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Docket Number: 21-ESR-01

Retire Diablo Canyon and Invest in Real Solutions Now ! (ERRATA)

Additional submitted attachment is included below.

WOMEN'S ENERGY MATTERS

August 19, 2022

Re: Docket No. 21-ESR-01 (*Energy System Reliability*)
Comments re: Newsom's Joint Agency Presentation August 12, 2022
Retire Diablo Canyon and Invest in Real Solutions Now !

To Governor Newsom and the Joint Agencies:

In 2018, an Historical Site Assessment Report was prepared for Diablo Canyon as part of PG&E's plans to decommission the nuclear plant.[1] The report shows that groundwater at Diablo Canyon has been contaminated with tritium; that Diablo Canyon Creek has likely been contaminated with radioactive runoff; and that sand and sediment in the waters off Diablo Canyon Cove (which PG&E refers to as "Discharge Cove") are likely contaminated with radioactive gamma emitters (e.g., Co-60, Sb-125, Cs-134, and Cs-137) and hard-to-detect radionuclides (H-3, C-14, and Sr-90).[2] PG&E's discharge structure at Diablo Canyon has been releasing diluted radioactive liquids into the cove for decades.

In the CPUC's 2021 nuclear decommissioning proceeding (A.2112007), PG&E is on record that it will not even begin to address the radiological and chemical contamination onsite at Diablo Canyon until the plant retires. Delaying shutdown delays cleanup indefinitely. The Historical Site Assessment Report presents facts that contradict the characterization of Diablo Canyon as a clean energy resource.

PG&E is not, and never has been, the prime mover in creating a reliable energy system in California that will serve us in the coming years.

In recent years, it is CCA's that have been bringing on new and sustainable energy resources, and developing strong programs that actually serve communities, as opposed to polluting them.

In recent years Community Choice Aggregators have been responsible for approximately 80% of California's Renewable Portfolio Standard ***<u>new</u>*** procurement. This has been accomplished despite the burden of having to contribute to the $1 billion + Diablo Canyon stranded asset charges each year. If the 2024/2025 retirement dates are kept in place, these exorbitant

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[1] Diablo Canyon Power Plant Historical Site Assessment Report, prepared by Black & Veatch for PG&E (June 2018).
[2] *Id.* at pp. 5-22 and 5-23.

stranded asset charges will end, and local communities will have the money to invest in true, and local solutions. The governor's plan to keep Diablo Canyon running would extend that weighted handicap indefinitely. How does this plan to financially suffocate the communities that are contributing the largest new RPS procurement serve Governor Newsom's commitment to a clean energy future?

Respectfully yours,

Jean Merrigan
Rebekah Collins
Women's Energy Matters
Fairfax, CA

DIABLO CANYON POWER PLANT
HISTORICAL SITE ASSESSMENT REPORT

JUNE 2018

Prepared for
Pacific Gas & Electric Company

Presented by
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11401 Lamar Avenue, Overland Park, KS

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Tables

Figures

GLOSSARY OF TERMS, ACRONYMS, AND ABBREVIATIONS

a/c	air conditioning
ACM	Asbestos Containing Materials
AOC	area-of-concern
AQCD	Air Quality Control District
AQMD	Air Quality Management District
AST	aboveground storage tank
CalEPA	California Environmental Protection Agency
CalRecycle	Department of Resources Recycling and Recovery
COC	(Non-Radioactive) Constituent-of-Concern
CTF	Cask Transfer Facility
CVCS	Chemical and Volume Control System
DAW	Dry Active Waste
DCA	Discharge Cove Area
DCGL	Derived Concentration Guideline Level
DCPP	Diablo Canyon Power Plant
DQO	Data Quality Objective
DRO	Diesel Range Organics
DTSC	Department of Toxic Substances Control
EPA	(U.S.) Environmental Protection Agency
EPRI	Electric Power Research Institute
FSAR	Final Safety Analysis Report
GPI	Groundwater Protection Initiative
HSA	Historical Site Assessment
HTD	Hard-to-Detect (radionuclide)
ISFSI	Independent Spent Fuel Storage Installation
kV	kilovolts
LA	License Amendment
LLD	Lower Limit of Detection
MCL	Maximum Contaminant Level
ml	milliliters
mph	miles per hour
MWt	Megawatt thermal
NEI	Nuclear Energy Institute
NOCA	North Owner Controlled Area
NPA	North Protected Area
NPDES	National Pollutant Discharge Elimination System
NRC	(U.S.) Nuclear Regulatory Commission
NSA	North Site Area
ODCM	Offsite Dose Calculation Manual
OEHHA	Office of Environmental Health Hazard Assessment
OSGSF	Old Steam Generator Storage Facility
PA	Protected Area
PAHs	Polycyclic Aromatic Hydrocarbons

PBA	Power Block Area
PCBs	Polychlorinated Biphenyls
pCi/L	picocurie per liter
PG&E	Pacific Gas & Electric Co.
ppm	parts per million
PWR	pressurized water reactor
RAM	Radioactive Material
RCA	Radiologically Controlled Area
RCRA	Resource Conservation and Recovery Act
RCS	Reactor coolant system
REMP	Radiological Environmental Monitoring Program
RMA	Radioactive Material Area
RP	Radiation Protection
RPB	Radwaste Processing Building
RVCHRP	Reactor Vessel Closure Head Replacement Project
RWQCB	Regional Water Quality Control Boards
RO	Reverse osmosis
ROC	Radionuclide-of-Concern
SDS	safety data sheet
SFP	Spent Fuel Pool
SGRP	Steam Generator Replacement Project
SOCA	South Owner Controlled Area
SPA	South Protected Area
SSA	South Site Area
STLC	Soluble Threshold Limit Concentration
SVOCs	Semi-Volatile Organic Compounds
TAL	Target Analyte List
TCLP	Toxicity Characteristic Leaching Procedure
TPH	Total Petroleum Hydrocarbons
TSCA	Toxic Substance Control Act
TTLC	Total Threshold Limit Concentration
USEPA	U.S. Environmental Protection Agency
UST	Underground Storage Tank
VCP	Voluntary Cleanup Program
VOCs	Volatile Organic Compounds
WOCA	West Owner Controlled Area

EXECUTIVE SUMMARY

The Historical Site Assessment (HSA) is an investigation designed to collect existing information describing Pacific Gas and Electric (PG&E) Diablo Canyon Power Plant (DCPP) site history from start of operations to the present time. The HSA identifies potential, likely, or known sources of radioactive and non-radioactive contamination within buildings, on plant structures, and in the site's environs based on existing or derived information. Thus, the purpose of this HSA is to document a comprehensive investigation that identifies, collects, organizes, and evaluates historical information relevant to the Diablo Canyon site.

The historical information provides the basis for classification decisions following the guidance contained in NUREG-1575, *Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)* [1]. The collection of historical information and data supports an informed decision-making process regarding the current radiological and hazardous status of structures and open land areas across the site. The collected information serves as the bases for "impacted/non-impacted" decisions regarding the radiological status of structures and open areas at the Diablo Canyon site. As defined in NUREG-1575, a non-impacted area is any area "where there is no reasonable possibility (extremely low potential) of residual contamination." An impacted area is defined in NUREG-1575 as "Any area that is not classified as non-impacted" and "Areas with a possibility of containing residual radioactivity in excess of natural background or fallout levels." For chemical (non-radiological) materials, the term "Area-of-Concern" (AOC) is used in lieu of the term "impacted."

Following identification of a radiologically impacted area, the collected historical information further serves as the bases for preliminary MARSSIM classifications as Class 1, 2, and 3 survey areas for those areas identified or assumed to remain after license termination. The impacted/non-impacted classifications, as well as the potential radionuclides-of-concern (ROCs) and identified data gaps, are used to guide and focus the planning activities for subsequent radiological site characterization efforts. Similarly, identified AOCs, and their associated contaminant-of-concern (COC) and data gaps, are used to guide subsequent non-radiological characterization efforts.

For the purpose of the HSA effort, the DCPP site was divided into nine study areas. Section 5, *Radiological Findings*, provides the details of the impact from the use of radioactive materials in each study area whereas Section 6, *Chemical Findings*, provides the analogous details from the use of chemical (non-radioactive) materials. Seven of the 9 study areas were identified as partially or totally impacted areas due to the historical and/or current use of radioactive materials. The AOCs identified by the potential or historic use of chemical (non-radioactive) materials are also identified within the 9 study areas. Data gaps in historical and current records were identified for each study area. Those data gaps are the drivers for the development of a Site Characterization Plan and associated cost estimate.

SECTION 1 PURPOSE OF THE HISTORICAL SITE ASSESSMENT

The Historical Site Assessment (HSA) is an investigation designed to collect existing information describing Diablo Canyon Power Plant (DCPP) site history from start of operations to the present time. The purpose of this HSA is to document an investigation relying on historical and current information regarding plant operation and activities to determine the potential for contamination of structures and areas at the DCPP site. Thus, this HSA identifies potential, likely, or known sources of radioactive and non-radioactive contamination based on information collected and reviewed during this effort. Appendix A provides a list of documents reviewed as part of this report.

The historical information provides the basis for classification decisions following the guidance contained in NUREG-1575, *Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)* [1]. The collection of historical information and data supports an informed decision-making process regarding the current radiological and hazardous status of structures and areas within the DCPP site boundary. The collected information serves as the bases for radiologically “impacted/non-impacted” decisions regarding the open land areas at the site. For chemical (non-radiological) materials, the term “Area-of-Concern” (AOC) is used in lieu of the term “impacted.”

As defined in NUREG-1575, a non-impacted area is any area “where there is no reasonable possibility (extremely low potential) of residual contamination.” An impacted area is defined in NUREG-1575 as “any area that is not classified as non-impacted” and “areas with a possibility of containing residual radioactivity in excess of natural background or fallout levels.” The impacted/non-impacted classifications, as well as the potential radionuclides-of-concern (ROCs) and identified data gaps, are used to guide and focus the planning activities for subsequent radiological site characterization efforts. Similarly, identified AOCs, and their associated non-radioactive constituent-of-concern (COC) and data gaps, are used to guide subsequent non-radiological characterization efforts.

SECTION 2 PROPERTY IDENTIFICATION

2.1 NAME AND ADDRESS OF PROPERTY OWNER

Units 1 and 2 at the DCPP site, located in San Luis Obispo County, CA, are owned and operated by Pacific Gas & Electric Company (PG&E).

The site address is:
Diablo Canyon Power Plant
9 miles NW Avila Beach
Avila Beach, CA 93424

2.2 BOUNDARIES OF SITE

The following description was taken from Chapter 1 of the DCPP Units 1 and 2 FSAR Update [2].

The DCPP site consists of approximately 750 acres located in San Luis Obispo County, California, adjacent to the Pacific Ocean, approximately 12 miles west southwest of the city of San Luis Obispo and roughly equidistant from San Francisco and Los Angeles. One hundred sixty-five acres of the DCPP site are located north of Diablo Creek; the remaining 585 acres are located adjacent to and south of Diablo Creek. PG&E owns all of the coastal properties located north of Diablo Creek, extending north to the southerly boundary of Montana de Oro State Park and reaching inland approximately 1.5 miles. Eureka Energy Company, a wholly owned subsidiary of PG&E, owns the coastal properties located south of Diablo Creek and reaching inland approximately 1.5 miles. In 1988, PG&E purchased approximately 4,500 acres located north of the DCPP site. This section of land consists of approximately 5 miles of coastline and reaches inland approximately 1.5 miles. The minimum distance from either reactor to the nearest site boundary on land is one-half mile.

Figure 2.2-1 shows the DCPP site boundary.

2.3 ENVIRONMENTAL SETTING

2.3.1 Topography

The following description was taken from Chapters 1 and 2 of the DCPP Units 1 and 2 FSAR Update [2, 3].

The plant site occupies a coastal terrace that ranges in elevation from 60 to 150 feet above sea level and is approximately 1000 feet wide. Plant grade is at elevation 85 feet. The seaward edge of the terrace is a near-vertical cliff. Back from the terrace and extending for several miles inland are the rugged Irish Hills, an area of steep, brush-covered hillsides and deep canyons that are part of the San Luis Mountains and attain an elevation of 1,500 feet within about a mile of the site. Access to the site is by a private road from Avila Beach, a distance of nearly 8 miles.

Topographical influences on both short-term and long-term diffusion estimates are quite pronounced in that the ridgelines east of the plant location extend at least to the average height of the marine inversion base. The implications of this barrier are (i) any material released that is diverted along the coastline will be diluted and dispersed by the natural valleys and canyons, which indent the coastline, and (ii) any material released that is transported over the ridgeline will be distributed through a deep layer because of the enhanced vertical mixing due to topographic features.

2.3.2 Geology

The following description was taken from Chapter 1 and 2 of the DCPP Units 1 and 2 FSAR Update [2, 3].

The site lies immediately southeast of the mouth of Diablo Canyon, a major westward-draining feature of the San Luis Range, and about a mile southeast of Lion Rock, a prominent offshore element of the highly irregular coastline. The terrace consists of bedrock overlain by surficial deposits of marine and nonmarine origin.

The entire area is underlain by a complex sequence of stratified marine sedimentary rocks and tuffaceous volcanic rocks, all of Tertiary (Miocene) age. Diabasic intrusive rocks are locally exposed high on the walls of Diablo Canyon at the edge of the area. Both the sedimentary and volcanic rocks have been folded and otherwise disturbed over a considerable range of scales. Surficial deposits of Quaternary age are widespread. In a few places, they are as thick as 50 feet, but their average thickness is about 20 feet over the terrace areas and 10 feet or less over the entire mapped ground. The most extensive deposits underlie the main topographic terrace. The area is characterized by several wave-cut benches of Pleistocene age. Each is thinly and discontinuously mantled with marine sand, gravel, and rubble similar to the beach and offshore deposits that are accumulating along the present coastline. Along its landward margin each bears thicker and more localized course deposits similar to the modern talus along the base of the present sea cliff. Both the ancient wave-cut benches and their overlying marine and shoreline deposits have been buried beneath silty to gravelly detritus derived from landward sources. This nonmarine cover is essentially an apron of coalescing fan deposits and other alluvial debris that is thickest adjacent to the mouths of major canyons.

Detailed exploration of the interfaces between wave-cut benches and overlying marine deposits at the site of DCPP has shown that no breaks extend across these interfaces. The facilities are located on a bedrock section with surficial deposits that formerly capped this bedrock. The surficial geologic materials at the site consisted of a thin, discontinuous base section of rubbly marine sand and silty sand, and an overlying section of nonmarine rocky sand and sandy clay alluvial and colluvial deposits. No evidence of earthquake-induced effects such as lurching, slumping, fissuring, and liquefaction have been detected. Deformation of the rock substrata in the site area may well have been accompanied by earthquake activity at the time of its occurrence in the geologic past. There is no evidence, however, of post-terrace earthquake effects in the bedrock where the power plant was constructed.

2.3.3 Hydrology

The following description was taken from Chapter 2 of the DCPP Units 1 and 2 FSAR Update [3] and Groundwater Gradient Analysis [4].

The DCPP area encompasses approximately 5 square miles and is bounded by ridges. The Site is influenced by the Pacific Ocean on the west and by local storm runoff collected from the drainage from Diablo Creek.

Topography and plant site arrangement limit flood design considerations to local floods from Diablo Creek and sea wave action from the Pacific Ocean.

Hydrological considerations at the plant site are limited to possible effects of plant operations on domestic water supplies and to the possibility of flooding. A survey of domestic water supplies in the environs shows that operation of the plant will not jeopardize any existing or planned facility

Groundwater in the region surrounding the site is either in the alluvial deposits of Diablo Creek or seeps from springs encountered in excavations at the site. Groundwater is typically seen at an elevation lower than the building structures. Data from on-site wells indicate that groundwater generally flows to the southwest, toward the Pacific Ocean from wells that tap into the fractured bedrock of the Miocene Obispo Formation. Due to limited data, the exact flow direction could not be determined without additional data and installation of monitoring wells.

2.3.4 Meteorology

The following information was taken from Chapter 2 of the DCPP Units 1 and 2 FSAR Update [3].

The climate of the area is typical of the central California coastal region and is characterized by small diurnal and seasonal temperature variations and scanty summer precipitation. The prevailing wind direction is from the northwest, and the annual average wind speed is about 10 mph. In the dry season, which extends from May through September, the Pacific high-pressure area is located off the California coast, and the Pacific storm track is located far to the north. Moderate to strong sea breezes are common during the afternoon hours of this season while, at night, weak offshore drainage winds (land breezes) are prevalent. There is a high frequency of fog and low stratus clouds during the dry season, associated with a strong low-level temperature inversion.

The coastal mountains that extend in a general northwest-to-southeast direction along the coastline affect the general circulation patterns. The wind direction in many areas is more likely a result of the local terrain than it is of the prevailing circulation. Numerous canyons and valleys, each of which has its own land-sea breeze regime, indent this range of mountains. As the air flows along this barrier, it is dispersed inland by the valleys and canyons that indent the coastal range. Once the air enters these valleys and canyons, it is controlled by the local terrain features. In areas where there are no breaks in the coastal range, the magnitude of the wind speed is increased and the variation in the wind direction decreases as the air is forced along the barrier. However, the vertical mixing and lateral meandering under the inversion are enhanced because of the irregular terrain profile and the increased mechanical turbulence due to the rough terrain. Therefore, emissions injected into the coastal regime are transported and dispersed by a complex array of land-sea breeze regimes that lead to rapid dispersion in both the vertical and horizontal planes.

Figure 2.2-1. DCPP Site Boundary

SECTION 3 HISTORICAL SITE ASSESSMENT METHODOLOGY

3.1 APPROACH AND RATIONALE

Document DCPP-TA-012, *Diablo Canyon Decommissioning Site Characterization Study (*Conceptual Revision) [4] established the objectives, Data Quality Objectives (DQOs), decision criteria, methodology, and investigation process for this HSA phase of the DCPP Site Characterization Study project. The approach and rationale for conducting the HSA followed guidance provided in NUREG-1575. The development of this HSA included assessment efforts in the following areas:

- Research and review of available documents and records.
- Reviews of available historical radiation survey data and other relevant radiological records.
- Reviews of available historical data and other records regarding non-radiological materials.
- Interviews with persons knowledgeable of the historical and current use of radioactive and chemical materials at DCPP.
- Walk-downs of the DCPP site areas and structures.

The DCPP site was divided into 9 study areas to facilitate the HSA and classification process. The criteria used to classify structures and areas within each study area were drawn from the regulatory guidance of NUREG-1575 as follows:

Non-impacted Area: Areas where there is no reasonable process for residual contamination.

Impacted Area: Any area that is not classified as non-impacted. Areas with a possibility of containing residual radioactivity in excess of natural background or fallout levels.

The use of the term “fallout levels” in the definition of an impacted area refers to residual radioactive deposition from historic weapons testing.

For non-radiological constituents, structures and areas are classified as Areas of Concern (AOCs). The criteria used to identify structures and areas within each study are identified based on the following definition:

Areas of Concern (AOCs): Locations or areas at a site where hazardous waste and/or hazardous substances (including petroleum products) have been or may have been used, stored, treated, handled, disposed, spilled, and/or released to the environment.

The impacted/non-impacted classifications guide subsequent radiological characterization survey efforts. Preliminary MARSSIM Class 1, 2, and 3 classifications may be assigned to structures and areas that are identified or assumed to remain after license termination. If assigned, the classification process will follow guidance in NUREG-1575:

Class 1 Area: Impacted areas that have, or had before remediation, a potential for radioactive contamination (based on site operating history) or known contamination (based on previous radiological surveys) above the anticipated derived concentration guideline level (DCGL), or insufficient historical information and data are available to justify a Class 2 or Class 3 designation.

Class 2 Area: Impacted areas that have a potential for radioactive contamination or known contamination but are not expected to exceed the anticipated DCGL.

Class 3 Area: Impacted areas that are not expected to contain any residual radioactivity, or are expected to contain levels of residual radioactivity at a small fraction of the anticipated DCGL, based on site operating history and previous radiological surveys.

Information collected for each area includes a description of the area and identification of structures located within its boundary, an operational history, identification of potential radiological and non-radiological contaminants, identification of potentially contaminated media, an evaluation of past and current translocation pathways, and identified data gaps to be filled by subsequent characterization surveys.

For non-radiological areas, this document follows either the California Environmental Protection Agency (CalEPA) and its departments: The Regional Water Quality Control Boards (RWQCBs, including Region 3-Central Coast), Department of Toxic Substances Control (DTSC), the Office of Environmental Health Hazard Assessment (OEHHA), Air Quality Management and Control Districts (AQMD and AQCD) and Department of Resources Recycling and Recovery (CalRecycle). In addition to state regulations, this document also follows United States Environmental Protection Agencies (USEPA's) Toxic Substance Control Act (TSCA) (40 code of federal regulations [CFR] 761).

Similar to the MARSSIM approach, potential impacts from storage, operations, or releases are evaluated using the same documents and interviews as noted above. However, for the CalEPA and USEPA, investigations focus on the potential source areas or AOCs. For the non-radiological or chemical constituents, the AOCs do not assign Classes, but rather point out the types of chemicals and how they could migrate to environmental media. The results of the chemical assessment for each AOC are presented in Section 6.0. These areas will also be used to set the baseline for areas to collect samples to confirm/deny if impacts are present.

3.2 DOCUMENTS REVIEWED

In performing the DCPP HSA, the following types of documents were reviewed:

- Annual environmental reports
- Annual effluent reports
- Licensee event reports
- 50.75g files
- Temporary waste storage locations
- Waste processing locations
- Decontamination processes and locations
- Temporary Radiation Control Area (RCA) boundaries
- Historical changes to RCA boundaries
- Locations of soil remediation
- Nuclear Regulatory Commission (NRC) inspection reports & other regulator communications
- Surface and sub-surface sampling records for remediation events
- Locations of temporary Radioactive Material Areas (RMAs)
- Groundwater data
- Nuclear Energy Institute (NEI) 07-07 risk-ranking report
- NEI 07-07 groundwater protection program
- DCPP Offsite Dose Calculation Manual (ODCM)
- Conditions Reports (i.e., Action Requests and Notifications) for spills, off-normal events, and releases to the environment
- Anecdotal evidence based on process knowledge developed from interview

3.3 PROPERTY INSPECTIONS

In February 2018, site walk-downs were conducted to observe and identify (i) current site conditions, (ii) environmental areas and their associated structures and systems, (iii) locations of historical events, (iv) locations of historical temporary RCAs and RMAs, (v) radioactive material transit routes, (vi) radiological and non-radiological waste storage locations, (vii) chemical storage areas, and (viii) practical boundaries for the survey areas.

3.4 DCPP PERSONNEL INTERVIEWS

In addition to the record reviews and site reconnaissance walk-downs, DCPP employees were interviewed for anecdotal information and their historical insights. Appendix B provides a summary of the individuals contacted and interviewed regarding historical operations and events.

SECTION 4 HISTORY AND CURRENT USAGE

4.1 HISTORY

The following description was taken from Chapter 1 of the DCPP Units 1 and 2 FSAR Update [2].

> NRC issued a low power-operating license for Unit 1 on September 22, 1981. PG&E voluntarily postponed fuel loading due to the discovery of design errors in the annulus region of the containment structure. Subsequently, the NRC suspended portions of the license on November 19, 1981, pending completion of an Independent Design Verification Program.
>
> After completion of redesign and construction activities in November 1983, the NRC reinstated the fuel load portion of the Unit 1 low power-operating license. On April 19, 1984, the NRC fully reinstated the low power-operating license, which included low power testing. The Unit 1 full power-operating license was issued on November 2, 1984. Commercial operation for Unit 1 began on May 7, 1985, with a license expiration date of April 23, 2008.
>
> The NRC issued a low power-operating license for Unit 2 on April 26, 1985. Unit 2 fuel loading was completed on May 15, 1985. A full power-operating license for Unit 2 was issued on August 26, 1985. Unit 2 commercial operation began on March 13, 1986, with a license expiration date of December 9, 2010.
>
> In March 1996, the NRC approved license amendments extending the operating license for Unit 1 until September 22, 2021, and for Unit 2 until April 26, 2025. In July 2006, the NRC approved license amendments extending the operating license for Unit 1 until November 2, 2024, and for Unit 2 until August 26, 2025.
>
> In October 2000, the NRC approved a license amendment (LA) 143 to increase the Unit 1 rated reactor thermal power from the original value of 3,338 MWt to 3,411 MWt to increase production and be consistent with Unit 2. LA 143 also documented the evaluation performed to revise the net contribution of heat to the reactor coolant system (RCS) from nonreactor sources (primarily pump heat) to a nominal value of 14 MWt and established a NSSS power outlet of 3,425 MWt for both Unit 1 and Unit 2.

Over the operating years, the DCPP site experience several radiological events and spills of radioactive materials within the yard of the Protected Area (PA), particularly on and near the solidification pad, and within buildings located inside the PA. The release of a small amount of contaminated water (i.e., 200 milliliters (ml)) associated with the movement of the Unit 1 reactor vessel head from the PA to the Old Steam Generator Storage Facility (OSGSF) is the only radioactive spill recorded for a location outside the DCPP PA.

Temporary Radioactive Material Areas (RMAs) were frequently established in locations east, south and west of the PA to support storage of containerized radioactive materials and contaminated equipment.

Section 5 provides discussions regarding the impact of historic use of radioactive materials within the boundary of the DCPP site. Section 6 provides discussions regarding the impact of historic use of (non-radiological) chemical constituents within the boundary of the DCPP site.

4.2 CURRENT USAGE

The DCPP site is currently an operating nuclear power site. Units 1 and 2 are both operating reactors with licenses to continue operations until 2024 and 2025, respectively.

4.3 ADJACENT LAND USAGE

The San Luis Range, attaining a height of 1,800 feet, dominates the region between the site and US Route 101. This upland country is used to a limited extent for grazing beef cattle and, to a very minor extent, dairy cattle. The terrain east of US Route 101, lying in the mostly inaccessible Santa Lucia Mountains, is sparsely populated with little development. A large portion of this area is included within the Los Padres National Forest [3].

