluation of the transportation impacts, because those impacts are dependent on the number of shipments to and from the facility, the type of shipments, the distance that material is shipped, and the quantities and disposal plans for radiological and non-radiological waste.

The cumulative projects listed in Table 3-1 that are considered for cumulative impacts related to hazards and non-radiological materials include:

Diablo Canyon Power Plant

- Orano System ISFISI Modifications (#1)
- Communications Facility (#2)
- Avila Beach Drive at Highway 101 Interchange (#3)
- Flying Flags Campground (#4)
- Bob Jones Trail Construction (#5)
- Avila Beach Resort Phased Expansion Development Plan/Coastal Development Permit (#6)

Pismo Beach Railyard

- Signal at Bello and Price Canyon Road (#7)
- U.S. 101 Pismo Congestion Relief Project (#8)
- Public Safety Center (#9)
- Bello Road Paving (#10)
- Price Street Sidewalk Pavers (#11)
- Realign Frady Lane (#12)
- Storm Drain on Wadsworth from Bello to Judkins Middle School (#13)

In Vicinity of Truck Route (City of Santa Maria)

- Westgate Marketplace (#14)
- SerraMonte Townhomes (#15)
- Workforce Dormitories (#16)

SMVR-SB – Betteravia Industrial Park (County of Santa Barbara)

- Highway 101 – Betteravia Road Interchange (#17)

As discussed in Section 3.3.2, *Relevant Cumulative Projects*, only one project at the DCPP site is planned that involves radiological materials and could increase the risk of radiological exposures: Orano System ISFSI Modifications (#1). That project is the modification of the existing DCPP ISFSI to accommodate a switch from the Holtec upright SNF storage casks to the Orano horizonal storage module system. The ISFSI is an NRC regulated facility with a separate operating license than the DCPP's CFR Part 50 operating licenses for each reactor. The continued operation and

modification of the ISFSI is not part of the Proposed Project (see Section 1.2.2, *ISFSI Approval and Cask Design*).

Cumulative Impact Analysis

Hazardous Materials

Phases 1 and 2

Public access to DCPP is restricted and site activities related to on-site hazardous materials handling during decommissioning would not affect the general public during decommissioning. All hazardous material handling, transport, and offsite disposal would be subject to existing DOT and DCPP facility hazardous waste permit requirements. The transport of hazardous materials would increase temporarily during the Proposed Project. The existing DCPP Hazardous Materials Business Plan and the implementation of MM HAZ-1 **(***Facility Hazardous Waste Permit Extension*), would ensure that response strategies, including proper procedures for handling, storing, and managing accidental spills or release of hazardous materials are in place. Any potential impacts would be localized and are not expected to result in a cumulatively considerable impact.

During Proposed Project activities, as well as Phase 2 operations, hazardous materials such as vehicle fuels, oil, hydraulic fluid, and other maintenance fluids would be used and stored in staging yards and at the dock locations to support ongoing marine activities. These hazardous materials could be released during decommissioning from accidents or leaking equipment or vehicles. Spills and leaks of hazardous materials could result in soil or groundwater contamination. Leaks from equipment used offshore (barges and cranes) could adversely affect marine waters. Adherence to the DCPP SPCC Plan and SWPPP would reduce impacts related to possible hazardous waste spills, but not to a less-than-significant level. MM HWQ-1 (*Long-Term Erosion and Sediment Control Plan*) ensures any runoff from the new parking lots or restroom facilities would be controlled and treated. Additionally, as required by MM HWQ-2 (*Clean Marina Lease Provisions*), PG&E would be required to include clean marina provisions in any future lease for the Marina's use. As such, impacts from accidental releases would not be cumulatively considerable.

