April 24, 2009

PG&E Letter DCL-09-025

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Docket No. 50-275, OL-DPR-80
Docket No. 50-323, OL-DPR-82
Diablo Canyon Units 1 and 2
2008 Annual Radioactive Effluent Release Report

Dear Commissioners and Staff:

Pacific Gas and Electric Company is submitting the enclosed 2008 Annual Radioactive Effluent Release Report in accordance with 10 CFR 50.36a (a)(2), and Section 5.6.3 of the Diablo Canyon Power Plant Technical Specifications.

The report describes the quantities of radioactive gaseous and liquid effluents released from the plant, and the solid radioactive waste shipments made during the period of January 1, through December 31, 2008.

Recommendations are made as a result of this submittal.

One compact disk is being sent with the report. The disk contains meteorological data. If you have any questions, please contact Jeff Gardner of my staff at (805) 545-4385.

Sincerely,

James R. Becker

swh/64002712
Enclosure
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DIABLO CANYON POWER PLANT
2008 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT

January 1 - December 31, 2008

DIABLO CANYON POWER PLANT

Annual Radioactive Effluent Release Report
January 1, 2008, Through December 31, 2008

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DIABLO CANYON POWER PLANT

Annual Radioactive Effluent Release Report
January 1, 2008 Through December 31, 2008

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1. License Basis Impact Evaluation 2008-001, "Auxiliary Control Board Replacement - Phase 2"

2. Nuclear Power Generation Program Directive Procedure, CY2, “Radiological Monitoring and Controls Program,” Revision 6

3. Nuclear Power Generation Interdepartmental Administrative Procedure (IDAP), CY2.ID1, “Radioactive Effluent Controls Program,” Revision 9

4. IDAP RP1.ID11, “Environmental Radiological Monitoring Procedure,” Revision 8

5. Diablo Canyon Power Plant Chemical Analysis Procedure, CAP A-8, “Off-Site Dose Calculation Procedure,” Revision 32

6. Diablo Canyon Power Plant Administrative Procedure, RP2.DC2, “Radwaste Solidification Process Control Program,” Revision 14

7. 2008 Land Use Census

DIABLO CANYON POWER PLANT

2008 Annual Radioactive Effluent Release Report

Introduction

The 2008 Annual Radioactive Effluent Release Report summarizes gaseous and liquid effluent releases from Diablo Canyon Power Plant's (DCPP) Units 1 and 2. The report includes the dose due to release of radioactive liquid and gaseous effluents and summarizes solid radwaste shipments. The report contains information required by Units 1 and 2 Technical Specification (TS) 5.6.3, and is presented in the general format of Regulatory Guide 1.21, “Measuring, Evaluating, and Reporting Radioactivity in Solid Wastes and Releases of Radioactive Materials in Liquid and Gaseous Effluents from Light-Water Nuclear Power Plants,” Appendix B, “Effluent and Waste Disposal Report.” Procedure revisions, which implement the Off-Site Dose Calculation Manual (ODCM), and one compact disk containing meteorological data, are attached.

In all cases, the plant effluent releases were well below TS limits for the report period.

I. Supplemental Information

A. Regulatory Limits

1. Gaseous Effluents

a. Noble Gas Dose Rate Limit

The dose rate in areas at or beyond the site boundary due to radioactive noble gases released in gaseous effluents is limited to less than or equal to 500 millirem (mR) per year to the total body, and less than or equal to 3000 mR per year to the skin. (Radioactive Effluent Controls Program [RECP], 6.1.6.1.a.)

b. Particulate and Iodine Dose Rate Limit

The dose rate in areas at or beyond the site boundary due to iodine-131, iodine-133, tritium, and all radionuclides in particulate form with half-lives greater than 8 days in gaseous effluents, is limited to less than or equal to 1500 mR per year to any organ. (RECP 6.1.6.1.b)

c. Noble Gas Dose Limit

The air dose due to noble gases released in gaseous effluents from each reactor unit to areas at or beyond the site boundary is limited to the following:

Radiation Type	**Calendar Quarter Limit RECP 6.1.7.1.a**	**Calendar Year Limit RECP 6.1.7.1.b**
Gamma	5 millirad	10 millirad
Beta	10 millirad	20 millirad

d. Particulate and Iodine Dose Limit

The dose to an individual from iodine-131, iodine-133, tritium, and all radionuclides in particulate form with half-lives greater than 8 days in gaseous effluents released from each reactor unit to areas at or beyond the site boundary is limited to less than or equal to 7.5 mR to any organ in any calendar quarter, and less than or equal to 15 mR to any organ during a calendar year. (RECP 6.1.8.1)

2. Liquid Effluents

a. Concentration

The concentration of radioactive material released from the site is limited to the concentrations specified in 10 CFR 20, Appendix B, Table 2, Column 2, for radionuclides other than dissolved or entrained noble gases. For dissolved or entrained noble gases, the concentration is limited to 2×10^{-4} microcuries/milliliter (μCi/ml) total activity. (RECP 6.1.3.1)

b. Dose

The dose or dose commitment to a member of the public from radioactive materials in liquid effluents released from each reactor unit to areas at or beyond the site boundary is limited to the following:

Dose Type	**Calendar Quarter Limit RECP 6.1.4.1.a**	**Calendar Year Limit RECP 6.1.4.1.b**
Total Body	1.5 millirem	3 millirem
Any Organ	5 millirem	10 millirem

B. Maximum Permissible Concentrations

1. Gaseous Effluents

Maximum permissible concentrations are not used for determining allowable release rates for gaseous effluents at DCPP.