SECTION 5 RADIOLOGICAL FINDINGS

The DCPP site was divided into 9 study areas as a convenient approach for sorting historical radiological information. Figure 5-1 shows the orientation of the 9 study areas within the DCPP site boundary.

Seven of the 9 study areas contain impacted areas and/or structures based on historical radiological events, use and/or storage of radioactive materials, or known or potential presence of residual radioactive materials. The North Site Area (NSA), approximately 625,000 m^2, and South Site Area (SSA), approximately 1,628,000 m^2, are identified radiologically non-impacted areas. The NSA and SSA are shown in Figure 5-1. Figure 5-1 also shows the boundaries of the 7 study areas in which radiologically impacted structures and areas were identified.

Table 5.1-1. Study Areas Containing Impacted Structures and/or Areas

Study Area	Code	Approximate Area (m^2)
North Owner Controlled Area	NOCA	259,000
South Owner Controlled Area	SOCA	249,600
West Owner Controlled Area	WOCA	207,400
Discharge Cove Area	DCA	115,000
North Protected Area	NPA	66,500
South Protected Area	SPA	53,400
Power Block Area	PBA	22,300

The radiological history and bases for all impacted classifications are provided in the sub-sections below. Discussions regarding non-radiological (chemical) impacts across the DCPP site are provided in Section 6.

Note: the use of "north" as a direction throughout this section refers to "plant" north rather than "true" north. Map illustrations throughout this report are oriented with true north at the top of the page. Area descriptions throughout this report rely on plant north to orient the reader to described relative positions and area boundaries. A plant north vector arrow is provided in the legend of each map illustration.

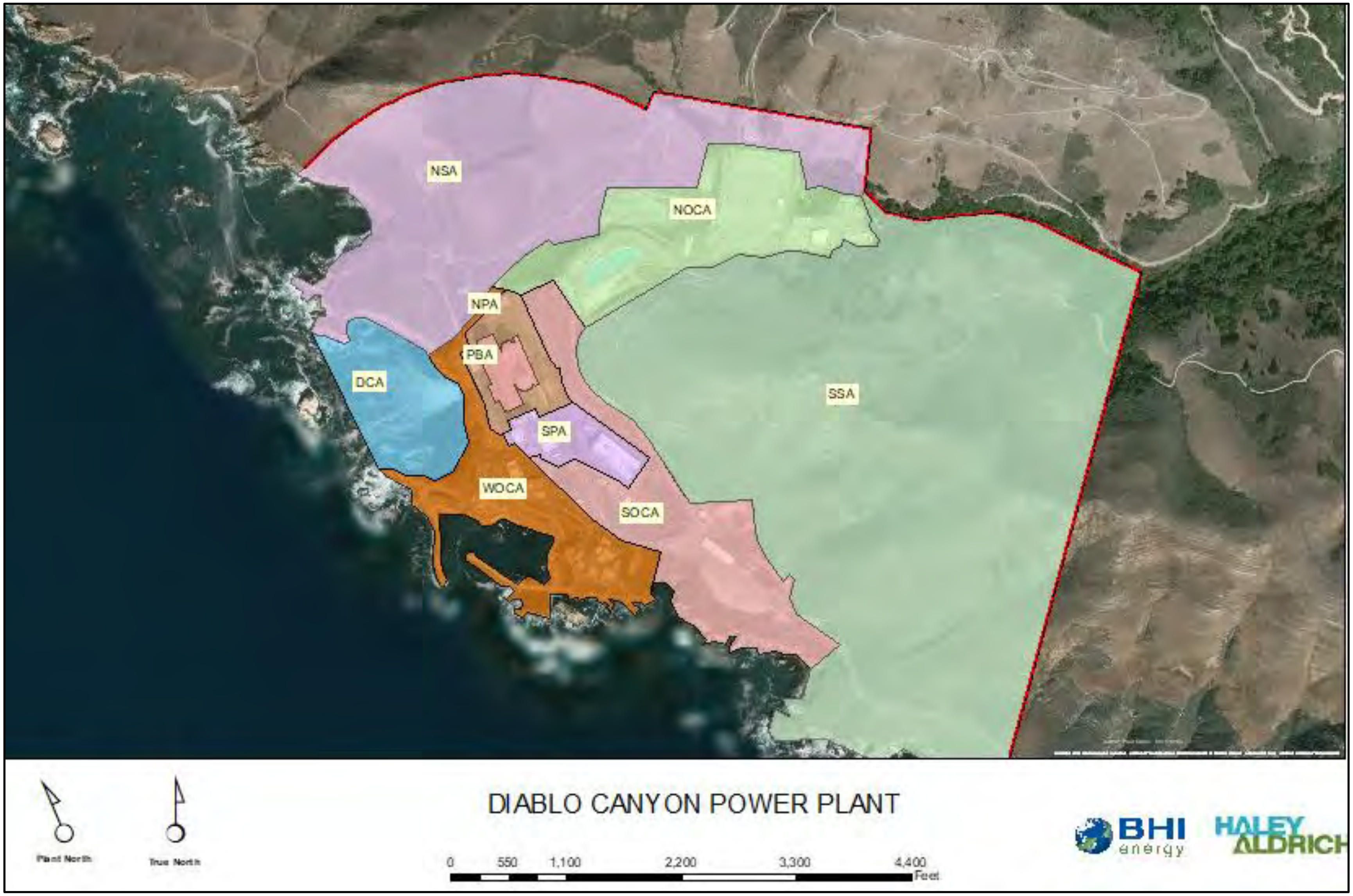

Figure 5-1. Division of the DCPP Site into Study Areas

5.1 NORTH OWNER CONTROLLED AREA

Description and Historical Use

The North Owner Controlled Area (NOCA) at Diablo Canyon Power Plant is a radiologically impacted area that encompasses approximately 259,000 m^2. It includes Old Steam Generator Storage Facility (OSGSF), Waste Holding and Treatment (WHAT) Facility, Independent Spent Fuel Storage Installation (ISFSI), Raw Water Reservoirs, 230 kV Switchyard, 500 kV Switchyard, Make Up Water System and other out buildings, Tri-Bar Flats Area, Scaffold Laydown Area, and a Spoils Area. Diablo Canyon Creek runs generally east to west through the area. The NOCA is bounded on the north, east, and south by non-impacted areas. To the west, the NOCA abuts the SOCA and NPA.

The area contains one permanent radiological controlled area (RCA), the Independent Spent Fuel Storage Installation (ISFSI) pad. This facility is expected to remain onsite until the Department of Energy accepts used fuel and greater than class C wastes.

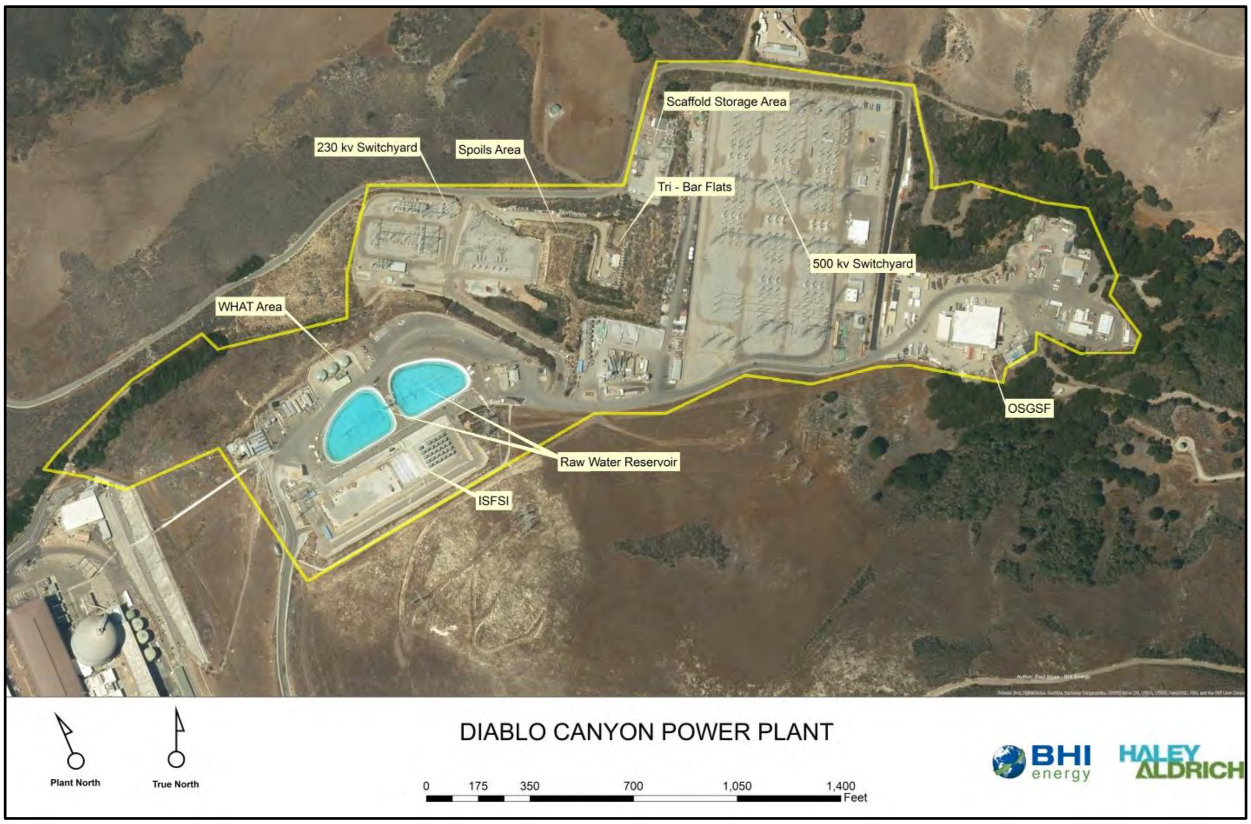

Figure 5.1-1. Structures and Areas within the NOCA

5.1.1 Old Steam Generator Storage Facility

The Old Steam Generator Storage Facility (OSGSF) is a concrete structure designed to contain the eight old steam generators and two old reactor heads. The gravel area immediately surrounding the OSGSF was used to store radioactive material (RAM) in strong tight containers. There are 4 drains that collect water from around the OSGSF and direct it to Diablo Canyon Creek, located under and adjacent to the 500 kilovolts (kV) switchyard.

A portion of the heavy haul route resides inside the NOCA. The heavy haul route, which was the transport path for the old steam generators and old reactor heads to the OSGSF, runs along the south end of the NOCA. It enters the NOCA from the SOCA, runs adjacent to the ISFSI and Raw Water Reservoirs, past the 500kV switchyard to the OSGSF. The heavy haul route is currently used to move fuel casks to the ISFSI pad.

With the exception of the unit 1 reactor head, all radioactive components stored in the OSGSF were free of loose surface contamination when placed in building. After the movement of the old Unit 1 reactor head, a leak from the reactor head was identified when it was staged outside the OSGSF. Based on information obtained during personnel interviews, radiation protection (RP) personnel who escorted and monitored the reactor head package during the move did not observe any leaks during the move. However, a small amount of contaminated water (approximately 200 ml) leaked from the reactor head while it was staged in the outside area on the south side of the OSGSF, resulting in a localized area of contaminated soil (<1ft^2). RP personnel removed the localized ground contamination and disposed of it as radwaste. In addition, RP personnel performed a radiation survey of the travel path in the vicinity of the OSGSF. No additional contamination was found during that survey, indicating that the leak was most likely limited to the initially identified localized area. This event also resulted in contamination of the transport vehicle (200,000 dpm/100 cm^2). The transport vehicle was covered and placed into Vault 26 of the Radwaste Building, and then decontaminated inside the vault. The response actions for the unit 1 head included sealing the leak and decontamination prior to placement in the OSGSF.

Information obtained during personnel interviews revealed that the metal components (primarily the reactor heads) stored inside the OSGSF are leaching tritium, resulting in significant amounts of tritium within the structure. This raises the potential for volumetric contamination of the building concrete.

Known and Potential Radiological Contaminants

Potential ROCs for the OSGSF include radionuclides associated with solid waste as identified in annual effluent reports, such as gamma emitters (e.g., Co-60, Cs-134, and Cs-137) and hard-to-detect (HTD) radionuclides (e.g., H-3, Fe-55, Ni-63, Sr-90, and Tc-99). Long-lived reactor coolant radionuclides may be present from component leakage in OSGSF. This list of potential ROCs may be revised based upon more definitive scoping and characterization data.

Contaminated Media

Potentially contaminated media include:

- Gravel/crushed stone
- Soil
- Concrete

Impacted/Non-Impacted Classification

The Old Steam Generator Storage Facility and adjacent outside areas are impacted based on historical events and storage of radioactive materials during operating years.

Preliminary MARSSIM Classification

The building is expected to be removed but the footprint for the building is preliminarily classified as MARSSIM Class 1 and the area surrounding it where RAM was stored along with the Heavy Haul Path are preliminarily classified as MARSSIM Class 3.

Data Gaps

- Samples of OSGSF concrete for tritium
- Radiation survey of the floor for any further leakage from heads
- Radiation surveys around building biased to where leak occurred
- Radiation survey and soil samples of Diablo Canyon Creek bed where drains from around the building discharge into the creek
- Radiation survey/sampling of the heavy haul travel path

5.1.2 Waste Holding and Treatment System Facility

The Waste Holding and Treatment (WHAT) System is designed to collect, treat, and discharge waste water that exceeds either the capacity or the quality requirements for discharge via the oily water separator from the Turbine Building Sumps. It consists of three 125,000-gallon tanks and treatment system designed for chemical addition to the tanks for decanting, filtration, and oil removal. Discharge from the WHAT system is via the outfall, Unit 1 Turbine Building sump, or to a tanker.

In 2017, Co-60 was identified in the sludge from the WHAT tank. In addition, the water received from the oily water separator has the potential to contain tritium because of input flow received from the turbine building sumps. There are no documented radiological events involving the WHAT system.

The WHAT area has a sump that normally discharges back to the WHAT tanks. However, during periods of heavy rains, Operations may discharge the sump to the parking lot located east of the WHAT area. This water flows east until it encounters a letdown drain line that runs to the south side of the 230 kV switchyard. The water then flows west until it reaches a pipe that directs all flow to the Diablo Canyon Creek where it emerges from under the switchyards. Radiological surveys are not performed for the WHAT area sump.

Known and Potential Radiological Contaminants

Potential ROCs for WHAT include radionuclides associated with solid waste as identified in annual effluent reports, such as gamma emitters (e.g., Co-60, Cs-134, and Cs-137) and HTD radionuclides (e.g., H-3, Fe-55, Ni-63, Sr-90, and Tc-99). This list of potential ROCs may be revised based upon more definitive scoping and characterization data.

Contaminated Media

Potentially contaminated media include:

- Underlying soil
- Concrete
- Sediments

Impacted/Non-Impacted Classification

The WHAT area is an impacted area based on historical activities and storage of radioactive materials during operating years.

Preliminary MARSSIM Classification

A MARSSIM class is not assigned to the WHAT System because all tanks and buildings are expected to be removed during decommissioning.

Data Gaps

- Radiological surveys for the WHAT area sump
- Concrete samples
- Sediment samples
- Soil sample analyses

5.1.3 Independent Spent Fuel Storage Installation

The Diablo Canyon Independent Spent Fuel Storage Installation (ISFSI) includes the storage pads, Cask Transfer Facility, onsite transporter, and dry cask storage system. The ISFSI system will remain in place under its own license and is not considered part of this study.

5.1.4 Raw Water System, Switchyards, Secondary FLEX Storage Area and Outbuildings

The Raw Water System consists of two reservoirs, each with a capacity of 2.5 million gallons. The Raw Water System receives water primarily from the Sea Water Reverse Osmosis system. The Raw Water Reservoir may also receive water from the Pretreatment System, which has a multimedia filter and chlorination injection to minimize algae growth and fouling of filters with slime. These systems constitute the Makeup Water System located near the reservoir. The Raw Water System also includes the well water system, consisting of a 100,000 gallon tank, a 13,000 gallon tank, and the drinking and domestic water system, which includes a processing unit and 18,000 gallon tank.

The 230 kV and 500kV Switchyards within the NOCA serve as part of the transmission and distribution system. The switchyards received the electrical power output from the generating station main-transformers and direct the power to the transmission system. There was no history of use or storage of radioactive materials, or any radioactive system within the switchyard.

The secondary FLEX storage area is used to store equipment to support the plant as mandated by lessons learned from the Fukushima event. The other outbuildings within the NOCA include the Vehicle Maintenance Shop, Document Storage Facility, and a small document warehouse. Use and/or storage of radioactive materials did not occur in these buildings.

Known and Potential Radiological Contaminants

None.

Contaminated Media

None.

Impacted/Non-Impacted Classification

Raw Water System, Switchyards, Secondary FLEX Storage Area, and Outbuildings are non-impacted building and areas based on historical activities.

Preliminary MARSSIM Classification

MARSSIM classification is not applicable to non-impacted buildings and areas.

Data Gaps

None.

5.1.5 Tri-Bar Flats Area, Scaffold Laydown Area and Spoils Area

The Tri-Bar Flats Area is used for general storage and as a laydown area. It uses compacted soil as a base.

The Scaffold Laydown Area is used for general storage. A concrete pad was built on the south side specifically for containerized RAM. Documentation shows that RAM storage was authorized, but interviewees reported that it was never used for that purpose.

The Spoils Area was used as a disposition site for excavated soil and debris from various construction projects. Based on information obtained during personnel interviews, soil removed from the 115-ft east yard area within the RCA was placed there. However, before placement in the Spoils Area, the soil was assayed to effluent lower limits of detection (LLDs) and released from the RCA. This provides confidence that residual radioactivity, if present, would be in very low concentrations.

Rainwater runoff from these areas flows to a storm drain that is routed through a pipe under the 230 kV switchyard and discharges into Diablo Canyon Creek, which raises the potential for a radiological impact to the Creek.

Known and Potential Radiological Contaminants

Potential ROCs for Tri-Bar Flats, Scaffold Laydown Area and Spoils Area include radionuclides associated with solid waste as identified in annual effluent reports, such as gamma emitters (e.g., Co-60, Cs-134, and Cs-137) and HTD radionuclides (e.g., H-3, Fe-55, Ni-63, Sr-90, and Tc-99). This list of potential ROCs may be revised based upon more definitive scoping and characterization data.

Contaminated Media

Potentially contaminated media include:

- Gravel/crushed stone
- Underlying soil
- Sediment

- Concrete

Impacted/Non-Impacted Classification

Tri-Bar Flats, Scaffold Laydown Area, and Spoils Area are impacted areas based on historical activities and low potential to contain residual radioactivity from previous operating years.

Preliminary MARSSIM Classification

Tri-Bar Flats, Spoils Area, and Scaffold Laydown Area are preliminarily classified as MARSSIM Class 3 due to the potential for containing low concentrations of plant-related radioactivity.

Data Gaps

- Radiation survey data of Scaffold Laydown pad
- Radiation surveys of Spoils and Tri-Bar Flats Area
- Surface soil and sediment sample analyses
- Sub-surface soil samples in the spoils area

5.1.6 Open Land Areas

Open Land areas include Diablo Canyon Creek vicinity, which runs east to west through the NOCA, and concrete pads around the Raw Water Reservoirs. Diablo Canyon Creek is routed underground at the 500-kV switchyard pad and emerges west of the 230-kV switchyard. The potential for contamination in Diablo Canyon Creek is discussed in the previous sections. The concrete pads at the Raw Water Reservoirs were used to store containerized radioactive materials.

Known and Potential Radiological Contaminants

Potential ROCs for the Open Land Area include radionuclides associated with solid waste as identified in annual effluent reports, such as gamma emitters (e.g., Co-60, Cs-134, and Cs-137) and HTD radionuclides (e.g., H-3, Fe-55, Ni-63, Sr-90, and Tc-99). This list of potential ROCs may be revised based upon more definitive scoping and characterization data.

Contaminated Media

Potentially contaminated media include:

- Soil
- Sediment
- Concrete

Impacted/Non-Impacted Classification

The Open Land Area is an impacted area based on historical activities and storage of radioactive materials during operating years.

Preliminary MARSSIM Classification

The Diablo Canyon Creek and the concrete pads are classified preliminarily as MARSSIM Class 3 due to a potential (although low) for residual radioactivity.

Data Gaps

- Radiation survey data
- Concrete sample analyses
- Sediment sample analyses
- Soil sample analyses

5.2 SOUTH OWNER CONTROLLED AREA

Description and Historical Use

The South Owner Controlled Area (SOCA) occupies approximately 249,600 m^2 and includes Diablo Canyon/Shore Cliff Road, Reservoir Road, Warehouse "B", the Security Training Building, Firing Range, and Parking Lots 1, 6, 7, and 8. Most of the area surrounding buildings is asphalt-covered; however, there are areas covered by vegetation, riprap, and sand/gravel. A large portion of the SOCA lies within the southeast sector, which is a predominant downwind sector for gaseous effluent, and therefore may be subject to impact from effluent deposition or rainout events. Figure 5.2-1 shows the major structures and open land areas within the SOCA.

Figure 5.2-1. Structures and Areas within the SOCA

5.2.1 Parking Lot 1 and Vicinity

Parking Lot 1 is located along the western side of Diablo Canyon/Shore Cliff Road. To the West it drops off through undisturbed chaparral covered cliffs to the ocean. The surface of Lot 1 is a combination of gravel and asphalt paving, although it was unpaved for most of its existence. It is currently used to accommodate the increased vehicle parking needs during Unit outages and as a laydown area for some equipment. The area has a history of use as a temporary storage location for radioactive materials during major evolutions at DCPP, such as the Steam Generator Replacement Project (SGRP) and the Reactor Vessel Closure Head Replacement Project (RVCHRP).

Temporary Radioactive Materials Areas (RMAs) were frequently established in Lot 1 and in the turnout area directly across Diablo Canyon/Shore Cliff Road to store containers of outage-related radioactive materials and to stage radioactive shipments. No evidence was uncovered that would indicate any work activity involving the material other than storage. There were no records of leakage or spread of radioactive material as a result of container failure. This was supported by information obtained during personnel interviews. However, radioactive contamination surveys could not be located to indicate the as-left condition once the temporary RMAs were removed. Only incidental radiation surveys were located, such as #00361 performed on 1/29/2003 showing near background direct exposure rates from a flatbed truck in Lot 1 containing a radioactive container.

It was revealed through personnel interviews that soil excavated from the East side of the Protected Area to support the SGRP was relocated to the Lot 1 area. That excavated material was analyzed using effluent lower limits of detection (LLDs), which provides confidence that, if present, the concentrations of any residual plant-related radioactivity in the transferred soil would likely be below the NRC radiological criteria for unrestricted use (10CFR20.1402).

A paint and sandblast area was located on the turnout East of Parking Lot 1. However, there is no evidence that radiologically contaminated equipment was processed there. That area has since been paved with asphalt and is currently used to stage tankers for sewage sludge removal.

Known and Potential Radiological Contaminants

Potential ROCs are long-lived radionuclides associated with Unit operations, low-level waste, and contaminated equipment (e.g., Sr-90, Ni-63, Co-60, and Cs-137), and potential rainout from effluent releases (e.g., H-3, C-14). This list of potential ROCs may be revised based upon more definitive characterization data.

Contaminated Media

Potentially contaminated media include:

- Asphalt
- Soil
- Gravel/sand

Impacted/Non-Impacted Classification

Parking Lot 1 and its local vicinity are classified as impacted due to the history of temporary RMAs and the potential (although low) for residual radioactive contamination from storing radioactive materials.

Preliminary MARSSIM Classification

Parking Lot 1and its vicinity are preliminarily classified as MARSSIM Class 3.

Data Gaps

- Radiological surveys of as-left conditions for temporary RMA locations
- Analytical data for soil samples from unpaved open land areas in the vicinity of Lot 1
- Analytical data for asphalt and underlying soil samples from Lot 1
- Analytical data for asphalt and underlying soil samples from the turnout area

5.2.2 Warehouse B (Building 113)

Warehouse B (Building 113) was recently remodeled in 2017. The entire structure was removed and replaced. Historically, RMAs were frequently established in the original warehouse structure to support storing and staging radioactive material containers. In addition, radiography sources were stored there during the SGRP. Information obtained during the HSA indicates that containerized radioactive materials were only stored in Warehouse B. There were no records found that suggested the stored containers leaked or resulted in the spread of radioactive contamination inside Warehouse B. However, radioactive contamination surveys showing the "as-left" condition once the temporary RMAs were removed could not be located. Moreover, survey records documenting the final radiological status of the building before remodeling to its present state were not found during this HSA.

The only remaining original construction is the concrete pad in the existing Warehouse B area. The new building now houses Access Authorization and Fitness-For-Duty in the southern end, and the Fire Station on its northern end. The middle portion remains designated as Warehouse B and is used for storage of Fukushima FLEX equipment.

Known and Potential Radiological Contaminants

Potential ROCs are long-lived radionuclides associated with contaminated equipment, and radiography sources, such as H-3, C-14, Sr-90, Ni-63, and Cs-137.

Contaminated Media

Potentially contaminated media include:

- Gravel/crushed stone
- Underlying soil
- Building materials
- Concrete

Impacted/Non-Impacted Classification

The interior portion of Warehouse B used for Fukushima FLEX equipment storage is classified as an impacted structure due to its history of temporary RMAs. The remainder of the building interior is classified as non-impacted. The exterior building surface has a low potential impacted via effluent deposition or rainout.

Preliminary MARSSIM Classification

A MARSSIM classification is not assigned to Warehouse B because its assumed future is demolition and disposition as waste.

Data Gaps

- "As-left" radiation survey data
- Analytical data for samples from the concrete pad.