MM HAZ-2 (*Worker Registration/Certification*) requires workers to have the required registrations to remove asbestos, lead-based paint, and other hazardous materials. This would reduce the potential to expose workers to hazardous materials from mobilization of existing soil or groundwater contamination as workers would be trained and certified to handle hazardous materials. With the implementation of MM HAZ-2, impacts related to exposure from existing hazardous materials would not result in a cumulatively considerable impact.

During the removal of below ground structures and adjacent soil, contaminated soil and groundwater may be encountered. Contaminated soil may be encountered below asphalt, where leaks and spills have reached the underlying soil. Unanticipated soil contamination could exist in many areas of the DCPP facility and include gasoline and diesel fuel residuals, heavy metals, solvents, oil, PCBs, or other hazardous materials. While the required SWPPP would partly address the excavation, handling, and disposal of contaminated soil, additional mitigation is required to fully protect workers from unknown soil contamination. If field screening and laboratory data are not properly interpreted, environmentally contaminated soil could be improperly handled and

disposed of, resulting in additional environmental contamination or exposure of workers to non-radioactive contaminated materials. MM HAZ-3 (*Soil and Groundwater Site Characterization Work Plan*) requires the preparation of a Soil and Groundwater Site Characterization Study, which would require subsurface soil and groundwater sampling; an investigation work plan, including boring and sampling locations, to investigate where known and suspected soil and groundwater contamination may be present; Identification of the limits of contamination based on the results of the soil and groundwater testing; and a Soil Management Plan for the identification and disposal of potentially contaminated soil. Implementation of MM HAZ-3 would mitigate the Proposed Project's adverse impacts related to unknown contaminated soil and groundwater, and worker exposure to hazardous chemicals and would not be expected to result in a cumulatively considerable impact.

The DCPP site maintains compliance with the existing DCPP facility hazardous waste permit for hazardous material handling, transport, and disposal, and would be obtaining permit renewals to incorporate the Project timeframe (MM HAZ-1). The Proposed Project would not create a significant hazard to the public or the environment and would not be expected to result in a cumulatively considerable impact.

The DCPP site maintains compliance with applicable codes and standards for fire detection, suppression, and response. Phase 1 and 2 activities would not exacerbate the risk of fire because the overall activity at the DCPP site would decrease from existing operations. Implementation of the DCPP Wildfire Safety Policy and compliance with the Wildfire Mitigation Matrix, which is part of the Wildfire Safety Policy (see Section 4.17, *Wildfire*, and Table 2-2 in Section 2.2.4, *Ongoing Safety and Environmental Activities*), would minimize the risk of accidental wildfire ignition during removal, modification, and maintenance of infrastructure at the DCPP. The primary fire protection service provider at the DCPP would change from the DCFD to the CAL FIRE/County Fire, as outlined in the Decommissioning Operational Plan and the Transition Plan (See MMs PSU-1 and 2). MM PSU-1 would require PG&E to identify the applicable plans, update them to address decommissioning, record applicable specific recommendations during Project activities, and provide proof of implementation to the County. MM PSU-2 is required to maintain an acceptable level of service at the DCPP site, surrounding area, and Avila Beach. The Proposed Project would not introduce a new wildland fire hazard and would not be expected to result in a cumulatively considerable impact.

Radiological Materials

Phase 1

As noted above, the only other project involving radiological materials is proposed modifications to the ISFSI related to the dry cask storage system (Orano System ISFSI Modifications, #1). PG&E selected the Orano NUHOMS EOS System (Orano System) due to its design meeting DCPP-specific parameters such as seismic requirements, high heat load, and an 80-year design life (Stantec, 2022). Furthermore, the Orano System is expected to reduce worker exposure to radiation to half of the dosage related to the Holtec System, because Orano's system can store five more fuel assemblies in each canister and has a shorter loading and transportation duration (see Appendix G1). As such, this represents a decrease in the potential for cumulative radiation exposure. When combined with the Proposed Project, which was determined to have less than significant impacts

so long as decommissioning was performed in compliance with NRC rules, regulations, and standards, the radiological impact would not be cumulatively considerable.