2. Liquid Effluents

The concentrations listed in 10 CFR 20, Appendix B, Table 2, Column 2, for radionuclides other than dissolved or entrained noble gases are used for determining the allowable release concentration at the point of discharge from the site for liquid effluents. For dissolved or entrained noble gases, the allowable release concentration at the point of discharge is limited to 2×10^{-4} μCi/ml total activity for liquid effluents.

C. Measurements and Approximations of Total Radioactivity

1. Gaseous Effluents

a. Fission and Activation Gases

A pair of offline monitors equipped with beta scintillator detectors monitors the gaseous radioactivity released from the plant vent. The monitor readings are correlated to isotopic concentration based on laboratory isotopic analysis of grab samples using a germanium detector.

For plant vent noble gas releases, grab sample results are used to quantify releases. The individual batch release data are used to quantify the radioactivity discharged from the gas decay tanks and containment.

A noble gas grab sample is obtained and analyzed at least weekly. The isotopic mixture is assumed to remain constant between grab sample analyses.

Containment purges, gas decay tank releases, and air ejector discharges are released via the plant vent.

The gaseous radioactivity released from the steam generator blowdown tank vent is measured by analyzing liquid or steam condensate grab samples with a germanium detector. A factor R, a ratio of unit masses between water flashing to steam and water entering the tank, is used to calculate the activity. The isotopic concentrations are assumed to remain constant between grab samples.

Other potential pathways for releasing gaseous radioactivity are periodically monitored by collecting grab samples and analyzing these samples with a germanium detector system.

b. Iodines

Radioiodines released from the plant vent are monitored by continuous sample collection on silver zeolite cartridges. The cartridges are changed at least weekly and analyzed with a germanium detector. The radioiodine releases are averaged over the period of cartridge sample collection.

Other potential pathways for releasing radioiodines are periodically monitored by collecting samples using charcoal

or silver zeolite cartridges and analyzing with a germanium detector.

Radioactive materials in particulate form released from the plant vent are monitored by continuous sample collection on particulate filters. The filters are changed at least weekly and analyzed with a germanium detector. The particulate radioactivity is averaged over the period of particulate filter sample collection. Each filter is analyzed for alpha emitters using an internal proportional counter. Plant vent particulate filters collected during a quarter are used for the composite analysis for strontium-89 and -90, the analysis of which is performed by a contract laboratory.

Other potential pathways for releasing radioactive particulate are periodically monitored by collecting samples using particulate filters and analyzing these filters with a germanium detector.

c. Tritium

Tritium released from the plant vent is monitored by passing a measured volume of plant vent sample through a water column and determining the tritium increase in the water. An aliquot of the water is counted in a liquid scintillation spectrometer. The minimum routine sample frequency for tritium is weekly. The tritium concentration is assumed to remain constant between samples.

d. Estimations of Overall Error

Sources of error considered for batch release are:
(1) calibration source, (2) calibration counting, (3) sampling, (4) sample counting, and (5) gas decay tank pressure gauge/containment exhaust fan flow rate.

Sources of error for continuous release are: (1) calibration source, (2) calibration counting, (3) sampling, (4) sample counting, (5) process monitor (RE-14) reading (fission gases only), and (6) plant vent exhaust fan flow rate.

Total error = $(\sigma^2_1 + \sigma^2_2 + \sigma^2_3 + \ldots \sigma^2_i)^{1/2}$

Where σ_i = error associated with each component.

2. Liquid Effluents

a. Batch Releases

Each tank of liquid radwaste is analyzed for principal gamma emitters using a germanium detector prior to release. A monthly prerelease analysis includes dissolved and entrained gases. Volume proportional monthly and quarterly composites are prepared from aliquots of each tank volume discharged. The monthly composite is analyzed for tritium using a liquid scintillation spectrometer and gross alpha radioactivity using an internal proportional counter. The quarterly composite is analyzed for iron-55 and for strontium-89 and -90 by a contract laboratory. The monthly composite for discharges from the auxiliary building are also analyzed for nickel-63, uranium-233/234/235/236/238 and plutonium-238/239/240/241/242 by a contract laboratory.

b. Continuous Releases

For the continuous liquid releases of the steam generator blowdown tank and turbine building sump oily water separator, daily grab samples are collected, and aliquots are proportioned for weekly, monthly, and quarterly composites.

The oily water separator weekly composite is analyzed for principal gamma emitters using a germanium detector. The steam generator blowdown tank weekly composite is analyzed for principal gamma emitters and iodine-131.

The steam generator blowdown tank monthly composite is analyzed for tritium using a liquid scintillation spectrometer, and for gross alpha using an internal proportional counter.

The steam generator blowdown tank quarterly composite is analyzed for iron-55 and for strontium-89 and strontium-90 by a contract laboratory. The results for each of the composites are averaged over the period of the composite.

In addition, one grab sample of the steam generator blowdown tank is analyzed monthly for dissolved and entrained gases using a germanium detector. The results of

this analysis are assumed to remain constant over the period of one month.