5.2.3 Parking Lots 6, 7, 8, and Roadways

Parking Lots 6, 7, and 8, Diablo Canyon/Shore Cliff Road and Reservoir Road are all paved open land areas.

Parking Lot 6 is located along the East side of Diablo Canyon Rd and extends northward to the Protected Area Access Building (Building 105B). There are no records or evidence of use or storage of radioactive materials.

Parking Lot 7 is located on an elevated bluff eastward of Lot 6. Several structures are located on the east side of Lot 7. There are no records indicating the use or storage of radioactive materials in any of those office or storage buildings.

A portion of the soils excavated from the East side of the Protected Area to support the SGRP was relocated to Lot 7. Information obtained during this HSA indicate that the excavated soil was analyzed using effluent LLDs, which provides confidence that, if present, the concentrations of any residual plant-related radioactivity in the relocated soil would likely be below the current NRC radiological criteria for unrestricted use (10CFR20.1402). It was noted that the Lot 7 buildings pre-dated the movement of the potentially contaminated fill into Lot 7.

Radiation Survey #01525 performed on 3/2/2008 shows a temporary RCA/RMA that was established in northwest portion of Lot 7 to allow temporary staging of Steam Generator 2-2 during its transport to the Old Steam Generator Storage Facility (OSGSF.) The survey documents only direct radiation levels at the established RCA/RMA boundary. Records of radioactive contamination surveys documenting the as-left condition for the temporary RCA/RMA in Lot 7 were not found during this HSA.

Parking Lot 8 is located on a further elevated bluff east of Lot 7. Additional outage parking is provided in a small paved lot between Lots 7 and 8 and Building 113. There are no records indicating the use or storage of radioactive materials in Lot 8 or the overflow parking area.

Diablo Canyon/Shore Cliff Road provides access to DCPP and terminates at the Units' Protected Area boundary. Reservoir Road intersects with Diablo Canyon/Shore Cliff Road, proceeds east and then north to the NOCA. The travel path used during the SGRP and RVCHRP from the Units to the NOCA leaves the Protected Area into Parking Lot 6, skirting Parking Lot 7, turns eastward toward Reservoir Road, then proceeds northward up the grade to NOCA.

Based on information obtained during personnel interviews, RP personnel escorted and monitored movement of radioactive materials, such as the reactor heads, along the heavy haul route. While there is no evidence of any leakage of radioactive material along the travel path within the SOCA, Radiation and Contamination Survey #12816, performed 10/26/2010, showed leakage from the Unit 1 Old Reactor Vessel Closure Head after being staged in the NOCA. Records documenting surveys for the portion of the heavy haul route within the SOCA following discovery of the leak at the OSGSF are not available.

In addition, radioactive contamination surveys documenting the "as-left" conditions after the temporary RCA/RMA in Lot 7 was removed are not available.

Known and Potential Radiological Contaminants

Potential ROCs are long-lived radionuclides associated with Unit operations, low-level waste, and contaminated equipment (e.g., Sr-90, Ni-63, Co-60, and Cs-137), and potential rainout from effluent releases (e.g., H-3, C-14). This list of potential ROCs may be revised based upon more definitive characterization data.

Contaminated Media

Potentially contaminated media include:

- Asphalt
- Soil
- Gravel/sand

Impacted/Non-Impacted Classification

Parking Lots 6 and 8, and the Lot 7 storage/office structures, and roadways other than the heavy haul route are classified as impacted solely due to the potential (although low) effluent deposition or rainout. Parking Lot 7 and the heavy haul route (i.e., the travel path during the SGRO and RVCHR projects) are also classified as impacted based on historic storage and/or movement of radioactive materials.

Preliminary MARSSIM Classification

Parking Lot 7 and the SGRO and RVCHR projects travel paths are classified as MARSSIM Class 3.

Data Gaps

- Radiation surveys for “as left” conditions
- Analytical data for soil samples
- Analytical data for asphalt samples
- Analytical data for concrete samples

5.2.4 Unpaved Open Land Areas

Throughout the SOCA are several unpaved open land areas covered in gravel, soil with grass or chaparral, and riprap. There are no records that any of those unpaved open land areas was involved in the use or spread of radioactive material. However, rainout of plant effluents may have resulted in deposition of radioactive contamination because the SOCA is relatively close to the gaseous effluent discharge points within a predominant downwind sector.

Known and Potential Radiological Contaminants

Potential ROCs are those associated with gaseous and particulate effluent, such as H-3, C-14, and Co-60.

Contaminated Media

Potentially contaminated media include:

- Soil
- Gravel/sand

Impacted/Non-Impacted Classification

The open land areas within the SOCA are classified as impacted solely due to the potential effluent deposition or rainout.

Preliminary MARSSIM Classification

The open land areas within the SOCA are classified preliminarily as MARSSIM Class 3.

Data Gaps

- Analytical data for soil and gravel/sand samples

5.3 WEST OWNER CONTROLLED AREA

Description and Historical Use

The West Owner Controlled Area (WOCA) occupies approximately 207,400 m^2 and includes primarily areas west of Diablo Canyon/Shore Cliff Rd. It includes Area 10, the Intake area, the Training Building, the NPG Learning Center/Maintenance Shop Building, and Parking Lots 2, 3, 4a, 4b, and 5. The area continues along the western edge of the Protected Area and extends north and east to include the terminal portion of Diablo Canyon Creek. Figure 5.3-1 shows the major structures and open land areas within the WOCA.

Figure 5.3-1. Structures and Areas within the WOCA

5.3.1 Area 10 – Parking Lot 3

Area 10, also designated as Parking Lot 3, is located along the western side of Diablo Canyon/Shore Cliff Road opposite Parking Lot 7. To the West it drops off through undisturbed chaparral covered cliffs to the ocean and it overlooks Intake Cove to the north. The surface of the area is a combination of asphalt paving and concrete pads. The Fire Water Storage Tank and the Sewage Treatment Plant are located in the southeastern portion of the area. The area contains several structures that are used for office space, equipment storage, and shops. Two buildings in Area 10 have history involving radioactive material: The Hazardous Waste Facility (Building 120) and the Turbine Generator Equipment Warehouse (Building 111).

The Hazardous Waste Facility located on the eastern edge of the area is used to process only non-radioactive waste. However, the facility has a history of use as a staging area for shipments of radioactive materials in the southern half "storage area" of that building. The records reviewed during this HSA and information provided during personnel interviews did not reveal any instance of leakage or spread of radioactive material within the Hazardous Waste Facility. However, The HSA reviewers could not locate radioactive contamination surveys documenting the "as-left" condition after the temporary storage areas were removed.

The Turbine Generator Equipment Warehouse is located in the northwest portion of the area. The Hi-TRAC is stored there along with several large turbine related components. The northwest portion of the warehouse is caged off with cyclone fencing and posted as an RCA/RMA. That area is used for storage of several reactor coolant pump-related components, such as a pump impeller, rotating assembly, and motor. The components are contained (e.g., boxed or wrapped) and placed on the concrete pad. The area is subjected to periodic RP radiation and contamination surveys. RP surveys of the Turbine Generator Equipment Warehouse (e.g., RP Survey #55243 performed on 5/17/2017) show that no leakage or spread of radioactive contamination has occurred. However, the components stored there are radioactively contaminated. In addition, the open land areas of Area 10 are potentially impacted by effluent deposition, rainout, and/or site run-off.

Known and Potential Radiological Contaminants

Potential ROCs are long-lived radionuclides associated with Unit operations, low-level waste, and contaminated equipment (e.g., Co-60, Sr-90, Ni-63, and Cs-137), and also potential rainout from effluent releases (e.g., H-3 and C-14). This list of potential ROCs may be revised based upon more definitive characterization data.

Contaminated Media

Potentially contaminated media include:

- Asphalt
- Soil
- Concrete pads
- Building materials

Impacted/Non-Impacted Classification

The Hazardous Waste Facility and the Turbine Generator Equipment Warehouse are classified as impacted due to their history of containing radioactive materials. The exterior building surfaces and open land areas are potentially impacted by effluent deposition or rainout.

Preliminary MARSSIM Classification

A MARSSIM classification is not assigned to the Hazardous Waste Facility and the Turbine Generator Equipment Warehouse because the assumed future for these buildings is demolition and disposition as waste. The open land areas are classified preliminarily as MARSSIM Class 3 due to the potential impact of effluent deposition or site run-off.

Data Gaps

- "As-left" radiological conditions in the Hazardous Waste Facility
- Analytical data for concrete
- Analytical data for soil

5.3.2 Training and Maintenance Shop Buildings, Parking Lots 2/4a/4b/5

The Training Building (Building 109) and the Maintenance Shop Building/NPG Learning Center (Building 119) are located in Parking Lot 4a. There is no evidence of use or storage of radioactive materials in the Training Building. However, sealed radioactive calibration/check sources (Eu-152, Eu-154, Cs-137, Co-60, Ba-133, Sr/Y-90, H-3, C-14, and Th-230) were stored in the Dosimetry Office, Room 123, and in the Chemistry Laboratory, Room 239, in the Maintenance Shop Building/NPG Learning Center. Radiological survey records, such as RP Survey #47091 performed on 3/11/2016, confirm that the sources did not leak during storage.

Parking Lot 2 is located on the west side of Diablo Canyon Road/Shore Cliffs Road south of Area 10. The lot surface is gravel and it is used for parking road maintenance vehicles and other heavy equipment.

Parking Lots 4a and 4b, located along the western side of Diablo Canyon Road/Shore Cliffs Road, are asphalt covered. The roadway loops around the end of Lot 4a on its way down toward the Intake Area. Parking Lot 5, located on the west side of Marina Drive, is also a paved lot. The primary meteorological tower and associated buildings, Buildings 106 and 107, are located there. There is no evidence that radioactive materials were used, leaked, or spread in Parking Lots 4a, 4b, and 5.

Though not located in a predominant downwind sector for gaseous effluent, the building exterior surfaces and the Parking Lots may be subject to impact from effluent deposition or rainout events.

The WOCA also includes a narrow strip of asphalt covered open area located between the western perimeter of the Protected Area and the bluff overlooking Diablo Cove. A study of historical aerial photographs of that area shows that it was a frequent storage/staging area, including use for placement of equipment involved with the steam generation cleaning evolution.

Known and Potential Radiological Contaminants

For Room 123, the potential ROCs in storage locations are Eu-152, Eu-154, Cs-137, and Co-60. For Room 239, the potential ROCs in storage locations are Ba-133, Sr/Y-90, H-3, C-14, Th-230, Cs-137, and Co-60. Potential ROCs for the building's exterior surfaces are those associated with gaseous effluent, such as H-3, C-14, and Co-60.

Contaminated Media

Potentially contaminated media include:

- Concrete
- Asphalt
- Soil
- Building materials

Impacted/Non-Impacted Classification

Rooms 123 and 239 of the Maintenance Shop Building/NPG Learning Center are classified as impacted due to their history for containing radioactive material. The remainder of the building interior is classified as non-impacted. The exterior surfaces of both Buildings 109 and 119 are potentially impacted by effluent deposition or rainout.

Parking Lots 4a, 4b, 5, the exterior surfaces of the buildings associated with the meteorological tower, Buildings 106 and 107, and roadways are classified as impacted solely due to the potential effluent deposition or rainout. In addition to the potential for effluent rainout, the paved area between the PA and the bluff overlooking the DCA is classified as impacted due to its use during the Steam Generator Cleaning Project.

Preliminary MARSSIM Classification

A MARSSIM classification is not assigned to the Training Building and the Maintenance Shop Building/NPG Learning Center because the assumed future for these buildings is demolition and disposition as waste. The open land areas are classified preliminarily as MARSSIM Class 3 due to the potential impact of effluent deposition and the paved area between the PA and the bluff overlooking the DCA due to its involvement during the Steam Generator Cleaning Project.

Data Gaps

- Analytical data for concrete, asphalt, and soil

5.3.3 Intake Area

Marina Drive continues south and west past Parking Lot 5 down to the intake cove. At its terminus, it provides access to the East Breakwater. Breakwater Boulevard intersects Marina Drive and proceeds north, providing access to the intake structure and the West Breakwater. There is a significant amount of unpaved open land area.

Structures in the area include the Tenera Environmental Services (TES) Laboratory Facility (Building 123), the Intake Access (Building 108a), Intake Access & Security Office (Building 128), and the Intake Maintenance Shop (Building 129).

There are no records to indicate that any part of the Intake Area was involved in the use or spread of radioactive material. However, while not located in a predominant downwind sector for gaseous effluent, the building exterior surfaces, roadways, and the unpaved open land areas may be subject to impact from effluent deposition or rainout events.

Known and Potential Radiological Contaminants

Potential ROCs are long-lived radionuclides associated with rainout from effluent releases, such as H-3 and C-14.

Contaminated Media

Potentially contaminated media include:

- Concrete
- Soil
- Asphalt
- Building materials

Impacted/Non-Impacted Classification

The building exterior surfaces, roadways, and the unpaved open land areas within the Intake Area are classified as impacted solely due to the potential effluent deposition or rainout.

Preliminary MARSSIM Classification

A MARSSIM classification is not assigned to the buildings in the Intake Area because the assumed future for these buildings is demolition and disposition as waste. The open land areas are classified preliminarily as MARSSIM Class 3 due to the potential impact of effluent deposition.

Data Gaps

- Concrete sample analyses
- Asphalt and underlying soil sample analyses

5.3.4 Diablo Canyon Creek Area

The WOCA boundary extends around the northern end of the Protected Area to include the terminus of Diablo Canyon Creek. The creek runs along the northern boundary of the plant and empties into the Discharge Cove. Before entering the WOCA, the creek is routed underground entering conduit northeast of 500 kV Switchyard. The creek re-emerges from the conduit west of the 230 kV Switchyard opposite Raw Water Reservoir 1B. The creek receives stormwater runoff from both the NOCA and the Protected Area.

Document reviews and personnel interviews revealed several incidents that resulted in potential deposition of radioactive material of paved surfaces within the Protected Area. Such as the inadvertent release from the Primary Water Storage Tank and overflow of the solidification Pad Sump. Further, Action Request A0658602 documents a finding of Sr-90 in a REMP sample obtained from Diablo Creek.

Known and Potential Radiological Contaminants

Potential ROCs are long-lived radionuclides associated with Unit operations, and potential rainout from effluent releases, such as H-3, C-14, Sr-90, Ni-63, Co-60, and Cs-137.

Contaminated Media

Potentially contaminated media include:

- Sediment/soil

Impacted/Non-Impacted Classification

Diablo Canyon Creek is classified as impacted due to the potential deposition of radioactive material contained in stormwater runoff from both sources in the NOCA and the Protected Area.

Preliminary MARSSIM Classification

The portion of Diablo Canyon Creek running through the WOCA is classified preliminarily as MARSSIM Class 3.

Data Gaps

- Sediment from the bed of Diablo Canyon Creek
- Soil adjacent to Diablo Canyon Creek

5.4 DISCHARGE COVE AREA

Description and Historical Use

The Discharge Cove Area (DCA) is the body of water immediately west of the power block area outside the protected area fence, encompassing approximately 115,000 m^2. The DCA opens to the Pacific Ocean to the west. It serves as the receiving waters for the circulating water system via the Units 1 and 2 Discharge Structure. The DCA is completely submerged at all times and is bounded by the mean high tide line. The cove's floor is covered with sand, gravel, and rocks. There is also an area immediately west of the discharge structure that is covered by and approximately 2-foot-thick bed of broken shells. Figure 5.4-1 shows the general orientation of area DCA.

Figure 5.4-1. Structures and Areas within the DCA

5.4.1 Units 1 and 2 Discharge Structure and Diablo Cove

The Discharge Structure is the discharge point for the Units 1 and 2 main circulating water systems to the DCA. In addition to providing plant cooling, the main circulating water system provides dilution flow and a discharge path for monitored releases from the facilities liquid radioactive effluent. All liquid effluent entering the DCA via the Discharge Structure has complied with NRC effluent limits as demonstrated by liquid effluent accountings in Annual Radioactive Effluent Release Reports. However, the settling properties of radioactive material and potential concentration mechanisms for radioactive material once radioactive materials enter the DCA are not known.

Known and Potential Radiological Contaminants

Potential ROCs for DCA and the discharge structure include radionuclides associated with liquid waste as identified in Annual Radioactive Effluent Release Report; these potential ROCs include gamma emitters (e.g., Co-60, Sb-125, Cs-134, and Cs-137) and HTD radionuclides (e.g., H-3, C-14, and Sr-90).

Contaminated Media

Potentially contaminated media include:

- Sand
- Sediment
- Concrete

Impacted/Non-Impacted Classification

The DAC is an impacted area based on receiving radioactive liquid effluent during operating years. In addition, the Discharge Structure is classified as an impacted structure.

Preliminary MARSSIM Classification

The DCA is preliminarily classified as a MARSSIM Class 3 area.

Data Gaps

- Radiation surveys of the Discharge structure
- Shoreline soil sample analyses

5.5 NORTH PROTECTED AREA

Description and Historical Use

The North Protected Area (NPA) is the outside area that surrounds the Power Block Area. It encompasses approximately 66,500 m^2. The Protected Area (PA) fence forms the west, north, and east boundaries; the south boundary runs parallel to the south face of the administration building in the east-west direction, but goes around the north side of the administration building.

Elevations of the NPA start at the 85-foot elevation on the west side and climb to the 115-foot elevation just west of the PBA. A slope on the east boundary rises an additional 10 feet or more and terminates at the eastern boundary. Most of the area is paved with asphalt and some concrete. Gravel is used in areas around transformers. The sloped areas are covered with crushed stone (riprap).

The NPA contains the Make-Up Water tanks, Fire Water tank, Radwaste buildings, Solidification Pad, Transformers, Service Air Compressors, several smaller shops, a warehouse, and office space for plant support activities. Laydown, staging, and temporary storage areas have been routinely established in the NPA to support plant outage activities.

Figure 5.5-1shows the general orientation of NPA as well as major plant structures included in the area.

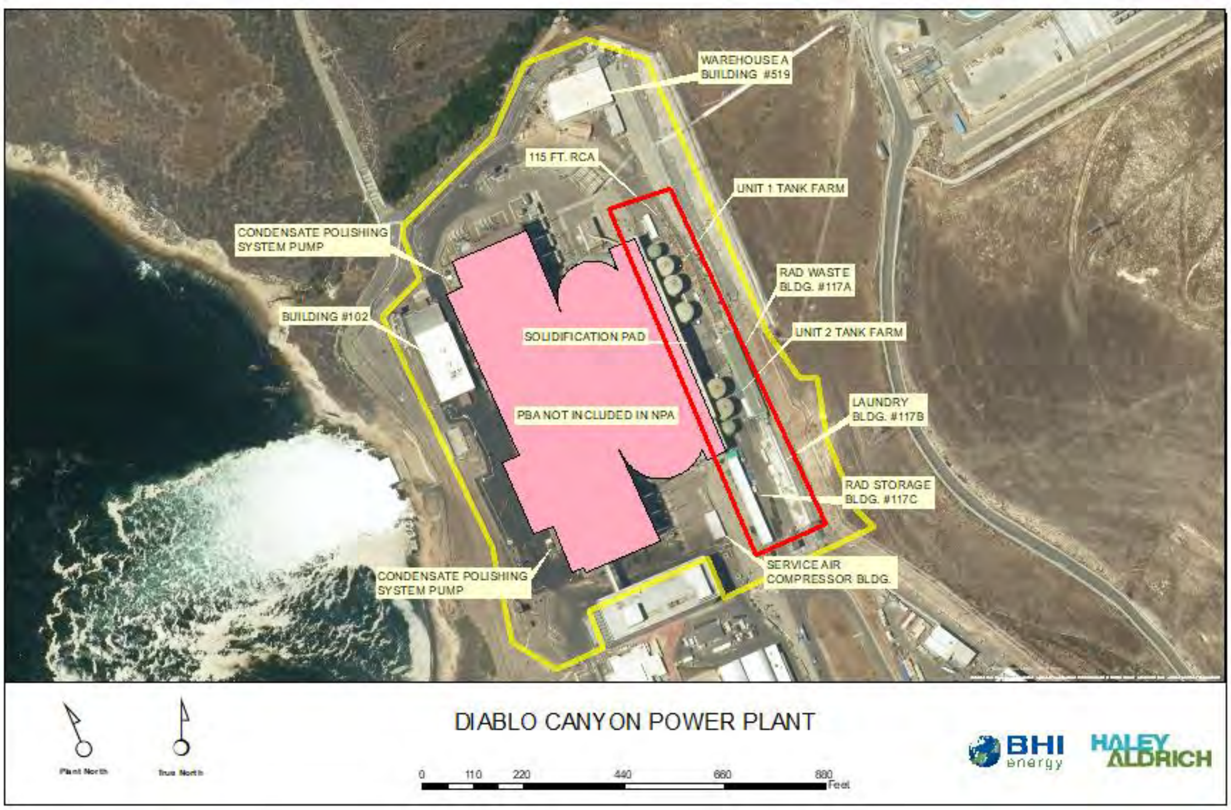

Figure 5.5-1. Structures and Areas within the NPA

5.5.1 Warehouse A and Adjacent Buildings

Warehouse A (Building 519) is situated in the Northeast section of the NPA. This building has housed a RCA for several years. It is currently used to store steam generator equipment including Nozzle Dams. Review of radiation surveys for the RMA established within Warehouse A revealed measurable dose rates from stored equipment and the presence of removable radioactive contamination on the floor within the RMA. Isotopic analysis was not performed on the samples collected from the stored equipment.

In addition to Warehouse A, there are several other buildings in this area that were used as office buildings, conference rooms and craft facilities. These facilities were used as outage support facilities in the past. They currently see minimal use.

Other structures in this area include buildings 518 (Craft Facility), 520 (Paint Department), 521, (CSRP outage office) 527 (Start-Up), and 528 (Toilet Trailer). These buildings have air conditioners that discharged condensate directly to the ground around the facility. Experience at other nuclear power plant sites has shown that condensate from air conditioning (A/C) units can have high concentrations of tritium. The areas around these buildings receiving A/C condensate drainage have not been sampled for potential tritium contamination.

Known and Potential Radiological Contaminants

Potential ROCs for Warehouse A and adjacent buildings include radionuclides associated with solid waste as identified in annual effluent reports, such as gamma emitters (e.g., Co-60, Cs-134, and Cs-137) and HTD radionuclides (e.g., H-3, Fe-55, Ni-63, Sr-90, and Tc-99). This list of potential ROCs may be revised based upon more definitive scoping and characterization data.

Contaminated Media

Potentially contaminated media include:

- Gravel/crushed stone
- Underlying soil
- Concrete

Impacted/Non-Impacted Classification

The Warehouse A and adjacent buildings are impacted structures based on historical activities, current and past storage of radioactive materials, and the discharge of A/C condensate to the ground with potentially elevated concentrations of tritium.

Preliminary MARSSIM Classification

A MARSSIM classification is not assigned to Warehouse A and the adjacent buildings because of planned demolition and disposal as waste. Adjacent land areas are classified as Class 1 areas due to use and storage of radioactive materials within the PA.

Data Gaps

- Analytical results for soil

- Analytical results for asphalt
- Analytical results for A/C condensate

5.5.2 115-Foot Elevation Radiological Control Area

The 115-foot RCA is the outdoor area located east of and adjacent to the Power Block. The area is covered with asphalt pavement and some concrete in selected areas. The asphalt is in poor condition in some locations, particularly at the south end of the RCA. Steel plates have been placed on the roadway at the south end to help support heavy loads.

During the plant operating years, the 115-foot RCA was used extensively for the processing, packaging and storage of Solid Radioactive Waste. Corrective Action Program Records reviewed by the HSA team identified several contamination events in the area. A few radiological surveys identified Co-60, Cs-137 and C-14 as predominant isotopes.

The steam generator travel path exiting the south end of the 115-foot RCA was reworked to accommodate heavy loads. Based on interviews conducted by the HSA team, asphalt was removed from the back yard and transported offsite as radioactive waste. Soils underlying the asphalt were also excavated for placement of concrete pads and the steam generator travel path exiting the south end of the RCA. RP personnel collected soil samples, which were analyzed by gamma spectroscopy to effluent LLDs to guide excavation and disposal decisions. Excavated soil showing positive identification of plant-related radioactivity was packaged and sent to radwaste for disposal. Excavated soil showing no positive plant-related radioactivity was relocated to other site areas.

Buried Drain Lines:

Buried portions of the liquid radwaste drain line are located within the 115-foot RCA. These lines include the Laundry Wet Washer Drain, the Solidification Pad Discharge (Wash-down Drain), the Radwaste Storage Building, and the Radwaste (Packaging and Processing) Facility drain. Records documenting the radiological status of these drain lines were not found during this HSA. In 2007, approximately 50% of the length of the Solidification Pad Discharge (Washdown Drain) line was excavated and visually inspected; no evidence of leakage was identified.

Yard Drains:

The 115-foot RCA contains a yard drain system that captures rain runoff from the south half of the area. Rain water is directed into a cistern that discharges onto the riprap-covered slope west of the Rad Storage Building (117C). The discharge flows down the slope and into a storm drain by the service air compressor building. This runoff is discussed in Section 5.5.3.

Rainwater from the northern half of 115-foot RCA flows out of the RCA and into storm drain number 9, a passive oily water separator, and then to the Diablo Canyon Creek. This runoff is also discussed in Section 5.5.3.

Solidification Pad:

The Solidification Pad abuts the east wall of the Auxiliary Building. The solidification pad was used for dewatering spent resin and other radioactive waste processing activities. Corrective action documentation reviewed by the HSA team identified several contamination events involving spills of radioactive materials on and around the pad. Radiological surveys associated with these events identified contamination levels and dose rates, but did not include isotopic analyses.

Units 1 & 2 Tank Farms

The Units 1 & 2 Tank Farms include the Primary Water Tanks, Condensate Storage Tanks, Water Storage Tanks, and a common fire water storage tank.