Phase 2

During Phase 2, any remaining radiological materials would be removed from the DCPP site. There are no identified cumulative projects that could result in a cumulative impact and the Proposed Project's impacts are less than significant. Therefore, radiological impacts would not be cumulatively considerable.

Post-Decommissioning Operations

During Phase 2, all radiological materials would be removed from the DCPP site except for material in the GTCC Waste Storage Facility. There are no identified cumulative projects that could result in a cumulative impact and the Proposed Project's impacts are less than significant. Therefore, radiological impacts would not be cumulatively considerable.

4.10.6 Summary of Significance Findings

Table 4.10-11 presents a summary of the environmental impacts, significance determinations, and mitigation measures for the Proposed Project.

Table 4.10-11. Summary of Impacts and Mitigation Measures – Hazardous and Radiological Materials

	Impact Significance Class				
	Phase 1		Phase 2	Post-Decom	
Impact Statement	***DCPP***	***PBR/SB***	***DCPP***	***Ops/Marina***	**Mitigation Measures**
HAZ-1: Expose people to hazardous materials or create soil and/or groundwater contamination due to accidental spills or release of hazardous materials	II	III/III	II	NI/II	**HAZ-1:** Facility Hazardous Waste Permit Extension **HWQ-1:** Long-Term Erosion and Sediment Control Plan **HWQ-2:** Clean Marina Provisions
HAZ-2: Expose workers to hazardous materials from mobilization of existing soil or groundwater contamination	II	NI/NI	II	NI/NI	**HAZ-2:** Worker Registration/ Certification **HAZ-3:** Soil and Groundwater Site Characterization Work Plan
HAZ-3: Expose workers and the public to Valley Fever due to mobilization of Coccidioides fungus spores in construction related dust	III	NI/NI	III	NI/III	None required
HAZ-4: Expose sensitive receptors at existing or proposed schools to hazardous materials or hazardous waste	NI	III/NI	NI	NI/NI	None required
HAZ-5: Result in aviation hazards for people residing or working near an airport	NI	NI/NI	NI	NI/NI	None required

Table 4.10-11. Summary of Impacts and Mitigation Measures – Hazardous and Radiological Materials

	Impact Significance Class				
	Phase 1		Phase 2	Post-Decom	
Impact Statement	***DCPP***	***PBR/SB***	***DCPP***	***Ops/Marina***	**Mitigation Measures**
HAZ-6: Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan	III	III/III	III	III/III	None required
HAZ-7: Trigger a wildland fire exposing structures and people to significant risk of loss, injury, or death	II	III/III	II	NI/III	**PSU-1:** Facility Plan Updating, Tracking, and Reporting **PSU-2:** Retain the Diablo Canyon Fire Department and Emergency Facilities
HAZ-8: Release of radioactive materials during decontamination and dismantlement activities	III	NI/III	III	NI/NI	None required
HAZ-9: Release radioactive air-borne concentration to the environment greater than regulatory limits	III	NI/III	III	NI/NI	None required
HAZ-10: Increase radioactivity concentrations in soil or groundwater to a level that exceeds decommissioning criteria	III	NI/III	III	NI/NI	None required
HAZ-11: Expand the existing or create a ground water radioactive plume that could contaminate potable water	III	NI/III	III	NI/NI	None required
HAZ-12: Cause non-compliance with Federal regulations applicable to storage, use, or transfer of radiological materials	III	NI/III	III	NI/NI	None required
Cumulative Impact	Not cumulatively considerable		Not cumulatively considerable		None required

Acronyms: PBR = Pismo Beach Railyard, SB = Betteravia Industrial Park (Santa Barbara County), Post-Decom = Post-Decommissioning, Ops = Long-Term Operations, Class I = Significant and Unavoidable, Class II = Less than Significant with Mitigation, Class III = Less than Significant, Class IV = Beneficial, NI = No Impact.