A grab sample of the steam generator blowdown is collected at least weekly and analyzed for gamma activity using a germanium detector. This analysis is used to monitor activity, however, is not used in effluent calculations unless a significant change is detected.

Note on dilution volume:

Tables 4A, 4B, and 4C, "Liquid Effluents - Summation of All Releases," Item F, lists the, "Volume of circulating saltwater used during release periods," in liters. This value is calculated by multiplying the discharge duration by the circulating water flow rate. The values listed in the Tables are the summation of the circulating water discharge volume calculated for each individual batch and continuous discharge period. Therefore, in the case where two or more simultaneous discharges into the same circulating water are occurring, the calculated volume of circulating water is duplicated, and therefore the sum of the dilution volumes for the batch releases and continuous releases are greater than the actual dilution volume since each discharge incorporates the circulating discharge flow rate in its own dose calculation.

c. Estimation of Overall Error

Sources of error considered are: (1) calibration source error, (2) calibration counting error, 3) sampling error, (4) sample counting error, and (5) volume of waste release error.

These sources of error are independent; therefore the total error is calculated according to the following formula:

Total error = $(\sigma^2_1 + \sigma^2_2 + \sigma^2_3 + \ldots \sigma^2_i)^{1/2}$

Where σ_i = error associated with each component.

D. Batch Releases

1. Liquid

a. Number of batch releases….....	606
b. Total time period for batch releases……..	2622 hours
c. Maximum time period for a batch release…….....	168 hours
d. Average time period for a batch release.....…...	4.33 hours
e. Minimum time period for a batch release.....….....	0.15 hours
f. Average saltwater flow during batch releases.….....	9.16E+05 gallons per minute (gpm)

2. Gaseous

a. Number of batch releases.....……...	140
b. Total time period for batch releases.....	1942 hours
c. Maximum time period for a batch release.....	72.00 hours
d. Average time period for a batch release…….....	13.87 hours
e. Minimum time period for a batch release..……...	1.00 hours

E. Abnormal Release (Gaseous and Liquid)

No abnormal releases occurred during 2008.

II. Major Changes to Liquid, Gaseous, and Solid Radwaste Treatment System

An design change was implemented in 2008 that affected the gaseous radwaste treatment system.

The Auxiliary Building Control Board for Diablo Canyon Power Plant (DCPP) provides an Operator Station to control the receiving, storage, treatment, and discharge of liquid and gaseous radwaste products generated by both Units. The obsolete pneumatic fluidic logic system was replaced by a digital control system. This change is documented in Design Change Package (DCP) J-49855.

Changes to the following sections of the FSAR have been approved:

7.7.1.11.3, 11.2.2.2, 11.2.2.3, 11.3.2 and 15.4.7.1.

DCPP Procedure CY2.ID1, "Radioactive Effluent Controls Program," requires that the following be contained in the discussion of a change such as DCP J-49855.

A. Evaluation that led to the determination that the change could be made in accordance with 10 CFR 50.59:

A copy of the 10 CFR 50.59 Evaluation is included in Appendix 1.

B. Information to totally support the reason for the change without benefit of additional or supplemental information:

A digital control system replaced an obsolete pneumatic fluidic logic system. The system controls the operation of various control valves for the waste gas collection, processing, storage, and disposal system. The design function and administrative controls for gaseous radwaste releases has not changed.

The control board panel configurations and indications needed improvements, from a human factors standpoint. Many of the panel instruments and controllers were air operated and no longer available. The original vendor no longer manufactures replacement parts. A replacement vendor for parts is not available.

As a pneumatic dependent system, tubing and control elements were susceptible to leaks.

The overall objective was to replace the obsolete control board system with a new digital control system. The new system was designed with redundant networking systems and independent power sources. The new digital control system is also designed to enhance the ability for operations

to control and monitor processes. The new system consolidates needed information onto a display that provides much more effective view of system operation. Although there is a fundamental change to the way information is presented and how controls are interacted with the operator, the control capability requirements have not been impacted.

C. Description of the equipment, components, and processes involved and the interfaces with other plant systems:

The overall scope of the design change established the following:

- Data acquisition and control system (DACS)
- Redundant controller/communication chassis
- Three remote input/output chassis, each with independent power supplies.
- An auxiliary maintenance terminal
- Network connections to DACS
- System upgrade to controls/indications:
    - Fluidic logic replacement/gas decay tanks
    - Waste gas compressor
    - Miscellaneous equipment drain tank/auxiliary building sump level controls
    - Boric acid concentrates holding tank 0-2
    - Annunciation alarms
    - Oxygen analyzer 2 percent alarms and 4 percent trip
    - Selected annunciation at other panels

D. Evaluation of the change which shows the predicted releases of radioactive materials in gaseous effluent that differ from those previously predicted in the license application:

No change was made in the function or administrative controls. Therefore, this design change is not intended to change the quantity of gaseous radioactive material releases.

E. Evaluation which shows the expected maximum exposure to a member of the public in the unrestricted area and to the general population that differ from those previously estimated in license application:

No change was made in the function or administrative controls. Therefore, this design change is not intended to change the expected dose due to the release of gaseous radioactive material.

F. Comparison of the predicted releases of radioactive material, in liquid effluents and solid waste, to the actual releases for the period prior to when the change are to be made.