A contamination event involving the Unit 1 Primary Water Storage Tank occurred in 1993. About 2500 gallons of water was drained from the tank to a floor drain in the Auxiliary Building ventilation area, which drained directly to the pavement on the north side of the building by the Unit 1 auxiliary boiler. Radionuclides identified from this event included: Co-60, Cs-137, H-3, and C-14. This event is discussed in Section 5.5.3.

Radwaste Buildings:

The Radwaste Building (Building 117A), Laundry Building (Building 117B), and RAM Storage Building (Building 117C) are located in the south half of the 115-foot RCA. The HSA team reviewed several routine and job coverage radiation and contamination surveys for these buildings. The surveys reviewed depicted expected radiological conditions, including locations of Radiation Areas, High Radiation Areas, and Contamination Areas. The HSA team reviewed the corrective action database and found no events related to these buildings.

The Radwaste Building (the lower level of Buildings 117A and 117B) is used for preparing, packaging, and storage of radioactive waste. Most of the vaults in this building are posted as Radiation Areas. One area is posted as a Contaminated Area and one vault is posted as a Locked High Radiation Area. Processes within this building include filter chopping and sorting/packaging of radioactive waste.

The Laundry Building is the upper level of the Radwaste Building. It contains the protective clothing washers and dryers. The area also includes facilities for the decontamination of tools and equipment. Portions of this building are posted as Contamination Areas and Radiation Areas. There are 7 floor drains in the Laundry building that have not been surveyed.

The RAM Storage Building is used for the storage of contaminated tools and equipment for use in the RCA. Different bays in the building are designated for use by different work groups. Several of the bays are posted as Radiation Areas.

Known and Potential Radiological Contaminants

Potential ROCs for the 115-foot RCA and associated buildings and structures include radionuclides associated with solid waste as identified in annual effluent release reports, such as gamma emitters (e.g., Co-60, Cs-134, and Cs-137) and HTD radionuclides (e.g., H-3, Fe-55, Ni-63, Sr-90, and Tc-99). This list of potential ROCs may be revised based upon more definitive scoping and characterization data.

Contaminated Media

Potentially contaminated media include:

- Gravel/crushed stone
- Underlying soil

- Building materials
- Drain sediment
- Concrete

Impacted/Non-Impacted Classification

The 115-foot RCA is an impacted area based on current and historical activities and storage of radioactive materials both currently and during operating years.

Preliminary MARSSIM Classification

A MARSSIM classification is not assigned to Structures and Equipment in this area. However, the open areas are preliminarily identified as MARSSIM Class 1 areas.

Data Gaps

- Radiological surveys of the yard drain system
- Radiological surveys of the floor drains in the laundry building and rad waste buildings
- Soil samples

5.5.3 North and South Pavement Areas

NORTH: The area in the north section of the NPA includes the Unit 1 Main and Start up Transformers, the auxiliary boiler, and a roadway from the north end of the 115-foot RCA that travels along the north boundary of the NPA. There is also a riprap-covered slope located between the upper section of the road from the 115-foot RCA and the 85-foot elevation where the auxiliary boiler and transformers are located.

The area around the auxiliary boiler was contaminated with water from the Primary Water Storage Tank in 1993. About 2500 gallons of water from the tank drained directly to the pavement on the north side of the building by the Unit 1 auxiliary boiler. Radionuclides identified included Co-60, Cs-137, H-3, and C-14. Documents reviewed during this HSA (Action Request A0320718 and radiological surveys) indicate that the contaminated water remained in the area on the 85-foot elevation north of the Auxiliary Building and evaporated. The area was subsequently covered with asphalt.

On 5/15/12, water from the heel portion of the Condensate Storage Tank (CST) drained onto the ground within the RCA during floor debris removal. The CST water eventually reached Diablo Canyon Creek via NPDES Discharge Path 009 (Yard Storm Drain). Water that did not go into the storm drain accumulated in low spots and evaporated.

SOUTH: The paved area in the south section of the NPA includes the Unit 2 Main and Startup Transformers and the Service Air Compressors and extends along the north side of the Administration Building and the Power Block. The area is used routinely as an outage laydown area.

The south paved area includes a riprap-covered slope, located between the north half of the 115-foot RCA and the service air compressors and transformers on the 85-foot elevation. Stormwater runoff from the 115-foot RCA and the roof of the Radioactive Materials Storage Building percolates through the riprap-covered slope and reaches the pavement below. This runoff, which eventually flows into a yard drain located on the west side of the Service Air Compressor Building, potentially contains low levels of radioactive material from the 115-foot RCA and gaseous effluents.

Condensate from the Administration Building A/C system discharges to the pavement on the north side of the building, raising the potential for localized contamination due to the capture of tritium and C-14 from gaseous effluents. The HSA team did not find radiological survey data for the slope and riprap or the paved area north of the Administration building.

Storm drains are assumed sampled per procedure ENV.SW1; however, storm drain sample results were not found during this HSA effort.

Known and Potential Radiological Contaminants

Potential ROCs for paved areas within the NPA and storm drain structures include radionuclides associated with solid waste as identified in annual effluent release reports, such as gamma emitters (e.g., Co-60, Cs-134, and Cs-137) and HTD radionuclides (e.g., H-3, C-14, Fe-55, Ni-63, Sr-90, and Tc-99). This list of potential ROCs may be revised based upon more definitive scoping and characterization data.

Contaminated Media

Potentially contaminated media include:

- Gravel/crushed stone/riprap
- Asphalt
- Underlying soil
- Storm drain surveys
- Concrete

Impacted/Non-Impacted Classification

The paved areas in the NPA are impacted areas based on historical activities, documented radioactive contamination events, and storage of radioactive materials.

Preliminary MARSSIM Classification

The soil underlying the asphalt and concrete areas in the NPA is preliminarily classified as MARSSIM Class 1.

Data Gaps

- Radiation survey data
- Asphalt analyses
- Concrete analyses
- Radiation surveys in the open areas within the NPA
- Surface and subsurface soil sample analyses

5.5.4 Unit 1 and 2 Condensate Polishing System Sumps

The Unit 1 and 2 Condensate Polishing Systems sumps are located adjacent to and immediately west of the Turbine building. The function of the condensate polishers is to remove contaminants from the condensate. Salt Water and other mineral contaminants are introduced into the condensate system from ocean water leaking into the condensers. The condensate polishing system ensures that the quality of the water used to feed the steam generators meets specifications.

Before replacing steam generators in 2008 and 2009, steam generator leakage introduced radioactive materials from the Reactor Coolant System into the steam generators (NRC IN 2003-13). Steam carried a small percentage of the non-volatile isotopes to the condensate and feedwater systems. These isotopes were removed by and concentrated in the Condensate Polishing Demineralizers. When the condensate polishers are regenerated (cleaned), they are rinsed to the sumps. Radiation surveys documenting the radiological status of the sumps were not found during this HSA.

Known and Potential Radiological Contaminants

Potential ROCs for the Condensate Polishing System sumps include longer lived radionuclides associated with reactor coolant, such as gamma emitters (e.g., Co-60, Cs-134, and Cs-137) and HTD radionuclides (e.g., H-3, C-14, Fe-55, Ni-63, Sr-90, and Tc-99). This list of potential ROCs may be revised based upon more definitive characterization data.

Contaminated Media

Potentially contaminated media include:

- Concrete

Impacted/Non-Impacted Classification

Condensate Polishing System sumps are impacted structures based due to historical steam generator tube leakage prior to the replacement of the steam generators in 2008 and 2009.

Preliminary MARSSIM Classification

A MARSSIM Classification is not assigned to the sump because it is to be removed from site.

Data Gaps

- Contamination surveys of the sump structure
- Analyses of the sump concrete
- Analyses of sump sludge.

5.5.5 Monitoring Wells

Groundwater data and records reviewed during this HSA document the presence of tritium in samples collected from DCPP groundwater monitoring wells. As of 2012, on-site groundwater samples are collected at seven monitoring wells: OW1, OW2, DY1, 8S3, WW2, GW1, and GW2.

Tritium has been detected in the French Drain wells, OW1, OW2, and DY1, since 2006. Historically, tritium concentrations have been as high as 64,800 pCi per liter. However, the presence of tritium in these three wells has been attributed to the recapture of tritium released in gaseous effluent through deposition and washout mechanisms, not to leakage of plant systems. Information obtained during an interview revealed that the wells to the French drain are pumped down occasionally to the Auxiliary Building radwaste system when the water level gets high. Tritium levels in groundwater samples from wells 8S3, WW2, GW1, and GW2 have been significantly lower (e.g., 400 pCi per liter or lower). Nevertheless, the groundwater data indicate radioactive material in site groundwater.

Known and Potential Radiological Contaminants

Potential ROCs for the Monitoring wells is H-3

Contaminated Media

Potentially contaminated media include:

- Soil

Impacted/Non-Impacted Classification

Use of radioactive material has impacted site groundwater.

Preliminary MARSSIM Classification

Not assigned.

Data Gaps

None.

5.5.6 West Paved Area and Building 102

The portion of the NPA west of the Turbine Building includes approximately 74,000 ft^2 of asphalt pavement, the I&C Telecommunications and Medical Facility (Building 102), and temporary office structures, which are office cargo containers that can be moved as required.

The west portion of the paved area has often been used to stage materials and equipment to support plant outages. The HSA team reviewed documents and photographs that showed the area was used for the steam generator cleaning operations in 2004. A review of historical records did not identify any radiological events resulting in contamination in the area.

Building 102 is a 2-story structure that includes office space, meeting rooms, and workstations for I&C and Telecommunications personnel. The south end of the building houses the site medical facility. There is storage for tools and equipment at the north end of the building and some enclosed workstations. A review of historical records did not identify any radiological events or radiological contamination in building 102. The proximity of the building to the power block exposes it to potential rainout and deposition of effluent releases.

The temporary office structures house various contract companies that provide outage and project support. Records reviewed by the HSA team did not identify any radiological events or radiological contamination in these buildings. As noted above, these buildings are exposed it to potential rainout and deposition of effluent releases.

Known and Potential Radiological Contaminants

Potential ROCs are those associated with gaseous effluent, such as H-3, C-14, and Co-60 and plant operations.

Contaminated Media

Potentially contaminated media include:

- Building Materials
- Asphalt and concrete pavement

Impacted/Non-Impacted Classification

The buildings and pavement are classified as impacted due to the potential effluent deposition or rainout and its proximity to the operating units.

Preliminary MARSSIM Classification

A MARSSIM classification is not assigned to buildings because of planned demolition and disposal as waste. Adjacent land areas are classified as MARSSIM Class 1 areas due to use and storage of radioactive materials within the NPA.

Data Gaps

- Radiological surveys of pavement
- Analytical data for surface and subsurface soils

5.6 SOUTH PROTECTED AREA

Description and Historical Use

The South Protected Area (SPA) at Diablo Canyon Power Plant encompasses an area of 53,400 m^2. It forms the southern portion of the DCPP Protected Area (PA), and contains Administration Building, DCPP Main Warehouse, Cold Machine Shop (CMS), New Security Building, Old Security Building, Liquid Storage Building, and miscellaneous temporary office trailers.

There have been events where lapses in radioactive material control allow radioactive material from the RCA to enter the SPA.

All buildings in the SPA 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.

The SPA is bounded to the north by the North Protected Area and to the east, west, and south by the South Owner Controlled Area.

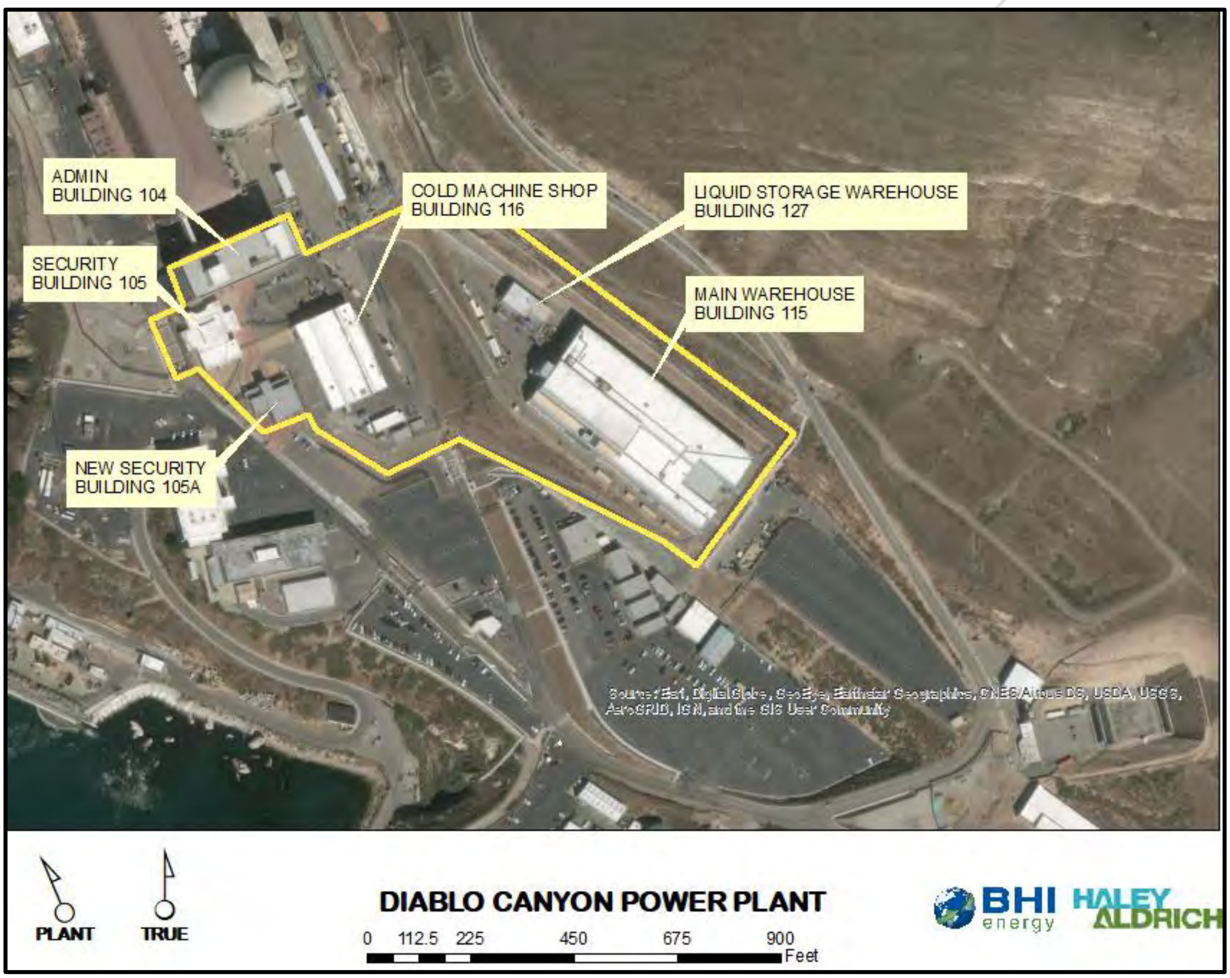

Figure 5.6-1. Structures and Areas within the SPA

5.6.1 Administration, Security, Liquid Storage, and Temporary Office Buildings

The Administration Building is a 7-story structure. It houses the plant cafeteria, auditorium, and fitness center on the first floor. Administrative offices and conference rooms are located on the second through sixth floors. Building services, elevator rooms, and domestic storage rooms are located on the seventh floor. Before remodeling in 2015, Room 218 was used as the dosimetry office and was posted as an RMA because it contained radioactive sources for calibrating whole body counters.

There are two security structures inside the SPA, security administrative building, and access/egress portal. The only radioactive material used in the access/egress portal is the Ni-63 sources used by security explosive detectors. These sources are surveyed by RP on a routine basis. The egress portion also contains portal monitors, which radiation protection personnel would respond to case of alarm.

The Liquid Storage Building is used for storage and transfer of non-radioactive hazardous products.

Temporary office structures, which are office cargo containers that can be moved as required, house various contract companies during outages and projects.

The exterior surfaces of the all buildings within the SPA are subject to impact from effluent deposition and rainout given the close proximity to the effluent release points.

Known and Potential Radiological Contaminants

Potential ROCs for the Administration building, Liquid Storage Building, Security buildings, and temporary office buildings include radionuclides associated with gaseous effluent (H-3, C-14, and Co-60). This list of potential ROCs may be revised based upon more definitive scoping and characterization data.

Contaminated Media

Potentially contaminated media include:

- Gravel/crushed stone
- Underlying soil
- Asphalt
- Concrete

Impacted/Non-Impacted Classification

Administration, Security, Liquid Storage, and Temporary Office Buildings are impacted buildings based on historical activities, use and storage of radioactive materials within the PA, and the potential for effluent deposition and rainout.

Preliminary MARSSIM Classification

The buildings are expected to be removed, but the footprint for the buildings and the area surrounding them is preliminarily classified as MARSSIM Class1.

Data Gaps

- Radiation survey data
- Asphalt samples
- Concrete samples
- Soil sample analyses

5.6.2 DCPP Main Warehouse

The DCPP Main Warehouse is the primary distributor of goods and materials for site operations. The warehouse is the usual receiver of small radioactive packages at the site. An area (Section J) is set aside for storing the packages once received. Radiation protection personnel routinely survey Section J. The surveys have not identified any loose or fixed surface contamination. The DCPP warehouse is in a predominant downwind sector from the plant effluent discharge points and is subject to potential contamination via deposition or rainout of radioactive materials in gaseous effluent releases.

Known and Potential Radiological Contaminants

Potential ROCs for DCPP Main Warehouse include radionuclides associated with plant stack releases in annual effluent reports radionuclides (e.g., H-3, C-14 and Co-60). This list of potential ROCs may be revised based upon more definitive scoping and characterization data.

Contaminated Media

Potentially contaminated media include:

- Gravel/crushed stone
- Underlying soil
- Concrete

Impacted/Non-Impacted Classification

DCPP Main Warehouse is an impacted structure based on historical activities and storage of radioactive materials during operating years and the low potential for contamination on exterior surfaces via effluent washout and deposition.

Preliminary MARSSIM Classification

The building is expected to be removed but the footprint for the buildings and the area surrounding them is preliminarily classified as MARSSIM Class 1.

Data Gaps

- Radiation survey data
- Concrete samples
- Soil sample analyses

5.6.3 Cold Machine Shop

The Cold Machine Shop is used primarily for repair and maintenance of mechanical components onsite. It also contains maintenance offices. The Cold Machine Shop is primarily used for non-radioactive components; however, there have been times when components that have activated metals, fixed contamination, and/or minimal loose surface contamination (250 dpm/100cm^2) have been repaired in the facility.

Known and Potential Radiological Contaminants

Potential ROCs for Cold Machine Shop include radionuclides associated with solid waste as identified in annual effluent reports, such as gamma emitters (e.g., Co-60, Cs-134, and Cs-137) and HTD radionuclides (e.g., H-3, Fe-55, Ni-63, Sr-90, and Tc-99). This list of potential ROCs may be revised based upon more definitive characterization data.

Contaminated Media

Potentially contaminated media include:

- Underlying soil
- Concrete

Impacted/Non-Impacted Classification

Cold Machine Shop is an impacted area based on historical activities and storage of radioactive materials during operating years.

Preliminary MARSSIM Classification

The buildings are expected to be removed but the footprint for the buildings and the area surrounding them is preliminarily classified as MARSSIM Class 1.

Data Gaps

- Radiation survey data
- Concrete samples
- Soil sample analyses

5.6.4 Open Land Area

The open land area in the SPA consists of concrete around the security buildings and Administration Building. Asphalt around the Cold Machine Shop and DCPP Main Warehouse. A grassy hillside is located between the warehouse and the Cold Machine Shop. A road coming from 115-ft elevation of the plant slopes to the 85ft elevation just east of the Cold Machine Shop. This road is a portion of the heavy haul route. There are two storm drains at the base of which receive runoff coming from the east 115-ft yard RCA.

History shows that RAM in strong tight containers has previously been stored near the Cold Machine Shop and warehouse to support outage work.

The entire SPA is located close to and in a predominant downwind sector from Unit 1 and Unit 2 effluent release points, raising the potential for contamination via deposition and rainout of radioactive materials (i.e., H-3, C-14, and Co-60) in gaseous effluent. In addition, condensate from buildings air conditioning units drains to the ground, increasing the potential impact from H-3 and C-14.

A portion of the heavy haul route used to transport radioactive material to and from the RCA, including fuel casks to the ISFSI pad and the old steam generators and old reactor heads to the Old Steam Generator Storage Facility, runs through the SPA. Based on information obtained during personnel interviews, RP personnel escorted and monitored movement of radioactive materials, such as the old reactor heads, along the heavy haul route. While there is no evidence of any leakage of radioactive material along the travel path within the SPA, Radiation and Contamination Survey #12816, performed 10/26/2010, showed leakage from the Unit 1 Old Reactor Vessel Closure Head after being staged in the NOCA. Records documenting surveys for the portion of the heavy haul route within the SPA following discovery of the leak at the OSGSF are not available.

Known and Potential Radiological Contaminants

Potential ROCs for Open Land Area include radionuclides associated with solid waste as identified in annual effluent reports, such as gamma emitters (e.g., Co-60, Cs-134, and Cs-137) and HTD radionuclides (e.g., H-3, Fe-55, Ni-63, Sr-90, and Tc-99). This list of potential ROCs may be revised based upon more definitive scoping and characterization data.

Contaminated Media

Potentially contaminated media include:

- Gravel/crushed stone
- Underlying soil
- Concrete
- Asphalt
- Sediments in storm drains

Impacted/Non-Impacted Classification

The Open Land Area is an impacted area based on historical activities and storage of radioactive materials during operating years.

Preliminary MARSSIM Classification

The Open Land Area within the SPA is classified preliminarily as MARSSIM Class 1.

Data Gaps

- Radiation survey data
- Soil sample analyses
- Sediment samples
- Asphalt samples
- Storm drain inspections and surveys

5.7 POWER BLOCK AREA

Description and Historical Use

Diablo Canyon is a dual unit, nearly identical 4-loop Westinghouse pressurized water reactor (PWR). Each unit generates about 1100 mega-watts electric. Unit 1 began operations in 1985, Unit 2 began in 1986. Both units are scheduled to shut down after their initial 40-year operating licenses expire.

The Power Block Area footprint, which is about 22,000 m^2, contains the systems, structures, and components of the Diablo Canyon Generating Station including:

1. Containment buildings that houses the nuclear steam supply system
2. Fuel handling buildings that handle new and used nuclear fuel bundles
3. Auxiliary Building that houses reactor coolant clean-up systems, liquid and gaseous radwaste systems, and the control room
4. Turbine building that houses the turbine-generators, the full-flow polishing demineralizer system, and the diesel generators.

Figure 5.7-1 shows the general orientation of the PBA.

Figure 5.7-1. Structures and Areas within the PBA

5.7.1 Unit 1 & Unit 2 Containment Buildings

The two containment buildings are steel-lined, reinforced concrete, cylindrical structures with a flat reinforced concrete base slab and a hemispherical dome. One of the building's functions is to prevent significant uncontrolled release of radioactive materials to the environment from normal operations and postulated accidents.

Each containment building includes the following major systems, structures, and components:

- Reactor Vessel and associated Reactor Coolant System Piping
- Steam Generators (4)
- Pressurizer
- Reactor Coolant Pumps (4)
- Reactor Cavity and Reactor Cavity Sump
- Refueling Machine and Fuel Transfer System Up-Ender
- Regenerative Heat Exchangers
- Containment Recirculation Sump
- Plant Ventilation Exhaust

Radiological Discussion

Plant 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. The primary radionuclide of concern is tritium. Information regarding the extent of the tritium contamination on the exterior concrete surface of the containment building was not found during this HSA.

Information obtained during interviews with the RP staff 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 PBA may have similar concentrations of tritium due to deposition from gaseous effluent.

In 2009, the NRC reported that because liquid and gaseous effluents had decline steadily over the life-span from the current fleet of nuclear power plants, decreasing to the point that C-14 is now considered a principle radionuclide in gaseous effluents. Comparing measurements of C-14 to predictions based on Electrical Power Research Institute (EPRI) models, Diablo Canyon appears in-line with other PWRs, discharging about ten curies per year.

According to the 2016 Annual Radioactive Effluent Release Report, about 74 curies of tritium and 24 curies of carbon-14 were released as gaseous effluents. Although carbon-14 is not expected to washout or deposit on building surfaces as much as tritium, the absence of C-14 analysis in rain water was identified as a gap in data.

The primary shield wall is a large reinforced concrete structure that supports and surrounds the reactor vessel. High neutron flux causes activation of the concrete producing several isotopes of europium. Activation of the steel rebar within the concrete produces cobalt-60. The primary shield wall is not amenable to characterization until after the reactor vessel is removed

The secondary shield wall within containment is largely shielded from neutron radiation and is therefore unlikely to be activated. Interviews with the RP staff did not identify any bare concrete walls inside the containment building that had been significantly contaminated from reactor coolant leaks.

Each containment building is equipped with a transfer tube that communicates with the fuel handling building. Moving spent nuclear fuel bundles inside the transfer tube creates a high potential for fission product contamination. Information obtained during personnel interviews revealed that there were several occasions when miss-alignments of transfer flange covers have allowed air to pass from the containment buildings through the transfer tubes and into their respective fuel handling buildings. The impact on the fuel handling buildings is discussed in the Section 5.7.2.

Based on records reviewed during this HSA, fuel cladding integrity has been excellent in both units since start-up. Information obtained during personnel interviews and from the DCPP Annual Radioactive Effluent Release Reports indicates that improvement of the radioactive coolant clean-up systems has contributed to reduction of radioactivity in the reactor coolant system piping and components.

The radiological constituents of the residue (crud) layer within the reactor coolant system piping and components are not amenable to characterization until reactor system component disassembly.

Each containment building has several sumps. The reactor cavity sump is located underneath the reactor vessel at the bottom of the containment building on the 60-ft elevation. Reactor cavity seal leaks have contributed to the contamination of these sumps.