No change was made in the function or administrative controls. Therefore, this design change is not intended to change the quantity of gaseous radioactive material releases.

G. Estimate of the exposure to plant operating personnel as a result of the change:

No change was made in the function or administrative controls. Therefore, this design change is not expected to change the exposure to plant operating personnel.

III. Changes to the Offsite Dose Calculation Manual (ODCM)

The DCPP ODCM is made up of the following procedures:

- Nuclear Power Generation Program Directive Procedure, CY2, “Radiological Monitoring and Controls Program” (RMCP)
- Nuclear Power Generation Interdepartmental Administrative Procedure (IDAP), CY2.ID1, “Radioactive Effluent Controls Program” (RECP)
- IDAP RP1.ID11, “Environmental Radiological Monitoring Procedure (ERMP)
- DCPP Chemical Analysis Procedure, CAP A-8, “Offsite Dose Calculation Procedure” (ODCP)

Changes made to these procedures during the reporting period are described below. A copy of each revision made during the reporting period is included as an attachment.

If no changes were made to a particular procedure during the reporting period, the most recent revision is included as an attachment in order to provide a complete, current copy of the ODCM used during the reporting period.

Also included is a description of the changes made to DCPP Administrative Procedure, RP2.DC2, “Radwaste Solidification Process Control Program,” (PCP).

A. Changes to the RMCP

1. Figure 1: The figure's title and box formatting were edited. No information was changed.

2. Section 3, "<u>DEFINITIONS</u>:" Hyphens were replaced with colons at the end of each item.

3. Section 4.3: The "Example" was revised. The previous example referred to a group that has since been changed.

4. Section 5, "RESPONSIBILITIES:"

   a. The responsibilities of the "plant services vice president" were moved to the "chief nuclear officer" [CNO]. The "plant services vice president position no longer exists. A variety of groups formerly under that position now report directly to the CNO. Rather than listing many of them, the responsibility was rolled up to the CNO.

   b. The "plant operations vice president" was changed to "site vice president and station director."

   c. The "plant services vice president" was deleted. Its responsibilities were added to the "chief nuclear officer."

   d. The "station director" was changed to "senior director operations services." The groups most involved with the radiological monitoring and controls program report directly to this position (Chemical and Environmental Operations, Radiation Protection [RP], Operation Services).

   e. The "engineering director" was changed to "senior director engineering services."

   f. The "licensing director" was changed to "quality verification director."

5. Section 12, "SPONSOR:" This section was deleted to conform to current format guidance.

6. Revision 6 was approved by the CNO on May 28, 2008. See Attachment 2.

B. Changes to the RECP

1. References to "TES" [Technical & Ecological Services] was deleted from the procedure. This company organization no longer exists. The responsibilities this group maintained for Radiological Environmental Monitoring Program (REMP) now reside with the plant's RP section.

2. The Plant Safety Review Committee (PSRC) no longer approves major changes to the radwaste treatment system. Therefore, a step was deleted that required evidence should be provided in the annual rad effluent report showing PSRC approval of major changes to the radwaste treatment system.

3. Clarifications were made to Tables 6.1.1-1, 6.1.3-1, and 6.1.6-1.

4. Revision 9 was approved by the Station Director on July 10, 2008. See Attachment 3.

C. Changes to ERMP

1. Editorial changes were made to identify the change in name of the "California Department of Health Services" to "California Department of Public Health."

2. Responsibilities for the REMP engineer and vendor lab were revised.

3. Monitoring of the old steam generator storage facility (OSGSF) was added.

4. Several Action Requests (problem reports) were added to "REFERENCES."

5. Some station codes were updated.

6. Some additional sampling at certain locations, and by the State, were added.

7. Laboratory Sr-89/90 LLD values were updated.

8. Revision 8 was approved by the Station Director on June 20, 2008. See Attachment 4.

D. Changes to the ODCP

1. Two position titles were updated in the "RESPONSIBILITIES" section.

2. Added Te-125m to the liquid radwaste list of isotope dose factors.

3. Updated the X/Q and D/Q values based upon the 2003-2007 5-year average values calculated by PG&E's Meteorological Services.

4. Revision 32 was approved by the Station Director on July 13, 2008. See Attachment 5.

E. Changes to PCP

IDAP RP2.DC2 was not revised during the reporting period. See Attachment 6.

IV. Land Use Census

Changes to the Land Use Census Program are included as Attachment 7.

V. Gaseous and Liquid Effluents

Tables 1 through 3 describe gaseous effluents. Tables 4 through 6 describe liquid effluents.

VI. Solid Radwaste Shipments

Solid Waste and Irradiated Fuel Shipment

A. Solid Waste Shipped Off-site for Burial or Disposal (Not irradiated fuel)

1. Type of Waste	Unit	12 Month Period	Est. Total Error, %
a. Spent Resins, Filter Sludges, Evaporator Bottoms, etc.	m^3 Ci	5.85E+00 1.89E+02	9.00E+0
b. Dry Compressible Waste, Contaminated Equipment, etc.	m^3 Ci	3.15 E+01 9.93E+00	9.00E+0
c. Irradiated Components, Control Rods, etc.	m^3 Ci	8.83E-01 1.68E+00	0.00E+0
d. Other	m^3 Ci	0.00E+0 0.00E+0	0.00E+0

2. Estimate of Major Nuclide Composition (by type of waste)

a.

Ni-63	%	4.11E+01
Co-60	%	2.49E+01
Fe-55	%	1.59E+01
Zn-65	%	1.22E+00
Sb-125	%	1.34E+00

b.

Fe-55	%	5.95E+01
Co-60	%	1.34E+01
Ni-63	%	7.90E+00
H-3	%	3.37E+00
Zn-65	%	1.25E+00

c.

Not Applicable	%	N/A

d.

Not Applicable	%	N/A

Solid Waste and Irradiated Fuel Shipment (Continued)

3. Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
3	Truck	Barnwell, SC
13	Truck	Clive, UT
7	Rail	Clive, UT

4. Supplemental Information Required by former TS 6.9.1.6

Solidification Agent	Type of Container	Number of Containers	10 CFR 61 Waste Class	Shipping Type
Cement	IP1	1	C	IP2 - LSAII
Polymer	IP1	1	B	Type B
Cement	IP1	1	B	IP1 - LSA
None	IP1	28	AU	IP1 - LSA

B. Irradiated Fuel Shipments (Disposition)

Number of Shipments	Mode of Transportation	Destination
None	N/A	N/A

VII. Radiation Dose Due to Gaseous and Liquid Effluents

Radiation Doses

A. Radiation Doses from Radioactive Liquid Effluents

The radiation dose contributions due to releases of radioactive liquid effluents to the total body and each individual organ for the maximum exposed adult have been calculated in accordance with the methodology in the ODCP. Dose contributions listed in Table 7 show conformance to RECP 6.1.4.1.

B. Radiation Doses from Radioactive Gaseous Effluents

The radiation dose contributions due to radioactive gaseous effluents at the site boundary for the land sectors have been calculated in accordance with the calculation methodology in the ODCP. Each unit's dose contribution has been calculated separately. The latest five-year historical average meteorology conditions were used in these calculations. In addition to the site boundary doses, the dose to an individual (critical receptor) due to radioiodines, tritium, and particulates released in gaseous effluents with half-lives greater than eight days is determined in accordance with the methodology in the ODCP based on the methodology described in NUREG-0133. Dose contributions listed in Table 8, which represents the maximum dose for age groups, organs, and geographic locations for the report period, show conformance to RECP 6.1.6.1, 6.1.7.1, and 6.1.8.1.

C. Radiation Doses from Direct Radiation (Line-of-Sight Plus Sky-Shine) - Closest Site Boundary

For the report period, the radiation dose is evaluated to be 6.19E-01 mR, assuming 24-hour per day exposure, due to the presence of:

- Radioactive waste containers outside of plant buildings
- The storage of contaminated tools and equipment inside plant buildings
- OSGSF, which loaded with Unit 2 old steam generators for the first time in 2008.

D. Radiation Doses from Chemistry Laboratory Radioactive Gaseous Effluents - Closest Site Boundary (800m)

The radiation dose due to chemistry laboratory radioactive gaseous effluents for the report period is evaluated to be 4.62E-06 mR.

E. Radiation Doses from Post Accident Sampling System Radioactive Gaseous Effluents - Closest Site Boundary (800m)

The radiation doses due to post accident sampling system radioactive gaseous effluents for the report period is evaluated to be 1.15E-6 mR.

F. 40 CFR 190 Considerations

The release of radioactivity in liquid and gaseous effluents resulted in doses that are small percentages of the TS limits as shown in Tables 9 and 10. This, coupled with the fact that there are no other uranium fuel cycle sources within eight kilometers of the DCPP, shows conformance to 40 CFR 190.

G. Radiation Doses from Radioactive Liquid and Gaseous Effluents to Members of the Public Due To Their Activities Inside The Site Boundary

1. Liquid Effluents

The radiation dose to members of the public within the site boundary due to the release of radioactive liquid effluents is negligible because the discharge piping for liquid radwaste is mostly imbedded in concrete, located in remote or inaccessible areas, or is underground. In addition, the quantity of radioactivity released was very low.

2. Gaseous Effluents

The radiation dose to members of the public within the site boundary due to the release of radioactive gaseous effluents are listed in Table 11.

H. Radiation Dose from Radioactive Gaseous Effluents to Individual Due to Consumption of Grazing Animals on Property Surrounding the Site.

The Land Use Census identified that during 2008, ranchers in the area around the plant slaughtered goat, sheep, deer, wild pig and cattle for personal consumption. As part of the DCPP REMP, samples of cow, goat, deer, and sheep meat were analyzed for radioactivity. Results of those analyses are available in the 2008 REMP report

Based upon the isotopes discharged in gaseous form during 2008, the maximum calculated dose due to these identified meat pathways is 1.55E-01 mrem.

I. Subsurface Water Radioactive Contamination

Recent industry events have identified equipment leaks containing low levels of radioactivity, resulting in contaminated ground water and storm water radioactivity concentrations that may leave the plant sites. Suspected plant equipment leaks that could result in such an event at DCPP are documented in the corrective action program. Analysis of samples of subsurface water at DCPP has indicated the presence of tritium. At this time, we have no reason to point to plant system leakage as the source for this tritium.