The containment building sump is located on the 91-ft elevation and drains to the liquid radwaste system in the auxiliary building. The containment recirculation sump is designed for use in the event of a loss of coolant accident. Records reviewed during this HSA did not reveal any operational event that would cause these sumps to be a significant radiological concern. However, records and surveys documenting the current radiological status (i.e., dose rates, surface contamination, or volumetric contamination) of the sumps or sediments therein were not found during this HSA.

Known and Potential Radiological Contaminants

Potential ROCs on the radiologically significant structures and components would be similar to those found in the reactor coolant system resin and filters: H-3, C-14, Cr-51, Fe-55, Mn-54, Co-57, Co-58, Co-60, Ni-59, Ni-63, Zn-65, Sr-89, and Sr-90.

Potential ROCs for surface contamination on low-to-moderately contaminated fuel handling building structures and components would be similar to DAW: Fe-55, Mn-54, Co-57, Co-58, Co-60, Ni-59, Ni-63, and Zn-65.

These lists of potential ROCs may be revised based on more definitive data collected during site characterization.

Contaminated Media

Potentially contaminated media include:

- Concrete
- Structural steel
- Systems/system piping

- Sediment/sludge
- Cabling and gaskets

Impacted/Non-Impacted Classification

Unit 1 and 2 Containment Buildings are identified as impacted structures based on historical activities and use of radioactive materials during operating years.

Preliminary MARSSIM Classification

The Containment Building structures and systems are not assigned a MARSSIM classification.

Data Gaps

- Radiological analyses defined the crud layer within the reactor coolant system piping and components
- Radiological analyses to determine extent of volumetric contamination for concrete
- Radiological surveys and sample analyses for containment sumps
- Tritium and carbon-14 on exterior building surfaces

5.7.2 Unit 1 & Unit 2 Fuel Handling Buildings

The Fuel Handling Buildings contains systems, structures, and components that allow for handling and transporting nuclear fuel bundles. The top of the spent fuel pools are at the 140-ft elevation. New fuel is inspected, stored, and transferred to the reactor cavity. Used fuel is moved from the reactor, through the transfer canal, and temporarily stored in spent fuel pool racks.

The Fuel Handling Building includes the following major components:

- New Fuel Storage Racks
- Spent Fuel Pool
- Spent Fuel Pool Cooling and Cleanup System
- Cask Wash-down Area
- Fuel Transfer Canal
- Transfer Tube
- Transfer Cart and Up-Ender

Radiological Discussion

The radiologically significant structures and components within the Fuel Handling Buildings include the spent fuel pool, fuel racks, fuel transfer canal, and associated fuel transfer components. Each has the potential for fuel debris because of their contact with spent fuel bundles. Moving spent nuclear fuel bundles creates the potential for high levels of fission product radioactivity, fuel fragment hot particles, and high alpha-to-beta contamination ratios.

Radiological contamination survey records reviewed during this HSA show high alpha-to-beta contamination ratios on equipment and in areas associated with transferring spent nuclear fuel. For example, contamination surveys in support of maintenance on the Unit 2 Spent Fuel Pool fuel elevated found alpha contamination over 200 dpm/100 cm^2. The beta-to-alpha ratio of 35 established the area as requiring a high level of radiological controls. Radiation and contamination surveys show that the remainder of the fuel handling building contains equipment with low-to-moderate radiological concern.

According to interview with the RP staff, tritium concentrations in the spent fuel pool were historically high due to the use of the boron recovery system and the reuse of reactor coolant. Water evaporating from the spent fuel pool is a constant source of gaseous tritium exhausted through the plant vent stack.

On several occasions, air has been allowed to pass rapidly from the containment buildings through the transfer tubes and into the fuel handling buildings causing significant contamination inside the fuel handling buildings. Records show that decontamination was performed. However, horizontal surfaces in the upper areas of the fuel handling building may still remain contaminated.

Known and Potential Radiological Contaminants

Potential ROCs on the radiologically significant structures and components would be similar to those found in the reactor coolant system resin and filters: H-3, C-14, Cr-51, Fe-55, Mn-54, Co-57, Co-58, Co-60, Ni-59, Ni-63, Zn-65, Sr-89, and Sr-90.

Potential ROCs for surface contamination on low-to-moderately contaminated fuel handling building structures and components would be similar to DAW: Fe-55, Mn-54, Co-57, Co-58, Co-60, Ni-59, Ni-63, and Zn-65.

The lists of ROCs may be revised based on more definitive data collected during site characterization.

Contaminated Media

Potentially contaminated media include:

- Concrete
- Structural steel

Impacted/Non-Impacted Classification

The Fuel Handling Buildings and associated systems and components are classified as radiologically impacted areas and structures based on historical activities and use of radioactive materials during operating years.

Preliminary MARSSIM Classification

The Fuel Handling Building and systems are not assigned MARSSIM classifications.

Data Gaps

- Tritium and carbon-14 on exterior building surfaces, especially horizontal surfaces.
- Radiation and contamination conditions on surfaces in the fuel handling building that are not normally accessible.
- Radiation and contamination conditions inside the transfer tube and under the spent fuel pool storage racks.

5.7.3 Auxiliary Building

The Auxiliary Building is located between the Unit 1 and Unit 2 containment structures. The main floor levels in the auxiliary building are at elevations 140, 100, 115, and 85 feet. Elevations 73, 60 and 55 feet are below ground level. Generally, one-half of the auxiliary building is a mirror image of the other, with each half of the structure containing equipment for one unit. The control room is located at the 140-ft elevation.

The Auxiliary Building includes radiological significant systems used to purity, control primary reactor coolant, mitigate the consequences of postulated accidents, and provide for safe shutdown including:

- Chemical and Volume Control System (CVCS)
- Reactor Makeup Control System
- Boron Recycle System
- Residual Heat Removal System
- Emergency Core Cooling System
- Liquid Radwaste System
- Gaseous Radwaste System

Radiological Discussion

All the systems that handle process and clean-up reactor coolant are highly contaminated. Liquid and gaseous radwaste systems concentrate radioactivity.

Gaseous radwaste handling and storage cubicles are exposed to high concentrations of radioactive gases, including tritium and C-14. Significant quantities and concentrations of radioactive liquids and sludge are routed to the auxiliary radwaste building sump. The levels of contamination in tanks, ion exchangers, and other components that are not normally accessible are currently unknown.

As discussed previously in Section 5.7.1, water from the Auxiliary Building roof gutters contained high concentrations of tritium (800,000 pCi/liter), which was attributed to washout and/or deposition from gaseous effluent. In recent annual effluent reports, tritium and C-14 have been identified as principal radionuclides in gaseous effluent. Although DCPP RP personnel have identified effluent deposition and washout as the source of tritium in roof gutter water, the potential for C-14 contamination via the same processes has not been evaluated.

Known and Potential Radiological Contaminants

Potential ROCs on the radiologically significant structures and components would be similar to those found in the reactor coolant system resin and filters: H-3, C-14, Cr-51, Fe-55, Mn-54, Co-57, C0-58, Co-60, Ni-59, Ni-63, Zn-65, Sr-89, and Sr-90.

Potential ROCs for surface contamination on low-to-moderately contaminated fuel handling building structures and components would be similar to DAW: Fe-55, Mn-54, Co-57, Co-58, Co-60, Ni-59, Ni-63, and Zn-65.

The lists of ROCs may be revised based on more definitive data collected during site characterization.

Contaminated Media

Potentially contaminated media include:

- Metal (piping, valves, and tanks)
- Concrete
- Sludge in the building sumps
- Gasket material

Impacted/Non-Impacted Classification

The Auxiliary Buildings and associated systems and components are classified as radiologically impacted areas and structures based on historical activities and use of radioactive materials during operating years.

Preliminary MARSSIM Classification

The Auxiliary Building and systems are not assigned MARSSIM classifications.

Data Gaps

- Radiological surveys and sample analyses for the Radwaste Building sumps
- Sampling and analysis crud layers on internal surfaces of systems, tanks, pumps, and piping carrying radioactive liquids
- Tritium and carbon-14 on exterior building surfaces

5.7.4 Turbine Building

The Turbine Building houses systems that are part of the steam and power conversion system designed to remove heat energy from the reactor coolant in the four steam generators and convert it to electrical power via the turbine-generator.

The high pressure turbines and the generators for DCPP Unit 1 and Unit 2 are manufactured by Siemens-Westinghouse Electric Corporation. The low pressure turbines have been retrofitted with Alstom rotors and casings.

The turbine building contains the main steam system piping, main steam isolation and check valves, and steam line safety valves. These systems include:

- Turbine-Generator
- Moister Separator Reheaters
- Main Condenser
- Condensate Polishing System
- Feedwater Reheaters
- Main Feedwater Pumps and Turbines
- Steam Generator Blowdown System

Radiological Discussion

Interviews with plant staff reported steam generator tube leaks occurred in the 1990s. An NRC inspection report dated 2003 noted a 6.5 gallon per day primary-to-secondary leak. Tube leaks create the potential for contaminating secondary systems structures. Based on experience at San Onofre Nuclear Generating Station, the most likely areas to become contaminated in the turbine building are the turbine building sumps. Less likely are the high conductivity and low conductivity sumps.

Known and Potential Radiological Contaminants

Potential ROCs for the Turbine Building area are tritium and carbon-14 because in the gaseous form they can carry over from the primary system. Potential ROCs may be revised based upon more definitive data collected during site characterization.

Contaminated Media

Potentially contaminated media include:

- Metal (piping, valves, and tanks)
- Concrete
- Sludge in the building sumps
- Gasket material

Impacted/Non-Impacted Classification

The Turbine Building and associated systems and components are classified as radiologically impacted.

Preliminary MARSSIM Classification

The Turbine Building, as well as all systems, structures, and components inside the building, are not assigned MARSSIM classifications.

Data Gaps

- Tritium and C-14 on exterior building surfaces.
- Tritium and C-14 on interior concrete surfaces.

SECTION 6 CHEMICAL FINDINGS

As presented in Section 5, *Radiological Findings*, this section identifies the storage location, practices, and areas where non-radiological materials could have been released to soils, groundwater, sediments, or surface water. Because the DTSC will oversee any remedial actions under their Voluntary Cleanup Program (VCP) these findings are presented by AOCs within the study areas as identified above. The AOCs are listed in Table 6.0-1, shown on Figure 6.0-1, and are described further below.

Table 6.0-1 Areas of Concern

AOC No.	AOC DESCRIPTION
1.0 North Owner Controlled Area (NOCA)	
1-1	Vehicle Maintenance Shop (Building No. 402) and "Man Camp" Area
1-2	Temporary Parking Areas
1-3	Sandblasting Area
1-4	500 kV Switchyard
1-5	230 kV Switchyard
1-6	WHAT Facility
1-7	Electrical Laydown Area
1-8	Tribar Flats
1-9	Biofouling Pile and Blind
1-10	Chlorination and Domestic Water Buildings
1-11	Polymetric Makeup Water System
1-12	Raw Water Reservoirs
1-13	Old Steam Generator Storage Facility
1-14	Former Asphalt Batch Area
2.0 South Owner Controlled Area	
2-1	Parking Lots
2-2	Former Fire Department/Current Facility Maintenance
2-3	Shooting Range
2-4	Building 113 (WarehouseB)
2-5	Fuel Dispensing Area
2-6	Sandblasting Area
2-7	Miscellaneous Outbuildings and Concrete Batch Plant
3.0 West Owner Controlled Area (WOCA)	
3-1	Intake Maintenance Building and Maintenance Shop
3-2	Above ground Storage Tanks (biofouling system)
3-3	Parking Lots
3-4	Maintenance Building (No. 119), Annex and AST
3-5	Boat Slip
3-6	Hazardous Waste Storage Building (Building No. 120)
3-7	Sand Blasting and Spray Painting Facility

AOC No.	AOC DESCRIPTION (CONTINUED)
3-8	GC Fabrication Shop
3-9	RO Operations
3-10	Turbine Generator Equipment Warehouse
3-11	Sewage Treatment Plant
4.0 Discharge Cove Area (DCA)	
4-1	Diablo Cove Sediments and Shell Waste
5.0 North Protected Area (NPA)	
5-1	Former and Current Diesel USTs
5-2	ASTs Associated with Resin Polish System
5-3	Unit 1 Transformer Yard and OWS
5-4	Unit 2 Transformer Yard and OWS
5-5	Radiological Controlled Area -Tanks
5-6	Boron Spill Area
5-7	Hazardous Waste Storage and Handling Area
5-8	Laundry and Rad Waste Buildings (Nos. 117 A/B/C)
5-9	Warehouse A and Adjacent Areas
5-10	Auxiliary Boiler Enclosure
6.0 South Protected Area (SPA)	
6-1	Main Warehouse
6-2	Liquid Storage (Building No. 127)
6-3	Cold Machine Shop and Former UST
6-4	Paint Department and Laydown Area
6-5	Temporary Parking Area
7.0 Power Block Area (PBA)	
7-1	Oil Water Separator
7-2	Underground Piping
7-3	Underground Sumps
7-4	Resin systems Sumps
7-5	Inground Turbine Oil Collection Structures
8.0 Site Wide Areas	
8-1	Groundwater
8-2	Transformers
8-3	Surface Water/Stormwater
8-4	Diablo Creek
9.0 North Site Area (NSA)	
9-1	Archeological Site
9-2	Former Wastewater Pond, Associated Piping and Fire Training Area
9-3	Water Well No. 1
9-4	Farmland
9-5	GC Electrical Yard
10.0 South Site Area (SSA)	
10-1	Leaching Field
10-2	Various Satellite Target Areas
10-3	Bioremediation Area
10-4	Farmland

6.1 NOCA AREAS OF CONCERN

Fourteen AOCs were identified within the NOCA as shown on Figure 6.1-1 and discussed in detail below.

6.1.1 Vehicle Maintenance Shop and Man Camp Area

Chemicals are stored and used in the Vehicle Maintenance Shop and in the adjacent "Man Camp" area (AOC 1-1) shown on Figure 6.1-1. The vehicle maintenance shop is well maintained, with liquids stored in appropriate containers. Waste oils generated during vehicle maintenance activities are reportedly drummed and transferred to the hazardous waste storage facility for off-site recycling or disposal. No floor drains were observed within the building however; a trench drain is present outside the overhead door on the south side of the building. The Man Camp area, located west of the vehicle maintenance, is an unpaved area used for steam cleaning, and equipment storage including portable lighting units and generators.

Potential COCs include solvents used to clean/degrease equipment, petroleum-based lubricants, hydraulic fluids, waste oils and fuel oils.

Potential source area and migration pathway to impact soils, sediments, surface water or groundwater

During review of site files, Action Requests indicated several releases have occurred in this AOC. Releases reported included a 40-gallon diesel fuel spill west of the vehicle maintenance shop; a diesel release from a portable tank in the Man Camp; and a broken effluent pipe. Potentially contaminated media include soils and groundwater.

Potential COCs for this AOC include volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), Total Petroleum Hydrocarbons (TPH), Title 22 California Assessment Manual metals (Title 22 metals), and Polychlorinated biphenyls (PCBs).

Data Gaps

Soil and groundwater samples should be collected for the analytes listed above to confirm/deny potential significant releases to environmental media.

6.1.2 Temporary Parking Lots

There are several temporary parking lots (AOCs 1-2-1 through 1-2-3) located within the NOCA. In addition to parking, these areas are used for temporary storage and equipment staging. Most of these areas are not paved.

Potential source area and migration pathway to impact soils, sediments, surface water or groundwater

COCs may have been released to the ground through equipment failures, spills, overfills, or leaks. Potentially contaminated material includes shallow soils, surface water and sediments.

Potential COCs for this AOC include VOCs, SVOCs, Title 22 metals, and TPH.

Data Gaps

Soil and sediment samples should be collected for the analytes listed above to confirm/deny potential significant releases to environmental media.

6.1.3 Abrasive Sandblasting Area

Outdoor abrasive sandblasting activities are performed in AOC 1-3 of the NOCA. Abrasive blasting operations can create high levels of silica dust. Additionally, the surfaces being blasted may contain COCs such as metals that may have accumulated in surrounding soils over the years.

Potential source area and migration pathway to impact soils, sediments, surface water or groundwater

COCs such as metals may be transported from the sandblasting area via dust in the air and surface water runoff, potentially impacting surrounding soils, surface water and sediments.

Potential COCs for this AOC include Title 22 metals.

Data Gaps

Soil and sediment samples should be collected and analyzed for Title 22 metals to confirm/deny potential significant releases to environmental media.

6.1.4 500 kV Switchyard

The 500-kV switchyard (AOC 1-4) is reportedly going to remain in place following decommissioning activities at the Site. It is our understanding that electrical equipment within this switchyard is currently filled with non-PCB fluids however; oils released from the transformers, insulators, and capacitors contain mineral oils and may contain residual PCBs. If released through drips or damaged parts, PCBs could be released from the shallow soils and over time migrate to groundwater. Additionally, herbicides are also commonly used for weed suppression, and although recent and acceptable products have a short half-life and are not anticipated to impact the environment, historically other products may have been used.

Potential source area and migration pathway to impact soils, sediments, surface water or groundwater

Shallow soils could also be carried via stormwater, with the PCBs (adsorbed to the sediments) being deposited in the sediments of Diablo Creek at the outfalls.

Potentially contaminated media include soil, sediment, surface water, and groundwater.

Data Gaps

Soils in an around the Switchyard, sediments and surface water in Diablo Creek, and groundwater should be evaluated for PCBs and other fuel oils and lubricants.

6.1.5 230 kV Switchyard

The 230 kV Switchyard (AOC 1-5) is scheduled for removal as part of the decommissioning activities. Although transformers located within this switchyard are reportedly filled with non-PCB fluids, oils released from the transformers, insulators, and capacitors contain mineral oils and may contain residual PCBs. If released through drips or damaged parts, PCBs could be released from the shallow soils and over time migrate to groundwater. Additionally, herbicides are also commonly used for weed suppression, and although recent and acceptable products have a short half-life and are not anticipated to impact the environment, historically other products may have been used.

Potential source area and migration pathway to impact soils, sediments, surface water or groundwater

Shallow soils could also be carried via stormwater, with the PCBs (adsorbed to the sediments) being deposited in the sediments of Diablo Creek at the outfalls.

Potentially contaminated media include soil, sediment, surface water, and groundwater.

Data Gaps

Soils in an around the Switchyard, sediments and surface water in Diablo Creek, and groundwater should be evaluated for PCBs and other fuel oils and lubricants.

6.1.6 WHAT Facility

As described in Section 5.1.2, the WHAT system (AOC 1-6) is comprised of three 125,000-gallon fiberglass treatment and storage tanks and one 17,000-gallon steel decant tank located within secondary containment. The WHAT tanks process wastewater from the Turbine Building drains: caustic solutions (i.e. sodium hydroxide) from plant operations; wastewater from the reverse osmosis (RO) plant; and other non-radioactive wastewater from plant operations and maintenance. In 1995, the facility and auxiliary piping were closed in accordance with the PG&E Approved Closure Plan as presented in the Final Hazardous Waste Permit for DCPP (30 June 1994). Closure activities included concrete core slab and subsoil sampling. Results indicated no residual contamination of the permitted area had occurred. The facility has continued to process wastewater as a non-hazardous storage waste unit following the Resource Conservation and Recovery Act (RCRA) closure.

Wastewater, chemicals, and oil containing equipment are currently stored and used in this area. Above-ground storage tanks (ASTs) containing caustics and acids are located within secondary containment in the building however; the coating on the caustic tank is suspected of containing asbestos. Additionally, sludge within the system was determined to be impacted with ROCs (Co-60).

Potential source area and migration pathway to impact soils, sediments, surface water or groundwater

Any releases of impacted wastewater to the ground via overflow, leaks or faulty equipment could result in impacted soils; sediment or groundwater in the area. Staining was observed around equipment within the WHAT facility indicating releases have occurred to the concrete floor slab. COCs may have migrated through floor penetrations and/or cracks impacting sub-slab soils.

Potentially contaminated media include soil, sediment and groundwater.

Data Gaps

Sub-slab soil samples, sediment samples from the oil/water separator discharge point as well as groundwater in this AOC should be evaluated for Title 22 metals, TPH, SVOCs and PCBs.

6.1.7 Electrical Laydown Area

The Electrical Laydown Area (AOC 1-7) is an unpaved area, located within the NOCA, which is used for equipment and cargo containers.

Potential source area and migration pathway to impact soils, sediments, surface water or groundwater

COCs may have been released to the ground through equipment failure, spills, overfills, or leaks. Potentially contaminated material includes shallow soils, surface water and sediments.

Potential COCs for this AOC include VOCs, SVOCs, Title 22 metals, TPH and PCBs.

Data Gaps

Soil samples should be collected for the analytes listed above to confirm/deny potential significant releases to environmental media. If soil samples indicate COCs above applicable standards, then surface water samples should be collected for the corresponding analytes of concern.

6.1.8 Tri-Bar Flats

The Tri-Bar Flats Area (AOC 1-8) is a gravel covered area used for general storage. According to employees interviewed as part of this HSA, this area was also a dumping ground for soil and debris generated during various construction projects; and sludge/sediments from WHAT tanks and the Turbine Building sump. Additionally, stormwater runoff from this area is collected via a storm drain, which discharges to Diablo Creek.

Potential source area and migration pathway to impact soils, sediments, surface water or groundwater

Storage and/or disposal of debris or impacted soils and sludges generated from the cleaning of sumps, WHAT tanks, and various construction projects on-site could result in the leaching of COCs into soils, sediments and groundwater.

Potential COCs for this AOC include Title 22 metals, VOCs, SVOCs, TPH and PCBs.

Data Gaps

Soil and sediment samples should be evaluated for Title 22 metals, VOCs, SVOCs, TPH and PCBs to determine if significant releases have occurred, impacting environmental media. If soil or sediment samples indicate COCs above applicable standards, then surface water samples should be collected for the corresponding analytes of concern.

6.1.9 Biofouling Pile and Blind

The biofouling pile is an area where the scrapings from the accumulation of microorganisms, plants, algae or animals on the surface of the intake tunnels and system are stockpiled to drain and decay on a concrete slab (AOC 1-9). Run off from this area and adjacent AOCs drain to the blind. The blind is an unlined area located to the east of the biofouling pile. According to personnel interviewed as part of this HSA, this area is periodically (approximately every 3 years) is cleaned out and material is shipped off-site for disposal.

Potential source area and migration pathway to impact soils, sediments, surface water or groundwater

Water runoff from this area could impact surrounding soil and sediment with elevated levels of both organics and inorganics such as nitrates.

Data Gaps

Soil and sediment samples should be evaluated for VOCs, SVOCs, TPH, Title 22 metals and inorganic parameters (nutrients) to determine if significant releases have occurred, impacting environmental media.

6.1.10 Chlorination and Domestic Water Buildings

Water treatment chemicals are stored and used in this area (AOC 1-10). The main chlorination tank has had a history of chronic leakage. It is not believed that the use of water treatment chemicals would have significantly impacted the environment: soils would have buffered the extreme pH, and any discharges to site waters would no longer be measurable. The concrete pad beneath the leaking tank is expected to be chlorine saturated and may require characterization before disposal. Potential COCs include bleach, oils and metals.

Potential source area and migration pathway to impact soils, sediments, or groundwater

Spills, leaks, equipment failure and overflows of tanks and/or sumps may have resulted in releases of potential COCs (i.e. bleach, petroleum-based oils, hydraulic fluids, etc.) to the ground and site waters.

Data Gaps

Based on current site knowledge of the processes used in these building for chlorination and because a history of spills, leaks, equipment failure, and overflows does not exist, no additional characterization is warranted.

6.1.11 Polymetric Make-up Water System

The Polymetric Make-up Water System (AOC 1-11) located near the reservoirs, is used for water filtering and water treatment. Some caustic based chemicals (dry form) have been historically used here.

Potential COCs in this AOC include caustics and minerals/metals from the filtration process. It is not believed that the use of water treatment chemicals would have significantly impacted the environment: soils would have buffered the extreme pH, and any discharges to site waters would no longer be measurable.

Potential source area and migration pathway to impact soils, sediments, surface water or groundwater

Spills, leaks, equipment failure and overflows of tanks and/or sumps may have resulted in releases of potential COCs (i.e. petroleum-based oils, hydraulic fluids, pH buffers, etc.) to the ground and surface water. Based on current site knowledge of the processes and previous use of dry form caustic-based chemicals in this area, the pH of surface soil should be characterized.

Data Gaps

6.1.12 Raw Water Reservoirs

As discussed in Section 5.1.4, the Raw Water System consists of two reservoirs, each with a capacity of 2.5 million gallons (AOC 1-12). The Raw Water reservoirs receive water primarily from the Sea Water Reverse Osmosis system and the Pretreatment System, which has a multimedia filter and chlorination injection to minimize algae growth and fouling of filters with slime. The reservoir liners have required several repairs over the years in the form of epoxy or epoxy-like sealing.

Potential source area and migration pathway to impact soils, sediments, surface water or groundwater

Water and epoxy applications could infiltrate the reservoir liners and impact subsoil. COCs for this AOC include VOCs, SVOCs and metals.

Data Gaps

Evaluate subsoil for VOCs, SVOCs, and Title 22 Metals upon closure of the reservoirs.

6.1.13 Old Steam Generator Storage Facility

The Old Steam Generator Storage Facility (AOC 1-13) and adjacent outside areas are impacted with ROCs based on historical events and storage of radioactive materials during operating years as discussed in Section 5.1.1. Reports of water infiltrating into the building and collecting in sumps were encountered during research conducted as part of this HSA. This area was also used as an equipment laydown area.

Potential source area and migration pathway to impact soils, sediments, surface water or groundwater

Releases to the ground occurred from leaching and spills. Additionally, COCs leaching from contaminated equipment stored in this facility may have been transported via water that infiltrated the building.