Sampling and analysis of the Auxiliary building roof drains, auxiliary building drywell, and the containment structure observation wells have identified detectable tritium activity. This tritium is most likely coming from the rain wash-out of gaseous tritium exiting the plant vent system. This tritium is being accounted for in the plant vent release, and rain water tritium is being accounted for per plant approved procedures. This practice will continue until such time that new industry guidance is provided to account for this pathway in a different manner.

Refer to the 2008 REMP report for the data that has been evaluated to date for the sampling locations.

Notes for Tables 8A and 8B

1. This represents the maximum dose of age groups, organs, and geographic locations for the quarter and the year.

2. Radioiodines, radioactive material in particulate form, and radionuclides other than noble gases with half-lives greater than eight days.

3. The inhalation and ground plane pathways are included for this location.

4. The inhalation, ground plane, and vegetable pathways are included for this location. An occupancy factor of 0.5 was used for the inhalation and ground plane pathways. The teenage group had the highest calculated dose for this location.

VIII. Meteorological Data

Meteorological Data

The hour-by-hour listing of wind speed, wind direction, atmospheric stability, and precipitation is contained on compact disc with this submittal.

Compact Diskette Information

Filename	Sensitivity	File Size	Description
NRC05	Non-SGI	1.3 Mb	Diablo Canyon Primary Meteorological Date

Special Instructions: The CD-R media are read-only, 700MB compact diskettes.

On May 21, 2008, the primary meteorological tower was damaged by crane operations. The primary meteorological tower was replaced during the third quarter of 2008. Due to this event, meteorological data shows a higher frequency of west-northwest wind direction when compared to previous periods. This change in frequency is due to substitution of data from the 10 meter level from the backup meteorological tower during the summer months while repair were made to the out-of-service primary meteorological tower.

Attachment 1

License Basis Impact Evaluation 2008-001
Auxiliary Control Board Replacement - Phase 2
DCP J-49855

Attachment 2

Nuclear Power Generation Program Directive Procedure, CY2, "Radiological Monitoring and Controls Program," Revision 6

Attachment 3

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Attachment 4

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Attachment 5

Diablo Canyon Power Plant Chemical Analysis Procedure, CAP A-8, "Offsite Dose Calculation Procedure," Revision 32

Attachment 6

Diablo Canyon Power Plant Administrative Procedure, RP2.DC2, “Radwaste Solidification Process Control Program,” Revision 14

Attachment 7

2008 Land Use Census

2008 DCPP LAND USE CENSUS

Diablo Canyon Power Plant (DCPP) Radiological Environmental Monitoring Program (REMP) personnel conducted a Land Use Census in the vicinity of DCPP for 2008. The land use census is based on Nuclear Regulatory Commission Regulatory Guide 8, "Environmental Technical Specifications for Nuclear Power Plants" and 10 CFR 50 Appendix I, Section IV, B. 3. DCPP Program Directive CY2, "Radiological Monitoring and Controls Program" requires performance of a land use census.

DCPP IDAP RP1.ID11, "Environmental Radiological Monitoring Procedure," requires identification of the nearest milk animal, nearest residence, and the nearest broadleaf producing garden greater than 50 square meters (500 square feet) in each of the landward meteorological sectors within a distance of 8 kilometers (5 miles) of the plant. The land use census is conducted at least once per year during the growing season (between Feb 15 and Dec 1) for the Diablo Canyon environs.

The 2008 Land Use Census was conducted via a helicopter overflight and landowner telephone interviews. The helicopter over-flight was conducted on September 3, 2008. The telephone interviews were conducted November 12 through November 20, 2008. Thirteen individual landowners or tenants were contacted.

Milk

No milk animals were identified within the first 8 kilometers (5 miles) of any sector.

Residences

The nearest residence, relative to all sectors, is a small trailer located in the NW sector about 1.93 kilometers (1.2 miles) from the plant. Ranch workers occupy this Blanchard residence approximately 1 month per year during cattle round-ups.

A total of 16 residences were identified within the 8-kilometer (5-mile) radius of the plant, which were confirmed or appear to be occupied during 2008. Two abandoned structures are located in each of the NNW and NNE sectors.

The nearest residence in each sector is summarized in Table 1.

Gardens

The land use census identified two household gardens greater than 50 square meters (500 square feet) that produce broadleaf vegetation. The Read garden is approximately 1/4 acre, and located in the NNE sector at 7.08 kilometers (4.41 miles). The Koonze garden is approximately 500 square feet, and located in the E sector at 7.24 kilometers (4.5 miles).

Mello manages a farm on the coastal plateau, along the site access road, in the ESE sector. The farm starts at approximately 4.8 km and extends to 7.2 km (3 to 4.5 miles) from the plant. This commercial farm produces no broadleaf vegetation. The farm area is about 100 acres of land with 6 to 10 rotational plantings per year (not all 100 acres planted at any one time). Commercial crops consist of about 10 percent squash and 90 percent cereal grass (oat hay). Less than 10 farm workers periodically occupy this area during the growing season.

Additional Land Use

Much of the area outside the plant site-boundary is used for rotational cattle grazing by five separate cattle operations. For purposes of this census, the five cattle ranches are called Blanchard, Sinsheimer, Read, Andre, and Mello.

Blanchard has about 120 cattle outside the plant site-boundary and utilizes the NW, NNW, N, and NNE sectors. About 80 yearling cattle were sold to mass market in 2008. Blanchard slaughtered two cattle in 2008 for personal consumption.