Potential media impacted includes soil, sediment and groundwater.

Data Gaps

Soil samples should be evaluated for TPH and Title 22 metals to determine if significant releases have occurred, impacting environmental media. If soil samples indicate COCs above applicable standards, then sediment and groundwater samples should be collected for the corresponding analytes of concern.

6.1.14 Former Asphalt Batch Area

During site personnel interviews conducted as part of this HSA, an area within the NOCA (AOC 1-14) was identified as a former asphalt batch area that was used during the construction of the ISFSI. Asphalt contains petroleum compounds as well as SVOCs.

Potential source area and migration pathway to impact soils, sediments, surface water or groundwater

Asphalt batching operations may have resulted in releases of petroleum and SVOCs to the ground.

Potential media impacted includes soil and groundwater.

Data Gaps

Soil should be evaluated for SVOCs and TPH to determine if a release has occurred significantly impacting environmental media. If soil samples indicate COCs above applicable standards, then groundwater samples should be collected for the corresponding analytes of concern.

6.2 SOCA AREAS OF CONCERN

Seven AOCs were identified within the SOCA as shown on Figure 6.2-1 and discussed below.

6.2.1 Parking Lots

There are several parking lot areas (AOCs 2-1-1 through 2-1-4) located within the SOCA. In addition to parking, these areas are used for temporary storage and equipment staging. Portions of these areas are not paved.

Potential source area and migration pathway to impact soils, sediments, surface water or groundwater

COCs may have been released to the ground through equipment failure, spills, overfills, or leaks. Potentially contaminated material includes shallow soils, surface water and sediments.

Potential COCs for this AOC include VOCs, SVOCs, Title 22 metals, and TPH.

Data Gaps

Soil and sediment samples should be collected for the analytes listed above to confirm/deny potential significant releases to environmental media.

6.2.2 Former Fire Department/Current Facility Maintenance

Site building No. 251 (AOC 2-2), formerly the "Industrial Fire Operations" garage, is currently used by the facility maintenance department for equipment and supplies storage as well as maintenance operations.

Potential source area and migration pathway to impact soils, sediments, surface water or groundwater

Based on the current and past use of this building for equipment storage and maintenance activities, COCs may have been released to the floor via leaks, spills, overfills, wash waters, or equipment failures. COCs may have migrated through the concrete floor via cracks or penetrations, potentially impacting sub-slab soils.

Potential COCs for this area include PFOAs, VOCs, SVOCs, TPH and Title 22 metals.

Data Gaps

At the time of building demolition, sub-slab soils should be evaluated for evidence of a release. If staining or odors are noted, soil samples should be collected and analyzed for the COCs identified above.

6.2.3 Shooting Range

The shooting range (AOC 2-3) is located within the SOCA as shown on Figure 6.2-1. The range is comprised of four areas identified as the lower range, the upper range, the hillside range and the remote range. The hillside and remote ranges fall within the SSA and are discussed in Section 6.10.2. Structures associated with the shooting range include a shelter area and training facility.

According to an Action Request (No. A0363729), in February 1995, sand used in the traps on the range contained concentrations of lead, antimony and arsenic that exceeded the Title 22 Total Threshold Limit Concentration (TTLC) California hazardous waste classification criteria for total metal concentrations. The sand was removed and disposed of as hazardous waste.

In December 2006, an evaluation of the shooting range activities NPDES pathways was performed. Upon completion of the evaluation, it was determined that additional action was necessary to maintain California Ocean Plan Compliance and prepare for renewal of the NPDES discharge permit. A range vacuuming effort was taken in the Fall of 2007 in which 38 yards of lead-impacted silt and sediment was collected for off-site disposal.

In 2010 a stabilization project removed hundreds of yards of contaminated soil and range infrastructure debris. New target sets were installed and area was repaved. Before repaving, soil samples from areas in the vicinity of the targets, primary impact berms and from the asphalt lined stormwater conveyance channel. Samples were analyzed for Title 22 California Assessment Manual (Title 22) 17 Metals and Toxicity Characteristic Leaching Procedure (TCLP) metals which were the primary COCs. Results were compared to TTLC; Soluble Threshold Limit Concentration (STLC) California hazardous waste classification for leachable concentrations; RCRA hazardous waste classification criteria; and California Ocean Plan (California State Water Resources Control Board; CalEPA) limit for lead. Total metal exceedances included lead, copper and antimony. Leachable lead concentrations exceeded both the

STLC and RCRA hazardous waste criteria. Lead exceeded the TTLC and California Ocean Plan screening levels in samples collected from the stormwater conveyance channel.

Potential source area and migration pathway to impact soils, sediments, surface water or groundwater

Potentially contaminated media include lead and other metal impacts in the sand traps (and surrounding soils) as well as metal and perchlorate in the shallow soils on the floor of the range.

Due to the elevated levels reported in the sand and soil, it is likely that lead has leached into the vadose zone, reaching the groundwater. Additionally, the nearby sediments and surface waters could also be impacted via stormwater runoff and should be re-evaluated.

Data Gaps

Based on the historical use of the shooting range and the available lead data, the following data gaps should be addressed:

- Soil and groundwater in the shooting area should be evaluated for VOCs, metals, and perchlorate.
- Soil in the hillside behind the ranges should be evaluated for Title 22 metals.
- Groundwater below and downgradient of the shooting range facility should be tested for lead and perchlorate.
- Sediments in nearby catch basins and drainage ditches should be tested for lead, and perchlorate (if detected in groundwater).

6.2.4 Warehouse B (Building 113)

As mentioned in Section 5.2.2, Warehouse B (AOC 2-4) was recently remodeled. The entire structure was removed and replaced. However; the concrete floor slab was left in place. Information obtained during the HSA indicates that containerized radioactive and other materials were stored in Warehouse B. The new building currently houses Access Authorization and Fitness-For-Duty offices, the Fire Station, and storage of Fukushima FLEX equipment.

Potential source area and migration pathway to impact soils, sediments, surface water or groundwater

Chemicals and RAM were formerly handled and stored in this facility. Additionally, fire equipment including fire suppressing foam are stored in the building as well as heavy equipment. Releases of COC to the concrete floor slab could migrate into sub-slab soil via floor penetrations, drains and/or cracks.

Data Gaps

Before demolition, soil gas samples should be analyzed for VOCs. At the time of building demolition, sub-slab soils should be evaluated for various COCs including VOCs, SVOCs, TPH, PCBs and Title 22 Metals.

6.2.5 Fuel Dispensing Area

A fuel dispensing area (AOC 2-5) consisting of one gasoline and one diesel AST, within secondary containment, is located within the SOCA (Figure 6.2-1). During the HSA, several Action Reports were encountered regarding spills/releases at the fuel dispensing area including a 50-gallon diesel spill on 15 March 1991 (AR A0223131) resulting in remediation. Improvements such as the installation of a concrete pad and drainage basin with drainage shutoff valve have been made over time, however; historically releases to the ground have occurred.

Potential source area and migration pathway to impact soils, sediments, surface water or groundwater

COCs may have been released to the ground through spills, overfills, or leaks. Potentially contaminated material includes soils, groundwater, surface water and sediments.

Potential COCs for this AOC include VOCs and TPH.

Data Gaps

Soil, groundwater and sediment samples should be collected for VOCs and TPH to confirm/deny potential significant releases to environmental media.

6.2.6 Abrasive Sandblasting Area

Outdoor abrasive sandblasting activities were performed in AOC 2-6 of the SOCA. Although recent improvements were made to this area such as the addition of sidewalls, abrasive blasting operations can create high levels of silica dust. Additionally, the surfaces being blasted may contain COCs such as metals that may have accumulated in surrounding soils over the years.

Potential source area and migration pathway to impact soils, sediments, surface water or groundwater

COCs such as metals may be transported from the sandblasting area via dust in the air and surface water runoff, potentially impacting surrounding soils, surface water and sediments.

Potential COCs for this AOC include Title 22 metals and TPH.

Data Gaps

Soil, sediment and groundwater samples should be collected for the analytes listed above to confirm/deny potential significant releases to environmental media.

6.2.7 Miscellaneous Outbuildings and Concrete Batch Plant

Several small outbuildings (sheds) on slab are present within the SOCA (Figure 6.2-0) as well as an area used for concrete batching and wash out. The concrete batch plant is assumed to have been in operation during the construction of the plant. Additionally, some paints, drums of "non-hazardous" water and other chemicals were observed in storage at these locations.

Potential source area and migration pathway to impact soils, sediments, surface water or groundwater

Releases of COCs may have occurred in and around these buildings due to damaged containers, spills, or equipment failure and impacts to environmental media from the concrete batching and wash out operations.

Potential COCs for this AOC include VOCs, SVOCs, Title 22 metals, and TPH.

Data Gaps

Soils should be evaluated in areas where drums were stored outside and/or evidence of a release (i.e. staining, odors) are observed.

6.3 WOCA - AREAS OF CONCERN

Eleven AOCs were identified within the WOCA as shown on Figure 6.3-1 and described in detail below.

6.3.1 Intake Maintenance Building and Maintenance Shop

Oils, lubricants, paints and solvents are stored and used in maintenance operations (AOC 3-1) at the intake structure. Sumps are present in the maintenance shop to collect and contain wastewater or spills.

Potential source area and migration pathway to impact soils, sediments, surface water or groundwater

Releases of COCs to the building floors could migrated to sub-slab soils through floor penetrations and or cracks. Potential COCs for this AOC include VOCs, SVOCs, Title 22 metals, and TPH.

Data Gaps

Sub-slab soils should be evaluated for evidence of a release (i.e. staining, odors) at the time of demolition to determine if soils are impacted. If impacts are observed, soils and groundwater should be tested for the COCs.

6.3.2 Above-ground Storage Tanks (Biofouling System)

ASTs (AOC 3-2) containing chemicals used in the biofouling system (sodium hypochlorite and sodium bromide) are stored at the intake structure. These chemicals are injected into seawater at the plant intake conduits to control macrofouling in the circulated water system.

Potential source area and migration pathway to impact soils, sediments, surface water or groundwater

Although significant releases of either chemical would be toxic to aquatic organisms, a release to soil would not result in significant, long-lasting impacts. No reports of significant spills were encountered at the time of this HSA however; there have been chronic small leaks associated with these ASTs.

Data Gaps

Based on current site knowledge of the processes and type of chemicals, it is not believed that any data gaps exist. Chronic small leaks from the ASTs have likely saturated the underlying concrete. The slab beneath the ASTs and underlying soil should be characterized at the time of removal.

6.3.3 Parking Lots

Several parking areas were identified within the WOCA (AOC 3-3-1 through AOC 3-3-6). In addition to vehicle parking, these areas are used for temporary storage and equipment staging. Many of these areas are not paved.

Potential source area and migration pathway to impact soils, sediments, surface water or groundwater

COCs may have been released to the ground through equipment failure, spills, overfills, or leaks. Potentially contaminated material includes shallow soils, surface water and sediments.

Potential COCs for this AOC include VOCs, SVOCs, Title 22 metals, and TPH.

Data Gaps

Soil and sediment samples should be collected for the analytes listed above to confirm/deny potential significant releases to environmental media.

6.3.4 Maintenance Building (No. 119), Annex and AST

Building No. 119, the associated Annex, and AST (AOC 3-4) are located within the WOCA. Building No. 119 is mainly used as office space and training facilities, however; there is a maintenance shop/garage area with overhead door at the western end where small quantities of chemicals (oils, lubricants, paints, etc.) are currently in storage. A training chemistry wet lab and associated 2,000-gallon wastewater AST are also located in and adjacent to Building No. 119. On 30 September 2003, the AST was removed from service and reportedly clean-closed in accordance with the requirements of the Approved Facility Closure Plan. AST closure activities included the cleaning of building drain lines associated with the former wastewater storage tank system as well as the collection and analysis of concrete core samples from the containment berm directly below the former AST. Results confirmed that the containment was not contaminated during unit operations.

Potential source area and migration pathway to impact soils, sediments, surface water or groundwater

COCs may have been released to the environment via spills, leaks, overfills or equipment failure. COCs could have migrated through drains, cracks or penetrations in the floor, secondary containment, or asphalt potentially impacting surrounding soil.

Potential COCs in this area include VOCs, SVOCs, TPH and Title 22 metals.

Data Gaps

At the time of demolition, building sub-slab soils should be evaluated for evidence of impacts (i.e. staining or odors). If observed, soil samples should be collected and analyzed for the COCs listed above. There are no data gaps regarding the former AST.

6.3.5 Boat Slip

A boat slip (AOC 3-5) is located at the southern end of the intake cove as shown on Figure 6.3-1. ASTs containing gasoline and diesel as well as fuel dispensing equipment are present. The ASTs are located within secondary containment. According to files reviewed and interviews conducted as part of this HSA, several small (less than 1 gallon) releases of fuel to the cove has occurred over the years of operation. Additionally, some marine-type batteries have been recovered from the water in the slip area.

Potential source area and migration pathway to impact soils, sediments, surface water or groundwater

Releases to the surface water were contained and cleaned up when possible; however; disposal/accidental release of batteries and repeated small releases in the boat slip area may have impacted sediment.

Potential COCs in this area include TPH and Title 22 metals.

Data Gaps

Sediments in the boat slip area should be evaluated for impacts from Title 22 metals (mercury, lead) and TPH to confirm/deny potential significant releases to environmental media.

6.3.6 Hazardous Waste Storage Building

The Hazardous Material Storage Building (No. 120) (AOC 3-6) is located with WOCA as shown on Figure 6.3-1. This building is currently used to store chemicals and hazardous waste for periods greater than 90 days and is considered a Resource Conservation Recovery Act (RCRA) Storage Area. The building floor lies directly on the soils (i.e. “slab on grade”) and is sealed in accordance with permit requirements.

Chemicals stored in this building include paints, thinners, solvents, laboratory chemicals, process chemicals, lubricants, degreasers, hydraulic fluids, etc.

Potential source area and migration pathway to impact soils, sediments, surface water or groundwater

Chemicals stored in the building were maintained in clean areas, with liquids stored in appropriate containers. However, if leaks occurred, soils immediately adjacent, and especially outside the doorways could have been impacted.

Potentially contaminated media include soils and groundwater. Soils outside the original storage areas and soils and groundwater around the current storage area could have been impacted by non-radiological material. Potential COCs for this AOC include VOCs, SVOCs, Title 22 metals, and PCBs.

Data Gaps

Soil and groundwater samples should be collected for the analytes listed above to confirm/deny potential significant releases to environmental media.

6.3.7 Sand Blasting and Spray Painting Facility

The sandblasting and painting facility (AOC 3-7) is a single-floor warehouse on slab with a floor sump and several overhead doors. Sandblasting and spray painting operations are performed within the structure. Hazardous wastes and paints are also handled and stored at this facility.

Abrasive blasting operations can create high levels of silica and metal dusts. If any of these operations were performed with overhead doors open or outside the building, COCs may have accumulated in surrounding soils. Releases of paints or hazardous materials to the floor may have migrated through penetrations or cracks in the slab potentially impacting sub slab soils.

Potential source area and migration pathway to impact soils, sediments, surface water or groundwater

COCs such as metals may be transported from the sandblasting area via dust in the air and surface water runoff, potentially impacting surrounding soils or COCs were released to the floor, they may have migrated to sub-slab soil via penetrations or cracks in the slab.

Potentially contaminated media include soils and groundwater. COCs include VOCs, SVOCs, Title 22 metals and TPH.

Data Gaps

Soil and sediment samples should be collected and analyzed for the COCs listed above to confirm/deny potential significant releases to environmental media.

6.3.8 GC Fabrication Shop

The GC Fabrication Shop (AOC 3-8) is a single floor warehouse on slab. Metals cutting, welding, molding, etc. is conducted at this facility. The facility houses small quantities of lubricants as well as a satellite hazardous waste accumulation storage area. During the HSA, several Action Requests were encountered indicating small spills of cutting oil have occurred within this facility. Additionally, during the HSA site visit, staining was observed on the asphalt surrounding an outdoor welding booth area.

Potential source area and migration pathway to impact soils, sediments, surface water or groundwater

COCs such as metals may be transported from metal cutting, welding, molding, etc. areas via dust in the air, potentially impacting surrounding soils or sediments. Additionally, if COCs were released to the floor, they may have migrated to sub-slab soil via penetrations or cracks in the slab.

Potentially contaminated media include soils and groundwater. Potential COCs include VOCs, Polyaromatic Hydrocarbons (PAHs), Title 22 metals and TPH.

Data Gaps

Soil and sediment samples should be collected and analyzed for the COCs listed above to confirm/deny potential significant releases to environmental media.

6.3.9 Reverse Osmosis Operations

RO operations (AOC 3-9) supply all of the facility's demineralized and domestic water needs.

Potential COCs in this AOC include metals from the demineralization process. It is not believed that the use of caustics, acids, and other water treatment chemicals would have impacted the environment: soils would have buffered the extreme pHs, and any discharges to site waters would no longer be measurable.

Potential source area and migration pathway to impact soils, sediments, surface water or groundwater

Spills, leaks, equipment failure and overflows of tanks and/or sumps may have resulted in releases of potential COCs to the ground and surface water.

Data Gaps

Based on current site knowledge of the process and type of chemicals, it is not believed that any data gaps exist.

6.3.10 Turbine Generator Equipment Warehouse

The Turbine Generator Equipment Warehouse (AOC 3-10) is located within the WOCA. This warehouse is used to store several reactor coolant pump related components, including a pump impeller, rotating assembly, and motor. In 2015, the cask transporter, also stored in this building, leaked hydraulic fluid to one of the floor drains.

Potential source area and migration pathway to impact soils, sediments, surface water or groundwater

Releases of COCs (i.e. hydraulic fluids, petroleum-based oils, etc.) to the building floors and drains could migrate to sub-slab soils through floor penetrations and/or cracks.

Data Gaps

Sub-slab soils should be evaluated for evidence of a release (i.e., staining, odors) at the time of demolition to determine if soils are impacted with COCs including the following: VOCs, SVOCs, Title 22 metals and TPH.

6.3.11 Sewage Treatment Plant

A sewage treatment plant (AOC 3-11) with a concrete sewage holding tank is located within the WOCA as shown on Figure 6.3-1.

Potential source area and migration pathway to impact soils, sediments, surface water or groundwater

As the sludge from the sewage settles, the liquid has the potential to infiltrate to the underlying soils to groundwater. The sludge is monitored for radionuclides, but it also has the potential to contain elevated metals and nutrients (e.g. nitrates, etc.).

Data Gaps

There are currently no groundwater monitoring wells downgradient of the holding tank. Downgradient water should be evaluated for Title 22 metals and nutrients. Soil samples from below the holding tank will likely be warranted once the treatment plant is closed.

6.4 DCA - AREAS OF CONCERN

One AOC has been identified within the DCA as discussed below and shown on Figure 6.4-1.

6.4.1 Diablo Cove Sediments and Shell Waste

Diablo Creek receives stormwater runoff from the northern portion of the site (NOCA, NPA and NSA). The creek then discharges to Diablo Cove (AOC 4-1) in addition to the cooling water discharged from the plant. Shell wastes from the cooling water system are also deposited in this area and have accumulated over time.

Potential source area and migration pathway to impact soils, sediments, surface water or groundwater

COCs from site operations could be mobilized to the DCA via stormwater runoff or cooling water discharge, potentially impacting sediments within the cove.

Potential COCs for this AOC include VOCs, SVOCs, TPH, PCBs and Title 22 metals. Additional sampling should also be completed to identify background concentrations for naturally occurring benthic materials.

Data Gaps

Sediment samples from the DCA should be collected and analyzed for the COCs listed above to confirm/deny potential significant releases to environmental media.

6.5 NPA- AREAS OF CONCERN

Ten AOCs have been identified within the NPA as shown on Figure 6.5-1 and described below.

6.5.1 Former and Current Diesel Underground Storage Tanks (USTs)

There are two 50,000-gallon diesel fuel USTs (AOC 5-1) located outside the Unit 1 Turbine Building Buttress (below the 85' elevation) as shown on Figure 6.5-1. The tanks were installed in late 1996 and early 1997. These tanks were installed to replace three carbon steel USTs that had leaked diesel fuel. Although remediation of the petroleum-impacted soil was conducted at the time, site personnel interviewed as part of this HSA believe impacted soil was left in place that extended beneath the Turbine Building.

Potential COCs related to diesel fuel include SVOCs (PAHs) and TPH.

Potential source area and migration pathway to impact soils, sediments, surface water or groundwater

Diesel was released to subsurface soil via leaks from the USTs. Petroleum may have leached into area groundwater.

Data Gaps

The extent of petroleum contamination in soil and groundwater should be further investigated to evaluate remedial options.

6.5.2 ASTs Associated with Resin Polish System

Dechlorination chemical ASTs (AOC 5-2) for both Units 1 and 2 are located on the west side of the Turbine Building, at the north and south ends (Figure 6.5-1). The ASTs contain sodium bisulfite.

It is not believed that the use of caustics, acids, and other water treatment chemicals would have impacted the environment as soils would have buffered the extreme pH, and any discharges to site waters would no longer be measurable.

Potential source area and migration pathway to impact soils, sediments, surface water or groundwater

Spills, leaks, equipment failure and overflows of tanks and/or sumps may have resulted in releases of potential COCs to the ground and surface water.

Data Gaps

Based on current site knowledge of the process and type of chemicals, it is not believed that any data gaps exist.

6.5.3 Unit 1 Transformer Yard and Oil Water Separator

The Unit 1 transformer yard and oil water separator (AOC 5-3) is located off the northeast corner of the Turbine Building. There have been reports of equipment failures and fires resulting in the release of transformer oils to the ground and Diablo Creek in 1995. Additionally, according to site personnel interviews conducted as part of this HSA, approximately 35,000 gallons of radiologically-impacted water was released to this area from an accidental release to the floor drain in the Fuel Handling Building.

Potential source area and migration pathway to impact soils, sediments, surface water or groundwater

There have been documented releases of transformer oils and ROC impacted water to this area. Additionally, fire suppression foam was reportedly applied to extinguish a transformer fire.

Potential COCs for this AOC include VOCs, SVOCs (PAHs), PFOAs, PCBs, TPH and Title 22 metals.

Data Gaps

Evaluate soil and groundwater for the COCs noted above to confirm/deny potential significant releases to environmental media.

6.5.4 Unit 2 Transformer Yard and Oil Water Separator

The Unit 2 transformer yard and oil water separator (AOC 5-4) is located off the southeast corner of the Turbine Building. There have been reports of equipment failures and fires resulting in the release of transformer oils to the ground in this area. Releases and runoff in this area drain to a passive oil water separator which then discharges to Diablo Creek.

Potential source area and migration pathway to impact soils, sediments, or groundwater

There have been documented releases of transformer oils and ROC impacted water to this area. Runoff from this area likely contains COCs that are directed to the oil water separator before discharging to site stormwater paths. Additionally, fire suppression foam was reportedly applied to extinguish a transformer fire in this AOC in 2008.

Potential COCs for this AOC include VOCs, SVOCs (PAHs), PFOAs, PCBs, TPH and Title 22 metals.

Data Gaps

Evaluate soil and groundwater as well as sediment at the discharge location to Diablo Creek for the COCs noted above to confirm/deny potential significant releases to environmental media.

6.5.5 Radiologically Controlled Area Tanks

The Units 1 & 2 Tank Farms (AOC 5-5) include the Units 1 & 2 Primary Water Tanks, Units 1 & 2 Condensate Storage Tanks, Units 1 & 2 Refueling Water Storage Tanks, and a common fire water storage tank located on the east side of the Fuel Handling Building as shown on Figure 6.5-1.

Reports reviewed as part of this HSA also indicate that the tanks have asbestos containing materials (ACM) coating and lead-based paint.

Potential source area and migration pathway to impact soils, sediments, surface water or groundwater

Spills, leaks, equipment failure and overflows of tanks and/or sumps may have resulted in releases of potential COCs to the ground.

Potential COCs include Title 22 metals, boron and ACM.

Data Gaps

Evaluate soil and groundwater beneath and adjacent to the tanks for the COCs listed above to confirm/deny potential significant releases to environmental media.

6.5.6 **Boron Spill Area and 115' RCA Yard**

During personnel interviews, it was revealed that there was a boron spill on the east side of the Fuel Handling Building in the 115' RCA yard area (AOC 5-6). Impacts were found in the water sample collected from French drain well, DY1. The solidification pad and underground drain lines associated with the rad waste and the laundry facilities are also present within this AOC. Several spill reports were encountered for this area during the HSA file review.

Potential source area and migration pathway to impact soils, sediments, surface water or groundwater

There have been several documented spills within this AOC. As noted in Section 5.5.2 above, the pavement in this area is in poor condition with numerous cracks. Releases to the ground likely resulted in the migration of COCs through cracks, impacting soils and groundwater. Underground lines may have also leaked, potentially impacting adjacent soils and groundwater. Additionally, stormwater runoff from this area may have mobilized COCs to drainage sumps potentially impacting sediments at the point of discharge to Diablo Creek.

Potential COCs for this AOC include VOCs, SVOCs (PAHs), TPH, boron and Title 22 metals.

Data Gaps

Evaluate soil and groundwater the COCs noted above to confirm/deny potential significant releases to environmental media.

6.5.7 Hazardous Waste Storage & Handling Area

The hazardous waste storage and handling area (AOC 5-7) is located adjacent to the Auxiliary Boiler Enclosure on the north side of the Fuel Handing Building within the NPA.

Potential source area and migration pathway to impact soils, sediments, surface water or groundwater

Releases of COC may have occurred in this AOC as a result of spills, leaking containers, overfills, etc. Releases may have migrated through the concrete containment pad via cracks or penetrations, potentially impacting sub-slab soils and groundwater.

Potential COCs for this AOC include VOCs, SVOCs, TPH and Title 22 metals.

Data Gaps

Evaluate soil and groundwater for the COCs noted above to confirm/deny potential significant releases to environmental media.