Additionally, Blanchard managed about 200 goats that were used for weed abatement in all landward sectors within the plant site-boundary. During 2008, approximately 100 baby goats were born and then taken to Santa Margarita California where they are grass fed for 1 year. After 1 year, the 100 yearling goats are then to be sold to mass-market. Blanchard slaughtered one goat in 2008 for personal consumption.

Blanchard also managed about 100 sheep outside the plant site-boundary in the NW and NNW sectors. These sheep were allowed to breed and the yearlings were sold to mass market. Blanchard slaughtered one sheep in 2008 for personal consumption.

Blanchard meats were sampled by REMP personnel.

Sinsheimer has about 100 cattle outside the plant site-boundary in the NNE sector. These cattle were allowed to breed and about 90 calves were sold to mass market in 2008. Sinsheimer did not slaughter any cattle for personal consumption in 2008.

Read has about 150 cattle outside the plant site-boundary in the NNE sector.

Andre has about 80 cattle outside the plant site-boundary in the ENE sector. About 80 calves were sold to mass market in 2008. Andre did not slaughter any cattle in 2008 for personal consumption.

Mello manages about 1000 cattle outside the plant site-boundary in the E, ESE, and SE sectors. Harris Ranch Beef Corporation owned these cattle and sold all of them to mass market in 2008. Mello did not slaughter any cattle in 2008 for personal consumption.

Two landowners (Johe and Andre) take wild game for personal consumption outside the plant site-boundary in the NNE, NE, and ENE sectors. This wild game consists of approximately two deer and four wild pigs per landowner.

There is a California State Park Ranger Office in the NNW sector at 7.483 kilometers (4.65 miles) from the plant. Approximately 3 people occupy this office from 1000 to 1500 each day per week.

There is a public campground located in the NNW sector at Montana de Oro State Park at 7.387 kilometers (4.59 miles). This campground is near Spooner's Cove.

Groundwater Impacts

On November 17, 2008, DCPP ceased make-up water usage from Diablo Creek (REMP station 5S2). The lower dam was breached due to Coastal Commission requirements for the Old Steam Generator Storage Facility building permit. Prior to November 17, DCPP used approximately 80 gallons per minute (gpm) of creekwater as a makeup source to the 100K tank which provided water to the plant makeup reservoir. and the 30K tank which provided water to the plant fire suppression system.

To replace the creek makeup water source, DCPP refurbished Water Well 02 (REMP station WW2). Prior to November 2008, this WW2 provided aquifer water at approximately 10 gpm to DCPP makeup systems. After November 2008, WW2 is expected to supply approximately 100 gpm to the 100K and 30K tanks.

WW2 was refurbished to be a production well 350 ft deep with a 10-inch casing. Test results verified the well could sustain more than 150 gpm even during drought conditions. Drawdown test data show the WW2 pump ground elevation at 333 ft above sea level with the maximum drawdown of the well during normal operation at 133 ft above sea level. Therefore, this aquifer resides at an elevation of approximately 133 ft above sea level. With the DCPP power block located at approximately 115 ft to 50 ft above sea level, there is little chance of plant power block communication with the WW2 aquifer.

In support of this WW2 refurbishment, two additional exploration wells were drilled and permitted for testing only. One well is Water Well 04, which is 506 ft deep and is located southwest of WW2. Another test well is Water Well 05, which is 409 ft deep and is located northeast of WW2 in the paved area behind the document storage

building (near the maintenance garage). Both wells are over 1/2 mile to the east of the plant power block. Water Well 04 and Water Well 05 have been capped and are no longer available.

An old 13K water tank is located directly east of the 500 kV switchyard and near Water Well 01 (WW1). This old 13K water tank historically received water from the pre-November 2008 WW2. During these makeup water construction changes, a new 13K water tank was constructed near the actual physical location of WW2. The old 13K was abandoned. The makeup water flow from WW2 is now to this new 13K tank (acting as a surge tank) which then feeds into the 100K tank.

Aquifer testing was conducted by Environmental and Natural Resource Management Consultants, and the final report submitted to DCPP (dated August 22, 2008).

Table 1 summarizes the nearest residence location in each meteorological sector.

Figure 3 shows the location of the residences and gardens in the vicinity of DCPP.

Table 1

Land Use Census 2008
Distance in Kilometers (and Miles) from the Point Located Centrally Between both Units Nearest Milk Animal, Residence, and Vegetable Garden

22½ Degree (a) **Radial Sector**	**Nearest Milk Animal**	**Nearest Residence Km (mi)**	**Residence Azimuth Degree**	**Nearest Vegetable Garden km (mi)**
NW	None	1.93 (1.2)	319.5	None
NNW	None	2.41 (1.5) [b]	331	None
N	None	None	—	None
NNE	None	5.21 (3.2)	019.8	7.08 (4.4) [c]
NE	None	7.89 (4.9)	036	None
ENE	None	7.08 (4.4)	063.5	None
E	None	5.95 (3.7)	097.5	7.24 (4.5) [d]
ESE	None	None	—	5.31 (3.3) [e]
SE	None	None	—	None

Table Notation:

[a] Sectors not shown contain no land (other than islets not used for the purposes indicated in this table) beyond the site-boundary.

[b] Blanchard residence is the full-time residence for critical receptor calculations.

[c] The Read vegetable garden is located in the NNE sector and located at the 020 azimuth degree. There is also a full time residence at this location.

[d] The Koonze vegetable garden is located in the E sector and located at the 098 azimuth degree. There is also a full time residence at this location.

[e] The Mello garden is the commercial farm along the westward side of the site access road; however, it does not produce broadleaf vegetation. This farm extends from 4.8 km to 7.2 km (3 to 4.5 miles) from the plant.

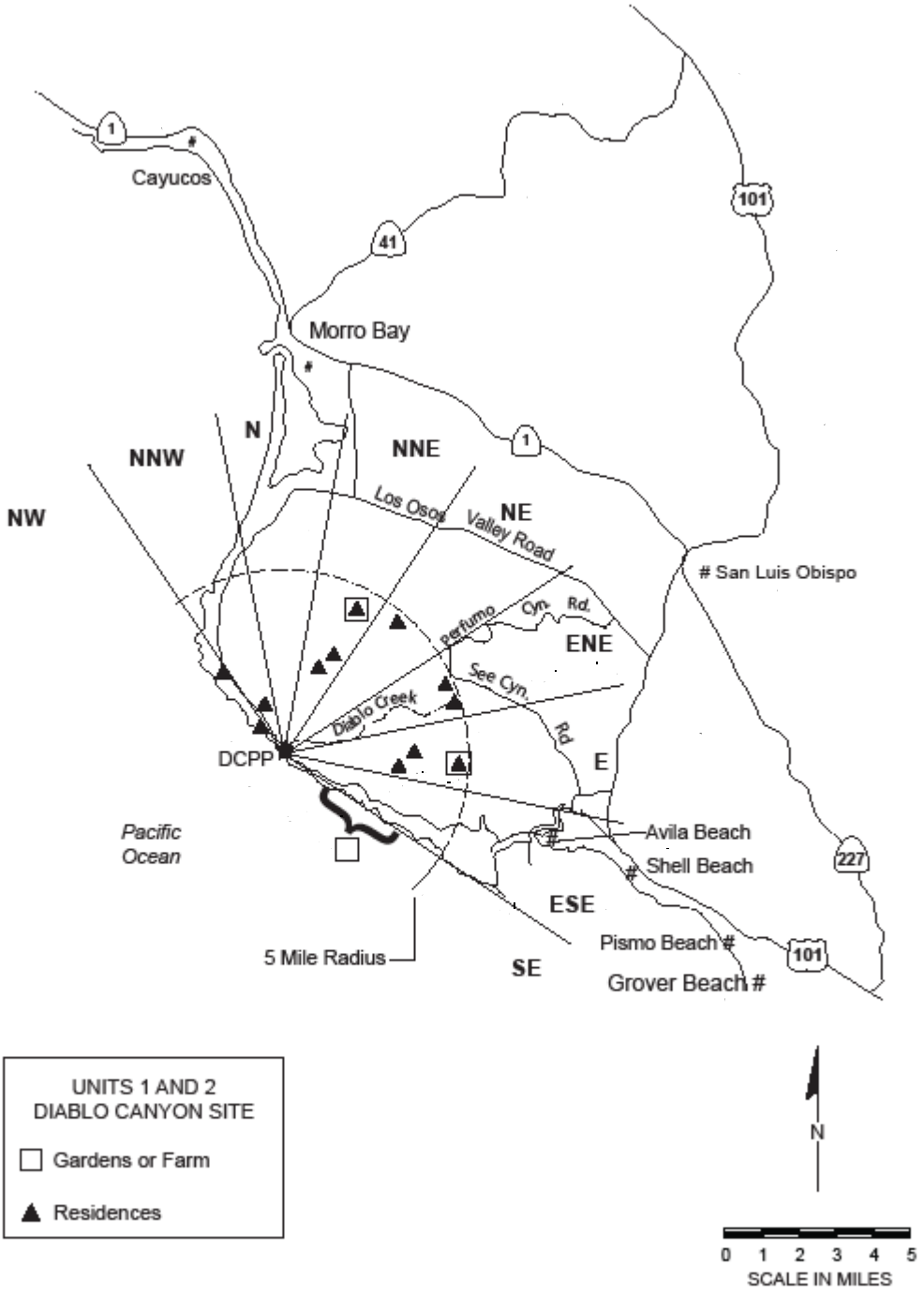

Figure 3. Units 1 and 2 Diablo Canyon Power Plant Land Use Census.

bcc/enc*: Jeffery E. Gardner
Brad C. Hinds
John R. Knemeyer

* To save some paper, bcc's should receive the enclosure without attachments 1-5 (copies of DCPP procedures).

OUTGOING CORRESPONDENCE SCREEN
(Remove prior to NRC submittal)

Document: PG&E Letter DCL-09-025
Subject: **2008 Annual Radioactive Effluent Release Report**
File Location **S:\RS\RA\Annual Reports\2008 RERR\DCL09025.doc**
Version:

FSAR Update Review
Utilizing the guidance in XI3.ID2, does the FSAR Update need to be revised? Yes ☐ No ☒
If "Yes", submit an FSAR Update Change Request in accordance with XI3.ID2 (or if this is an LAR, process in accordance with WG-9)

Commitment #1
Statement of Commitment**:** **NONE**