6.5.8 Laundry and Rad Waste Building (No. 117A/B/C)

The Radwaste, Laundry, and RAM Storage Buildings (Buildings 117A, 117B and 117C) (AOC 5-8) are in the southern portion of the 115-foot RCA as shown on Figure 6.5-1. As discussed in Section 5.5.2, the Radwaste Building is used for preparing, packaging, and storage of radioactive waste.

The Laundry Building contains the protective clothing washers and dryers. Reportedly only Freon was used for laundry operations. The area also includes facilities for the decontamination of tools and equipment.

The RAM Storage Building is used for the storage of contaminated tools and equipment for use in the RCA.

Potential source area and migration pathway to impact soils, sediments, surface water or groundwater

Releases of COCs may have occurred in this AOC as a result of spills, leaking containers or drain lines, overfills, etc. Releases may have migrated to sub-slab soil through cracks or penetrations or leaking underground lines.

Potential COCs for this AOC include VOCs, Freon, SVOCs, and TPH.

Data Gaps

Evaluate soil and groundwater for the COCs noted above to confirm/deny potential significant releases to environmental media.

6.5.9 Warehouse A and Adjacent Areas

Warehouse A (Building No. 519) and the adjacent Paint Department Building (No. 520) and Start Up Building (No. 527) (AOC 5-9) have been or are currently used to store various chemicals and paints.

Potential source area and migration pathway to impact soils, sediments, surface water or groundwater

Releases of COC may have occurred in this AOC as a result of spills, leaking containers, overfills, or faulty equipment. Releases may have migrated to sub-slab soil through cracks or penetrations in the building floors.

Potential COCs for this AOC include VOCs, SVOCs, TPH and Title 22 metals.

Data Gaps

Evaluate soil and groundwater the COCs noted above to confirm/deny potential significant releases to environmental media.

6.5.10 Auxiliary Boiler Enclosure

The auxiliary boiler (AOC 5-10) is located in a building (No. 118) at the north end of the Fuel Handing Building as shown on Figure 6.5-1.

Potential source area and migration pathway to impact soils, sediments, surface water or groundwater

Boiler blowdowns or chemical releases to the floor slab within the building could migrate to sub-slab soils via floor penetrations and cracks.

Potential COCs for this AOC include TPH and Title 22 Metals.

6.6 SPA – AREAS OF CONCERN

Five AOCs have been identified in the SPA as shown on Figure 6.6-1 and described below.

6.6.1 Main Warehouse

Chemicals such as hydrazine are stored in the south end of the Main Warehouse (AOC 6-1). Chemical containers are stored on containment pallets. Any significant releases to the warehouse floor would drain to sumps that would then be cleaned up and disposed of by the hazardous waste group.

Potential source area and migration pathway to impact soils, sediments, surface water or groundwater

Chemicals are delivered to, unloaded and stored in the Main Warehouse. Any spills outside the warehouse as part of the delivery off-loading process could impact soils beneath the asphalt paving. Releases to the floor slab within the building could migrate to sub-slab soils via floor penetrations and cracks.

Potential COCs for this AOC include VOCs, SVOCs, TPH and Title 22 Metals.

Data Gaps

Evaluate soil in the delivery/unloading area on the south end of the warehouse for the COCs as listed above. If soil samples indicate COCs above applicable standards, then groundwater samples should be collected for the corresponding analytes of concern. At the time of building demolition, sub-slab soil should be evaluated for evidence of a release. If staining and/or odors are observed, soil samples should be collected and submitted for analysis of COCs.

6.6.2 Liquid Storage Building (No. 127)

Liquid chemicals including paints, resins, solvents, carbohydrazide, lithium hydroxide, sodium hydroxide, etc. are stored in Building No. 127 (AOC 6-2).

Potential source area and migration pathway to impact soils, sediments, surface water or groundwater

Releases to the floor slab within the building could migrate to sub-slab soils via floor penetrations and cracks.

Potential COCs for this AOC include VOCs, SVOCs, TPH and Title 22 Metals.

Data Gaps

Evaluate sub-slab soil for the COCs listed above to confirm/deny potential significant releases to environmental media.

6.6.3 Cold Machine Shop & Former UST

The Cold Machine Shop (AOC 6-3) is primarily used for repair and maintenance of mechanical components on site. Solvents, oils, lubricants and other chemicals were used and stored within this facility. A former UST was located on the north side of the building (No. 116). The UST was removed in late 2003 and clean closed in accordance with the approved Facility Closure Plan. Soil samples collected from the UST grave were analyzed for metals. Results were below the Title 22 TTLC.

Potential source area and migration pathway to impact soils, sediments, surface water or groundwater

Releases to the floor slab within the building could migrate to sub-slab soils via floor penetrations and cracks.

Potential COCs for this AOC include VOCs, SVOCs, Title 22 metals, and TPH.

Data Gaps

Sub-slab soil samples should be collected for the analytes listed above to confirm/deny potential significant releases to environmental media. If soil samples indicate COCs above applicable standards, then groundwater samples should be collected for the corresponding analytes of concern.

6.6.4 Paint Department and Laydown Area

The Paint Department and associated laydown area (AOC 6-4) as shown on Figure 6.6-1, was used for the storage and application of paints. According to Action Reports encountered and interviews conducted as part of this HSA, housekeeping and proper chemical/paint storage was an on-going issue of concern in this area.

Potential source area and migration pathway to impact soils, sediments, surface water or groundwater

COCs may have been released to the ground through spills, overfills, or leaky/damaged containers. Potentially contaminated material includes shallow soils.

Potential COCs for this AOC include VOCs, SVOCs, Title 22 metals, and TPH.

Data Gaps

Shallow soil samples should be collected for the analytes listed above to confirm/deny potential significant releases to environmental media. If soil samples indicate COCs above applicable standards, then groundwater samples should be collected for the corresponding analytes of concern.

6.6.5 Temporary Parking Area

There are several temporary parking lots (AOCs 1-2-1 through 1-2-3) located within the NOCA. In addition to parking, these areas are used for temporary storage and equipment staging. Most of these areas are not paved.

Potential source area and migration pathway to impact soils, sediments, surface water or groundwater

COCs may have been released to the ground through equipment failure, spills, overfills, or leaks. Potentially contaminated material includes shallow soils, surface water and sediments.

Potential COCs for this AOC include VOCs, SVOCs, Title 22 metals, and TPH.

Data Gaps

Soil and sediment samples should be collected for the analytes listed above to confirm/deny potential significant releases to environmental media.

6.7 PBA - AREAS OF CONCERN

Five AOCs have been identified in the PBA as shown on Figure 6.7-1 and described below.

6.7.1 Oil Water Separator

An oil water separator collection sump (AOC7-1) is located in the northeast corner of the Turbine Building near Unit 1 Containment.

Potential source area and migration pathway to impact soils, sediments, surface water or groundwater

The sump receives potentially impacted fluids from spills, leaks overfills and/or equipment failure(s). COCs could potentially infiltrate cracks in the floor or concrete sump or leak from piping connections/fittings contaminating surrounding soil and potentially groundwater.

Potential COCs for this AOC include VOCs, SVOCs, Title 22 metals, and TPH.

Data Gaps

Soil and sump sludge/sediment samples should be collected and analyzed for the COCs listed above to confirm/deny potential significant releases to environmental media. If soil or sediment samples indicate COCs above applicable standards, then surface water and groundwater samples should be collected for the corresponding analytes of concern.

6.7.2 Underground Piping

Floor drains and underground piping (AOC 7-2) are present throughout the PBA buildings.

Potential source area and migration pathway to impact soils, sediments, surface water or groundwater

Underground pipes containing COCs may have leaked via connections or fittings or are no longer competent and may have contaminated surrounding soil and potentially groundwater.

Potential COCs for this AOC include VOCs, SVOCs, Title 22 metals, and TPH.

Data Gaps

Soil and groundwater samples should be collected and analyzed for the COCs listed above to confirm/deny potential significant releases to environmental media. Samples may also be collected from sumps to identify if materials within the pipes to support waste disposal. Soil gas samples may be collected if there is not access to the pipe bedding, or below building floors.

6.7.3 Underground Sumps

Underground sumps (AOC 7-3) are located throughout the PBA buildings to collect spills, wastewater, and liquids released as part of any equipment failures. Reportedly the emergency generators contained chromated water that was released within the building, collecting in the sumps.

Potential source area and migration pathway to impact soils, sediments, surface water or groundwater

COCs could potentially migrate through cracks or penetrations in the sump and impact surrounding soil and groundwater. Additionally, any sediment or sludge present within the sumps could be contaminated.

Potential COCs for this AOC include VOCs, SVOCs, PCBs, Title 22 metals, and TPH.

Data Gaps

Surrounding soils and groundwater and sediment within the sumps should be collected and analyzed for the COCs listed above to confirm/deny potential significant releases to environmental media.

6.7.4 Resin System Sumps

The resin system sumps (AOC 7-4) are located within the Turbine Building Buttresses for each Unit as shown on Figure 6.4-1.

Potential source area and migration pathway to impact soils, sediments, surface water or groundwater

COCs could potentially migrate through cracks or penetrations in the sump and impact surrounding soil and groundwater. Additionally, any sediment or sludge present within the sumps could be contaminated.

Potential COCs for this AOC include VOCs, SVOCs, PCBs, Title 22 metals, and TPH.

Data Gaps

Surrounding soil and groundwater and sediment within the sumps should be collected and analyzed for the COCs listed above to confirm/deny potential significant releases to environmental media.

6.7.5 Inground Turbine Oil Collection Structures

Inground turbine oil collection structures (AOC 7-5) are located in the center of the Turbine Building as shown on Figure 6.7-1. These structures are designed to capture and contain oil released from the turbine unit.

Potential source area and migration pathway to impact soils, sediments, surface water or groundwater

COCs may have accumulated in these inground structures over time of operation. COCs could potentially migrate through cracks or penetrations in structures impact surrounding soil and groundwater. Additionally, any sediment or sludge present within the structures could be contaminated. Based on personnel interviews, it is not believed that these structures are ever inspected.

Potential COCs for this AOC include VOCs, SVOCs, PCBs, Title 22 metals, and TPH.

Data Gaps

Surrounding soil and groundwater and sediment within the structures should be collected and analyzed for the COCs listed above to confirm/deny potential significant releases to environmental media.

6.8 SITE WIDE AREAS OF CONCERN

Three AOCs were identified as being a site wide concern as shown on Figure 6.8-1 and discussed below.

6.8.1 Groundwater

In addition to each of the individual AOCs, groundwater below the entire site (AOC 8-1) should be assessed. Currently there are a total of seven wells (OW1, OW2, DY1, 8S3, WW2, GW1 and GW2) that are monitored as part of the groundwater initiative however; only three of these wells (GW1, GW2 and

8S3) are true groundwater monitoring wells. OW1, OW2 and DY1 are French drain wells located within the PBA. The wells have been sampled for radiological constituents but have not been sampled for chemical COCs. Well locations are shown on Figure 6.8-1.

As discussed in Section 5.5.5, groundwater data and records reviewed during this HSA document the presence of radioactive material in site groundwater and boron in groundwater as discussed in Section 6.5.6.

Potential source area and migration pathway to impact soils, sediments, surface water or groundwater

As discussed in the other AOCs, releases of COCs to the environment may have impacted site groundwater quality through leaching and infiltration.

Data Gaps

In addition to the data gaps identified at the individual AOCs, the existing well network isn't sufficient to characterize the groundwater quality for the Site. Additional piezometers or monitoring wells are needed to better understand the overburden and bedrock water bearing zones/aquifers as well as understanding groundwater flow directions, velocity and flux of site-related COCs (if present). Groundwater should be analyzed for additional parameters including VOCs, SVOCs, TPH, PCBs and Title 22 metals.

6.8.2 Transformers

There are at least 25 active transformers at the site located outside the switchyards and the Unit 1 and Unit 2 transformer yards. Locations are shown on Figure 6.8-1. However, it should be noted that the number of transformers were based on a visual inventory, and others may exist on site. If present, they will be evaluated in a similar fashion.

Based on observations, the transformers are located on concrete pads with no observed secondary containment. The transformers within the Unit 1 and Unit 2 Switchyards are discussed in Sections 6.5.3 and 6.5.4 above.

Because of their dielectric and thermal conductivity properties, oils containing PCBs were commonly used in transformers. Their use was banned in 1979 due to their environmental toxicity and persistence. All transformers at DCPP now contain non-PCB oil (i.e. less than 500 ppm PCBs), but because the plant was constructed before 1979, residual PCBs may still be detectable in these oils and could therefore be release to the environment.

Potential chemicals of concern in AOC 8.2 include PCBs and PAHs from the transformer oils.

Potential source area and migration pathway to impact soils, sediments, surface water or groundwater

Potentially contaminated media include:

- Soil below the valves and in the general areas (if there were past failures that caused spray); and
- Groundwater, where leaks could migrate through the vadose zone and reach the water table. It should be noted that PCBs are not readily mobile and have a high ability to sorb to soil particles.

However, if solvents or surfactants were used as cleaning products around the transformers, they may further mobilize the PCBs to the water table.

Data Gaps

Soils in, around, or below each transformer and downgradient groundwater should be evaluated for PCBs and PAHs. If soil samples indicate COCs above applicable standards, then groundwater samples should be collected for the corresponding analytes of concern. IF fires are associated with any transformers, then dioxins will also be evaluated.

6.8.3 Surface Water and Stormwater

Stormwater from the norther portion of the Site (including the NOCA, NPA and NSA) drains to Diablo Creek and stormwater from the southern portion of the site which includes the SSA, SOCA and WOCA.

DCPP has a NPDES discharge permit (No. CA0003751), which requires monitoring of plant influent and effluent. Discharge points monitored include those from yard drains and stormwater runoff. These locations are monitored semiannually for the constituents identified in the Industrial Stormwater Pollution Prevention Plan (SWPPP) permit requirements.

Potential source area and migration pathway to impact soils, sediments, surface water or groundwater

Although there have not been violations or exceedances of the NPDES permit requirements (excluding total dissolved solids), it is possible for non-radiological COCs to migrate via stormwater and be released at the outfalls, impacting shallow sediments. Potential COCs include VOCs, SVOCs, TPH and Title 22 metals.

Data Gaps

Sediments at the outfall locations may need to be evaluated for additional COCs as noted above.

6.8.4 Diablo Creek

Diablo Creek (AOC 8-4) flows through the north end of the site, from east to west, discharging to Diablo Cove (Figure 6.8-1). This creek receives stormwater runoff from several AOCs including the switchyards, vehicle maintenance facility, and NPA, located in the norther portion of the site as discussed in previous sections.

Potential source area and migration pathway to impact soils, sediments, surface water or groundwater

Several outfalls along Diablo Creek are monitored as part of the NPDES permit however; it is possible for non-radiological COCs to migrate via stormwater and be released at the outfalls, impacting shallow sediments. Potential COCs include VOCs, SVOCs, PCBs, TPH and Title 22 metals.

Data Gaps

Sediments at the outfall locations may need to be evaluated for additional COCs as noted above.

6.9 NSA - AREAS OF CONCERN

Five AOCs have been identified within the NSA as shown on Figure 6.9-1 and described below.

6.9.1 Archeological Site

The Archeological Site (AOC 9-1) is currently protected however; a portion of it was once used for abrasive sandblasting activities.

Potential source area and migration pathway to impact soils, sediments, surface water or groundwater

COCs such as metals may be transported from the sandblasting area via dust in the air and surface water runoff, potentially impacting surrounding soils, surface water and sediments.

Potential COCs for this AOC include Title 22 metals and TPH.

Data Gaps

Shallow soil samples should be collected for the analytes listed above to confirm/deny potential significant releases to environmental media. If soil samples indicate COCs above applicable standards, then sediment and groundwater samples should be collected for the corresponding analytes of concern.

6.9.2 Former Wastewater Pond, Associated Piping and Fire Training Area

The former wastewater pond (AOC 9-2) was constructed at the north end of the Site (Figure 6.9-1). According to plant personnel interviewed as part of this HSA, the ponds were never used to hold wastewater. Water discharged to the ponds was from "flushing out" the pipes/systems at the time of construction. The pond area has been RCRA clean closed and subsequently used as a fire training area. Based on interviews, propane and hay bales were used to start "live" fires and water was used to extinguish the flames. Reportedly, chemical fire suppressants (foams) were not used.

The area has since been filled with several feet of soil generated from the construction of the ISFSI and other site projects.

Potential source area and migration pathway to impact soils, sediments, surface water or groundwater

The primary migration is via stormwater runoff to Diablo Creek, potentially impacting the sediments and surface water, but there is also potential for COCs to impact the underlying soil via leaching and rainwater infiltration. Additionally, portions of the fill material brought to this area have an unknown origin.

Data Gaps

Evaluate soil and groundwater in this AOC for VOCs, SVOCs, TPH, PCB and Title 22 metals.

6.9.3 Water Well No. 1

Water Well No. 1 (AOC 9-3) is located in the NSA as shown on Figure 6.9-1. According to site personnel, this well, that once drew water from Diablo Creek, has been abandoned. Based on personnel interviews, the well was abandoned because it was pulling in natural oil, but no evidence has been found in the documentation reviewed as part of this HSA.

Potential source area and migration pathway to impact soils, sediments, surface water or groundwater

If this well has not been properly abandoned, it could act as a pathway for COCs that may be mobilized from AOCs within the NOCA (i.e. vehicle maintenance garage) via stormwater run-off.

Data Gaps

It should be verified that this well has been abandoned in accordance with California Department of Water Resources Water Codes.

6.9.4 Farmland

Farmlands are present to the north and east of the plant (AOC 9-4). These farmlands are currently leased to local farmers for cattle grazing. Typical farming practices include the use of pesticides, herbicides, arsenic, and fertilization to assist in crop production. It is unknown what chemicals or practices were used on the surrounding farmlands.

Potential source area and migration pathway to impact soils, sediments, surface water or groundwater

Due to the common practice of releasing small quantities of materials when fueling farm equipment, shallow soils and groundwater may be impacted by the diesel. Additional COCs could include VOCs, SVOCs, metals as well as pesticides.

Data Gaps

Soil and groundwater in the farmlands may need to be evaluated for TPH, herbicides, pesticides, and arsenic.

6.9.5 GC Electrical Yard

Electrical equipment, including some that may have contained PCB oils, have been stored in the gravel covered GC Electrical Yard (AOC 9-5). Additionally, chemicals such as oils, paints, paint thinners etc. have been stored and used in this area.

Potential source area and migration pathway to impact soils, sediments, surface water or groundwater

Spills, overfills and leaks from containers or equipment could impact underlying soils with COCs. COCs released to the soil could be mobilized with stormwater runoff potentially impacting sediments in Diablo Creek.

Data Gaps

Soil in this area should be evaluated for VOCs, SVOCs, PCBs, TPH and Title 22 Metals. Sediment along the stormwater drainage from this area shall also be evaluated for the COCs listed.

6.10 SSA - AREAS OF CONCERN

Four AOCs were identified in the SSA as shown on Figure 6.10-1 and discussed below.

6.10.1 Leaching Field

A leach field (AOC 10-1) was constructed on the hillside in the SSA (Figure 6.10-0). The intent was to truck the solid sanitary waste up to the field for application. According to employees interviewed as part of this HSA, the leach field was only used once before it was decided to truck the waste off-site for disposal instead.

Potential source area and migration pathway to impact soils, sediments, surface water or groundwater

If COCs were released to the sanitary system, they may have been applied to the leach field, potentially impacting shallow soil.

Data Gaps

Shallow soil in this area should be evaluated for inorganics/nutrients, Title 22 Metals and TPH.

6.10.2 Various Satellite Target Areas

The hillside and remote ranges (AOC 10-2) were used for target practice. In 2007 soil samples were collected from these areas and analyzed for select total metals. Elevated concentrations of lead were observed. As described in Section 6.2.3, in 2009, additional soil samples were collected from these target areas as part of the Multi-Media Sampling and Analysis of the shooting range. Samples were analyzed for total and TCLP metals. No exceedances of the screening criteria were observed.

Potential source area and migration pathway to impact soils, sediments, surface water or groundwater

Potentially contaminated media include lead and other metal impacts in the sand traps (and surrounding soils). Additionally, the nearby sediments and surface waters could also be impacted via stormwater runoff.

Data Gaps

Soil in the hillside behind the ranges should be evaluated for metals including lead. If soil samples indicate COCs above applicable standards, then groundwater samples should be collected for the corresponding analytes of concern.

6.10.3 Bioremediation Area

An area of land located within the SSA (AOC 10-3) was reportedly used for bioremediation of diesel fuel-impacted soils as the result of a fuel oil spill at the vehicle maintenance shop. Reportedly the impacted soil was eventually loaded and transported off site for reuse as landfill cover once acceptable concentrations were achieved.

Potential source area and migration pathway to impact soils, sediments, surface water or groundwater

Shallow soils and groundwater may have been impacted by the diesel leaching from the impacted soil.

Data Gaps

Soil and groundwater in this area should be evaluated for TPH, PAHs, and metals to determine if significant impacts to environmental media are present.

6.10.4 Farmland

Farmlands are also present to the south and east of the plant are AOC 10-4. These farmlands are currently leased to local farmers for cattle grazing. As discussed in Section 6.9.4, typical farming practices include the use of pesticides, herbicides, arsenic, and fertilization to assist in crop production. Although the land is currently used as cattle pasture, it is unknown what chemicals or practices were used on the surrounding farmlands.

Potential source area and migration pathway to impact soils, sediments, surface water or groundwater

Shallow soils may be impacted by residual pesticides, herbicides, fertilizer and arsenic that may have been historically applied to assist in crop production.

Data Gaps

Soil and groundwater in the farmlands may need to be evaluated for TPH, herbicides, pesticides, and arsenic.

SECTION 7 SITE RADIOLOGICAL STATUS

7.1 RADIOLOGICAL CONCLUSIONS

Table 7.1-1 summarizes the radiological conclusion reached based on information obtained during this HSA.

Table 7.1-1. Radiological Conclusion Summary

Study Area	Location within Area	Classification	Potential ROCs
NOCA	OSGSF	Impacted	H-3, Co-60, Cs-137, Cs-134, Sr-90, Ni-63, Fe-55, and Tc-99
	WHAT System Facility	Impacted	Co-60, Cs-134, Cs-137, H-3, Fe-55, Ni-63, Sr-90, and Tc-99
	Raw Water System, Switchyards, Secondary FLEX Storage Area, and Outbuildings	Non-Impacted	Not applicable
	Tri-Bar Flats Area, Scaffold Laydown, and Spoils Area	Impacted	Co-60, Cs-134, Cs-137, H-3, Fe-55, Ni-63, Sr-90, and Tc-99
	Open Land Areas	Impacted	Co-60, Cs-134, Cs-137, H-3, Fe-55, Ni-63, Sr-90, and Tc-99
SOCA	Parking Lot 1 and Vicinity	Impacted	H-3, C-14, Sr-90, Ni-63, Co-60, and Cs-137
	Warehouse B (Building 113):		
	• Interior RAM storage	Impacted	H-3, C-14, Sr-90, Ni-63, and Cs-137
	• Remaining interior	Non-Impacted	Not applicable
	• Exterior	Impacted	H-3, C-14, and Co-60
	Parking Lots 6,7,8, and Roadways	Impacted	H-3, C-14, Sr-90, Ni-63, Co-60, and Cs-137
	Unpaved Open Land Areas	Impacted	H-3, C-14, and Co-60

Study Area	Location within Area	Classification	Potential ROCs
WOCA	Area 10 – Parking Lot 3	Impacted	H-3, C-14, Sr-90, Ni-63, Co-60, and Cs-137
	NPG Learning/ Maintenance Shop Building:		
	• Rooms 123 & 239	Impacted	Check Sources: Eu-152, Eu-154, Cs-137, Co-60, Ba-133, Sr/Y-90, H-3, C-14, and Th-230
	• Remaining interior • Building exterior	Non-Impacted	Not applicable
	Parking Lots 2, 4a, 4b, and 5	Impacted	H-3, C-14, and Co-60
		Impacted	H-3, C-14, and Co-60
	Intake Area		
	Diablo Canyon Creek Area	Impacted	H-3, C-14, and Co-60
		Impacted	H-3, C-14, Sr-90, Ni-63, Co-60, and Cs-137
DCA	U1 & U2 Discharge Structure	Impacted	Co-60, Sb-125, Cs-134, Cs-137, H-3, C-14, and Sr-90
NPA	Warehouse A	Impacted	Co-60, Cs-134, Cs-137, H-3, Fe-55, Ni-63, Sr-90, and Tc-99
	115-ft Elevation RCA	Impacted	Co-60, Cs-134, Cs-137, H-3, Fe-55, Ni-63, Sr-90, and Tc-99
	Pavement Areas	Impacted	Co-60, Cs-134, Cs-137, H-3, Fe-55, Ni-63, Sr-90, and Tc-99
	Unit 1 & 2 Condensate Polishing System Sumps	Impacted	Co-60, Cs-134, Cs-137, H-3, Fe-55, Ni-63, Sr-90, and Tc-99
	Groundwater Monitoring Wells	Impacted	H-3

Study Area	Location within Area	Classification	Potential ROCs
SPA	Administration, Security, Liquid Storage, and Temporary Office Buildings	Impacted	H-3, C-14, and Co-60
	DCPP Main Warehouse	Impacted	H-3, C-14, and Co-60
	Cold Machine Shop	Impacted	Co-60, Cs-134, Cs-137, H-3, Fe-55, Ni-63, Sr-90, and Tc-99
	Open Land Areas	Impacted	Co-60, Cs-134, Cs-137, H-3, Fe-55, Ni-63, Sr-90, and Tc-99
PBA	Unit 1 and 2 Containment Buildings	Impacted	Interior surfaces of systems, components, and sumps: H-3, C-14, Mn-54, Fe-55, Co-60, Ni-59, Ni-63, Sr-90, Nb-94, Tc-99, Cs-134, Cs-137, Eu-152, Pu-238, Pu-239/240, Am-241, Pu-241, Cm-242, Cm-243/244. External surfaces of primary systems and components: C-14, Fe-55, Mn-54, Co-60, Ni-63, Sb-125, Cs-134, and Cs-137. Activated concrete: above ROCs plus Eu-152, Eu-154, and Eu-155
	Units 1 and 2 Fuel Handling Buildings	Impacted	Highly contaminated structures and components: H-3, C-14, Cr-51, Fe-55, Mn-54, Co-57, Co-58, Co-60, Ni-59, Ni-63, Zn-65, Sr-89, and Sr-90. Low-to-moderately contaminated structures and components: Fe-55, Mn-54, Co-57, Co-58, Co-60, Ni-59, Ni-63, and Zn-65.
	Auxiliary Building	Impacted	Most surfaces: H-3, C-14, Fe-55, Mn-54, Co-60, Ni-63, Sb-125, Cs-134, and Cs-137. Interior surfaces of pipes, tanks, and sumps: H-3, C-14, Mn-54, Fe-55, Co-60, Ni-59, Ni-63, Sr-90, Nb-94, Tc-99, Cs-134, Cs-137, Eu-152, Pu-238, Pu-239/240, Am-241, Pu-241, Cm-242, Cm-243, and Cm-244.
	Turbine Building	Impacted	H-3, C-14

7.2 RADIOLOGICAL DATA GAP SUMMARY

Table 7.2-1 summarizes the conclusions regarding the radiological impact and classifications for environmental areas at the DCPP site.

Table 7.2-1. Data Gap by Area Summary

Study Area	Location within Area	Data Gap(s)
NOCA	OSGSF	H-3 concentration in concrete Radiation survey of facility floor (reactor head storage locations) Radiation surveys in outer adjacent area (used for RAM storage) Radiation surveys & sample data for heavy haul route Sample data from drainage point to Diablo Canyon Creek
	WHAT System Facility	Radiation survey data Concrete sample analyses Sediment analyses Soil analyses
	Tri-Bar Flats Area, Scaffold Laydown, and Spoils Area	Radiation surveys for Scaffold Laydown pad Radiation surveys for the Tri-Bar Flats and Spoils Areas Surface soil/sediment sample analyses Sub-surface soil sample analyses for the Spoils Area
	Open Land Areas	Radiation survey data Analyses for concrete, soil, and sediment
SOCA	Parking Lot 1 and Vicinity	Radiological surveys of as-left conditions for temporary RMA locations Analytical data for soil samples from unpaved open land areas in the vicinity of Lot 1 Analytical data for asphalt and underlying soil samples from Lot 1 Analytical data for asphalt and underlying soil samples from the turnout area
	Warehouse B (Building 113): Interior RAM storage;	"As-left" radiation survey data Analytical data for samples from the concrete pad.
	Parking Lots 6,7,8, and Roadways	Radiation surveys for "as left" conditions Analytical data for soil samples Analytical data for asphalt samples Analytical data for concrete samples
	Unpaved Open Land Areas	Analytical data for soil and gravel/sand samples

Study Area	Location within Area	Data Gap(s)
WOCA	Area 10 – Parking Lot 3	"As-left" radiological conditions in the Hazardous Waste Facility Analytical data for concrete Analytical data for soil
	NPG Learning/ Maintenance Shop Building (119): Rooms 123 & 239;	Radiation survey for post-removal of check sources
	Parking Lots 2, 4a, 4b, and 5	Analytical data for concrete, asphalt, and soil
	Intake Area	Concrete sample analyses Asphalt and underlying soil sample analyses
	Diablo Canyon Creek Area	Sediment from the bed of Diablo Canyon Creek Soil adjacent to Diablo Canyon Creek
DCA	U1 & U2 Discharge Structure and mouth of Diablo Canyon Creek	Sediment analyses for Diablo Canyon Creek bed Shoreline soil sample analyses
NPA	Warehouse A	Soil sample analyses (adjacent areas) A/C condensate analyses for H-3
	115-ft Elevation RCA	Radiation survey data Asphalt and concrete sample analyses Underlying soil sample analyses
	Pavement Areas	Radiation survey data Asphalt and concrete sample analyses Underlying soil sample analyses
	Unit 1 & 2 Condensate Polishing System Sumps	Radiation & contamination surveys of the sump structure Analyses of sump concrete for volumetric contamination Analyses of sump sludge/sediment

Study Area	Location within Area	Data Gap(s)
SPA	Administration, Security, Liquid Storage, and Temporary Office Buildings	Radiation survey data Asphalt samples Concrete samples Soil sample analyses
	DCPP Main Warehouse	Radiation survey data Concrete samples Soil sample analyses
	Cold Machine Shop	Radiation survey data Concrete samples Soil sample analyses
	Open Land Areas	Radiation survey data Soil sample analyses Sediment samples Asphalt samples Storm drain inspections and surveys
PBA	Unit 1 and 2 Containment Buildings	Radiological analyses for the crud layer within primary system piping and components Radiological analyses to determine extent of volumetric contamination for concrete Radiological surveys and sample analyses for containment sumps Radioactive contamination on exterior building surfaces
	Units 1 and 2 Fuel Handling Buildings	Radioactive contamination on exterior building surfaces Radiation and contamination conditions on surfaces in the fuel handling building that are not normally accessible. Radiation and contamination conditions of the transfer tube Radiological surveys of SFP and under spent fuel pool storage racks
	Auxiliary Building	Radiological surveys and sample analyses for the Radwaste Building sumps Sampling and analysis crud layers on internal surfaces of systems, tanks, pumps, and piping carrying radioactive liquids. Radioactive contamination on exterior building surfaces
	Turbine Building	Radioactive contamination on exterior building surfaces Radioactive contamination on interior concrete surfaces.

SECTION 8 SITE CHEMICAL (NON-RADIOLOGICAL) STATUS

8.1 CHEMICAL (NON-RADIOLOGICAL) CONCLUSIONS

This HSA identifies the potential areas where non-radiological contamination could have been released to the environment. This effort has been completed to support the upcoming decommissioning cost estimates and has also been coordinated to take advantage of similarities and collated areas, and so that data meet all data quality objectives and the requirements of all the regulatory agencies (i.e. NRC, DTSC, and CalEPA).

8.2 CHEMICAL DATA GAP SUMMARY

Each AOC identified in this HSA has the potential to release COCs to the environment. Table 8.2-1 lists the AOCs and COCs that will require additional characterization efforts to attain site closure with regulatory agencies.

Based on the data presented in this HSA, known and documented releases have occurred at the following AOCs, impacting environmental media, and will likely require remediation:

- AOC 2-3: Shooting Range
- AOC 5-1: Diesel USTs
- AOC 5-3: Unit 1 Transformer Yard
- AOC 5-4: Unit 2 Transformer Yard

The COCs and potentially impacted media for each AOCs are listed in Section 6.

In addition to potential impacts to soil, groundwater, sediments or surface water, building materials, (paints, coatings, caulking, insulation, gunnite, etc.) may contain non-radiological COCs that will require evaluation before demolition.

Table 8.2-1 Non-Radiological Constituents of Concern

			Potential Constituents of Concern (COCs)									
Study Area	**AOC No.**	**Description**	**VOCs**	**SVOCs/ PAHs**	**TPH**	**PCBs**	**Title 22 Metals**	**PFOAs**	**Pesticides Herbicides**	**Boron**	**Freon**	**Other (pH, Nitrates, etc.)**
NOCA	1-1	Vehicle Maintenance Shop (Bldg. No. 402) and "Man Camp" Area	√	√	√	√	√					
	1-2	Temporary Parking Areas	√	√	√		√					
	1-3	Sandblasting Area					√					
	1-4	500 kV Switchyard			√	√						
	1-5	230 kV Switchyard			√	√						
	1-6	WHAT Facility		√	√	√	√					
	1-7	Electrical Laydown Area	√	√	√	√	√					
	1-8	Tribar Flats	√	√	√	√	√					
	1-9	Biofouling Pile and Blind	√	√	√		√					
	1-10	Chlorination and Domestic Water Buildings										
	1-11	Polymetric Makeup Water System										√
	1-12	Raw Water Reservoirs	√	√			√					
	1-13	Old Steam Generator Storage Facility			√		√					
	1-14	Former Asphalt Batch Area		√	√							
SOCA	2-1	Parking Lots	√	√	√		√					
	2-2	Former Fire Department/Current Facility Maintenance	√	√	√		√	√				
	2-3	Shooting Range	√				√					
	2-4	Building 113 (Warehouse B)	√	√	√	√	√					
	2-5	Fuel Dispensing Area	√		√							
	2-6	Sandblasting Area			√		√					
	2-7	Miscellaneous Outbuildings and Concrete Batch Plant	√	√	√		√					
WOCA	3-1	Intake Maintenance Building and Maintenance Shop	√	√	√		√					
	3-2	Above ground Storage Tanks (Biofouling System)										√
	3-3	Parking Lots	√	√	√		√					
	3-4	Maintenance Building (No. 119), Annex and AST	√	√	√		√					
	3-5	Boat Slip			√		√					
	3-6	Hazardous Waste Storage Building (Building No. 120)	√	√	√	√	√					
	3-7	Sand Blasting and Spray Painting Facility	√	√	√		√					
	3-8	GC Fabrication shop	√	√	√		√					
	3-9	RO Operations										
	3-10	Turbine Generator Equipment Warehouse	√	√	√		√					
	3-11	Sewage Treatment Plant					√					
DCA	4-1	Diablo Cove Sediments and Shell Waste	√	√	√		√					

			Potential Constituents of Concern (COCs)									
Study Area	**AOC No.**	**Description**	**VOCs**	**SVOCs/ PAHs**	**TPH**	**PCBs**	**Title 22 Metals**	**PFOAs**	**Pesticides Herbicides**	**Boron**	**Freon**	**Other (pH, Nitrates, etc.)**
NPA	5-1	Former and Current Diesel USTs		√	√							
	5-2	ASTs Associated with Resin Polish System										
	5-3	Unit 1 Transformer Yard and OWS	√	√	√	√	√	√				
	5-4	Unit 2 Transformer Yard and OWS	√	√	√	√	√	√				
	5-5	Radiological Controlled Area -Tanks					√					
	5-6	Boron Spill Area	√	√	√		√			√		
	5-7	Hazardous Waste Storage and Handling Area	√	√	√		√					
	5-8	Laundry and Rad Waste Buildings (Nos. 117 A/B/C)	√	√	√		√				√	
	5-9	Warehouse A and Adjacent Areas	√	√	√		√					
	5-10	Auxiliary Boiler Enclosure			√		√					
SPA	6-1	Main Warehouse	√	√	√		√					
	6-2	Liquid Storage (Building No. 127)	√	√	√		√					
	6-3	Cold Machine Shop and Former UST	√	√	√		√					
	6-4	Paint Department and Laydown Area	√	√	√		√					
	6-5	Temporary Parking Area	√	√	√		√					
PBA	7-1	Oil Water Separator	√	√	√		√					
	7-2	Underground Piping	√	√	√		√					
	7-3	Underground Sumps	√	√	√	√	√					
	7-4	Resin Systems Sumps	√	√	√	√	√					
	7-5	Inground Turbine Oil Collection Structures	√	√	√	√	√					
Site Wide	8-1	Groundwater	√	√	√	√	√					
	8-2	Transformers		√		√						
	8-3	Surface water/Stormwater	√	√	√		√					
	8-4	Diablo Creek	√	√	√	√	√					
NSA	9-1	Archeological Site			√		√					
	9-2	Former Wastewater Pond, Associated Piping and Fire Training Area	√	√	√	√	√					
	9-3	Water Well No. 1										
	9-4	Farmland			√		√		√			
	9-5	GC Electrical Yard	√	√	√	√	√					
SSA	10-1	Leaching Field			√		√					
	10-2	Various Satellite Target Areas					√					
	10-3	Bioremediation Area		√	√							
	10-4	Farmland			√		√		√			

Notes:

VOCs: Volatile Organic Compounds
SVOCs: Semi-volatile Organic Compounds
TPH: Total Petroleum Hydrocarbons
PCBs: Polychlorinated Biphenyls
Title 22 Metals: Resource Conservation and Recovery Act Metals
PFOAs: Perfluorooctanoic Acid

SECTION 9 REFERENCES

1. NUREG-1575, *Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)*, Revision 1, August 2000
2. Chapter 1, *Introduction and General Plant Description*, DCPP Units 1 and 2 FSAR Update, Revision 23, December 2016
3. Chapter 2, *Site Characteristics*, DCPP Units 1 and 2 FSAR Update, Revision 23, December 2016
4. Document DCPP-TA-012, *Diablo Canyon Decommissioning Site Characterization Study,* (Conceptual Revision) 2/2018
5. DTSC, *Closure Certification, Pacific Gas and Electric Company (PG&E), Diablo Canyon Power Plant, San Luis Obispo County*, EPA ID # CAD 077 966 349, 6 December 1995.
6. Entrix. Groundwater Gradient Analysis, Diablo Canyon Power Plan, San Luis Obispo, California. March 2010.
7. Jacobson/James and Associates, Inc., *Multi-Media Sampling and Analysis Data Deliverable, Diablo Canyon Power Plant Active Firing Range*, 21 December 2009.
8. PG&E, *Certification of Closure Wastewater Holding and Treatment (WHAT) Facility*, 7 September 2009.

SECTION 10 APPENDICES

APPENDIX A: LIST OF DOCUMENTS REVIEWED

Document ID	Document Type	Document Title	Study Area Affected
50354539	Notification	GPI - OSGSF - Contamination Cleanup Plan	NOCA
ISFSI UFSAR R6	FSAR	Diablo Canyon ISFSI FSAR Update	SOCA, NOCA, NPA
ISFSI License SNM-2511	NRC License	License for Independent Storage of Spent Nuclear Fuel and High-Level Radioactive Waste	NOCA
A0083916	Action Request	Contamination of Solidification Lines	NPA
A0549814	Action Request	Spread of Contamination on Solidification Pad	NPA
A0550674	Action Request	Contamination of the Rad Waste Processing Pad (AKA The Back Yard)	NPA
A0612490	Action Request	Spill of Radioactive Material Outside of an SCA 6/15/2004	NPA
A0660113	Action Request	Vacuum Hose Failed during Radwaste Media Cleanup	PBA
50044764	Notification	Spill of Radioactive Material Outside of a Contaminated Area	NPA
50238381	Notification	Establish an RMA to Support RRVCH Project	SOCA
50271408	Notification	Guidelines to Establish RCA at OSGSF	SOCA, NOCA
50304131	Notification	Establish RMA Outside the Normal RCA	NOCA
50308441	Notification	Establish Temp. RMA, Northwest Corner of Parking Lot 1	NOCA
50320216	Notification	Temporary Storage of Radioactive Material, Warehouse B	SOCA
50688312	Notification	Establish Temporary RMA to Support Movement of HI-TRAC	SOCA, NOCA
1R16 post decon 12893	RP survey	Remediated Area at OSG where Old U-1 Rx Head Leaked	NOCA
1R16 U1 Rx Hd path 12816	RP Survey	Survey OSG Area for Possible Contamination and Post Install of Head Radiation Survey of Outside Area	NOCA
93-8038	RP Survey	Investigate Contamination Found O/S RCA at Bldg Storm Drain	PBA
93-8044	RP Survey	Contamination Investigation	PBA
93-8083	RP Survey	Identify Contamination	PBA
A0315621	Action Request	Surface Contamination on the 115' Yard Outside an SCA	NPA
A0364616	Action Request	Spill during ISOLOK Sampling	NPA

Document ID	Document Type	Document Title	Study Area Affected
1R16 OSGSF Goldhaufer 12735	RP Survey	Move ORCVH to Storage Building	NOCA, NPA
50308622	Notification	Rollover of A0320718 for 10CFR50.75g	NPS
50355971	Notification	GPI- OSGSF Contamination Clean-up Plan	NOCA
50311564	Notification	RRVCH - Establish Temp RMA, OSGSF South	SOCA, NOCA
50354864	Notification	Primary Water Leakage	NOCA
50371924	Notification	OSGSF Rain Intrusion/Building Leakage	NOCA
50480116	Notification	Evaluate U 1 Containment Recirc. Sump Crack for G P I	PBA
A0713049	Action Request	Evaluate Storage of Material on the Radwaste Building Roof	NPA
2012 AREOR Final.PDF PG&E Letter DCL-13-029	Annual Report	2012 Annual Radiological Environmental Operating Report Diablo Canyon Power Plant January 1, 2012 - December 31, 2012	SOCA
2013 AREOR Final.PDF PG&E Letter DCL-14-032	Annual Report	2013 Annual Radiological Environmental Operating Report Diablo Canyon Power Plant January 1, 2013 - December 31, 2013	SOCA
2014 AREOR Final.PDF PG&E Letter DCL-15-046	Annual Report	2014 Annual Radiological Environmental Operating Report Diablo Canyon Power Plant January 1, 2014 - December 31, 2014	Site-wide
2015 AREOR Final.PDF PG&E Letter DCL-16-045	Annual Report	2015 Annual Radiological Environmental Operating Report Diablo Canyon Power Plant January 1, 2015 - December 31, 2015	Site-wide
2016 AREOR Final.PDF PG&E Letter DCL-17-030	Annual Report	2016 Annual Radiological Environmental Operating Report Diablo Canyon Power Plant January 1, 2016 - December 31, 2016	Site-wide
A0320718	Action Request	Rollover of A0320718 for 10CFR50.75g Contamination Found Outside RCA 85'BY 02 Boiler & U1 Well Rm	NPA
A0378350	Action Request	Evaluation for RMA Outside Normal RCA	SPA
A0381849	Action Request	Westinghouse Sludge Lance Trailers	NPA
A0620358	Action Request	Temporary RCA/RA/RMA	NOCA
A0671649	Action Request	Radioactivity Discovered under Containment Structures	NPA
A0673112	Action Request	Groundwater Elevated Isotopic Results from Drywell 115'	NPA

Document ID	Document Type	Document Title	Study Area Affected
A0674479	Action Request	10CFR50.75(G) Repository AR - Groundwater Issues	NPA
A0722419	Action Request	REMP Station DY1 (DRYWELL 115) Tritium > 20,000 PCI/L	NPA
50043118	Notification	Temporary RAM Storage Vans of Material from the OSGSF	NOCA
RP Survey 16-12816	RP survey	Survey OSG Area for Possible Contamination and Post Install of Head Radiation Survey of Outside Area	NOCA
50032906 - Task 3	Notification	Place Area TLDs at Main Warehouse RMAs	SPA
50032906 - Task 4	Notification	Area TLDs for S/G Chemical Cleaning Tank Farm 1R12	NPA
50032906 - Task 9	Notification	Temporary RCA for RAM Shipment Trailer at Raw Water Ponds	NOCA
50032906 - Task 18	Notification	RCP Rotor Storage (A0677146)	WOCA
50032906 - Task 24	Notification	Created from A0709399, Storage of Scaffolding RAM Seavans	NOCA
50032906 - Task 27	Notification	Reconfiguration and Use of Warehouse “A” During SGRO	PBA
50032906 - Task 28	Notification	Storage of Radiography Sources at Warehouse “B” for SGRO	SOCA
50032906 - Task 31	Notification	Store RAM Outside the North Gate of the RCA for 2R14	PBA
50032906 - Task 37	Notification	Temporary RAM Storage for Shipments Across from LOT 1	SOCA
50032906 - Task 39	Notification	RAM Storage Around the External OSGSF Bldg Between SGROs	NOCA
50032906 - Task 48	Notification	50238381 RMA Lot 1 to Support 2R15	SOCA
50032906 - Task 49	Notification	50238441 RMA Crane Bay	PBA
50191250	Notification	Drywell Tritium Event in 2008	NPA
50195082	Notification	Rollover of A0315621 for 10CFR50.75g	NPA
50275027	Notification	Gaps Found at 91 ft Elevation at Floor/Liner Plate	PBA
50286827	Notification	Water Found in OSGSF Vault 30 Sump	NOCA
50384315	Notification	REMP DY1 10CFR50.75g	PBA
50912865	Notification	Decom 50.75g RCA 115’ Dirt	NPA
50314152	Notification	QDEF - Outdoor RAM Storage	NPA
50262461	Notification	Unit 1 Buttress Chemistry Lab Vent Hood – Potential Contamination	PBA
50337844	Notification	Request to Establish Temporary RMA at the VIS	SPA

Document ID	Document Type	Document Title	Study Area Affected
50483852	Notification	U1 CST Water Draining to 115' Elev Yard	NPA
A0127540	Action Request	Radioactive Liquid Spill	PBA
A0507185	Action Request	Soil Erosion at Site East Perimeter Fence	SOCA
A0554958	Action Request	Inadvertent Spill and Dose Increase in 100' AUX, U-1	PBA
A0554960	Action Request	Spill and High Dose Rates with Pre-resin Transfer Activities	PBA
A0568568	Action Request	U2 SFS Leakage	PBA
ESP Survey 53065 AWS Pothole Sample.pdf	RP Survey	ASW Piping Ground Excavation Samples	WOCA
ESP53065	RP Survey	ASW Piping Ground Excavation Samples	WOCA
A0014687	Action Request	Turbine Building Sump Discharged to Outfall	NPA
A0050674	Action Request	Track Spill of Rad Material to Processing Pad	NPA
A0116017	Action Request	Leaking Radioactive Source - NCR Initiation	PBA
A0134903	Action Request	Loss of Contamination Control in I&C Sea Train in East Yard	NPA
A0167496	Action Request	Radioactive Spill in the Charging Pump Room	PBA
A0302116	Action Request	Radioactive Particle Found Outside of the RCA	NPA
A0367437	Action Request	Cracks in Retaining Wall (Laundry Building)	PBA
A0392159	Action Request	Floor Drains Backing Up	PBA
A0573254	Action Request	RCA Boundary Established in Lot 1 for Vendor Refueling Equipment	SOCA
A0623300	Action Request	Radioactive Liquid Spill in the RHR Pump Room 2-1	PBA
A0652054	Action Request	Radioactive Spill When Venting U1 RHR	PBA
A0658602	Action Request	C6MI_CICSP_20180219_160014.893 – Sr-90 in REMP Sample from Diablo Creek	WOCA, DCA
A0707823	Action Request	Hole in 55-Gallon Drum	PBA
A0712018	Action Request	Temporary Storage of Radioactive Material at the ISFSI Pad	NOCA
A0741786	Action Request	Potential Adverse Trend in Radioactive Material Control	PBA
A0741794	Action Request	Spill of Radioactive Liquid Outside of a Contamination Area	NPA
A0223131	Action Request	Diesel Fuel Oil Spill at Vehicle Fuel Station	SOCA
A0327705	Action Request	Diesel Fuel Oil Released onto Ground West of Vehicle Garage	NOCA
A0335864	Action Request	Oil Leaks at Main Transformers	NPA

Document ID	Document Type	Document Title	Study Area Affected
A0363729	Action Request	Change Out Sand in Shooting Traps @ Shooting Range	SOCA
A0334383	Action Request	Soil Contaminated with Diesel Fuel Near 0-2 DFO Storage Tank	NPA
A0417487	Action Request	Environmental Documentation of DFO Cont. Soil	NPA
A0363558	Action Request	Turbine Bldg. Buttress Historic Contamination Clean-up	PBA
A0592032	Action Request	Tracking for Removal of Underground Tank at U2CMS	SPA
A0738064	Action Request	U2 Main Transformer Fire	NPA
50036571	Notification	Loose Asbestos & Lead Debris on the 115’	NPA
50486750	Notification	Excavated Area Has Oil Mixed in Sub-Soil (Unit 2 Transformer Yard)	NPA
DCL2004505 DTSC Closure Certification Report MST-AST.doc	PG&E Letter DCL-2004-505	Closure of Maintenance Shop Lab Wastewater AST	WOCA
DCL2004506 DTSC Closure Certification Report CMS-UST.doc	PG&E Letter DCL-2004-506	Closure of the Cold Machine Shop Underground Storage Tank	SPA

APPENDIX B: SUMMARY OF INTERVIEWS

Interviewee	Title/Position	Years of Service	Topic(s) of Interview
Clint Miller	Radwaste Engineer	32	• Liquid, gaseous, and solid radioactive waste systems. • Concentrations of radionuclides in waste streams. • Radioactive releases and spills.
Gene Newman	Operations Consultant	44	• Operational events involving radioactive material. • Operational events involving hazardous material. • Hazardous building materials
John Knemeyer	Senior Consulting Chemistry Engineer	38	• Blowdown Processing System • Condensate Polishing System • Analysis for tritium and carbon-14
Lance Million	Supervisor, Radiation Protection	32	• Steam Generator Replacement Project • Primary Water Storage Tank • Fire Water Storage Tank • 115-ft Elevation Solidification Pad • Bioremediation Area
Martin Wright	Radiological Environmental Engineer	32	• Radiological Environmental Monitoring Program Groundwater Protection Initiative • Old Steam Generator Storage Facility
Mike Sarantos	Supervisor, Radiation Protection	25	• Transfer of Old Steam Generators and Old Reactor Heads to the Old Steam Generator Storage Facility • Used Fuel Transfer Operations • Transformer Fires • Area 10 Hazardous Waste Storage • Diesel Fuel Spill -Unit 1 Buttress Building

Interviewee	Title/Position	Years of Service	Topic(s) of Interview
Trevor Rebel	Decommissioning Environmental Supervisor	21	• PG&E guide during site walk downs of structures and areas • General history of radioactive material use within each area • General history of chemical (non-radioactive) material use, storage areas and spills within each area • Shooting range investigation and remediation • General site processes/practices
Bryan Cunningham	Supervisor of Environmental Services	17	• USTs and ASTs • RCRA Hazardous waste storage areas and closures • Transformer yards • Shooting range investigation and remediation • Laundry Facility • Abrasive blasting areas • General site chemical storage and spills