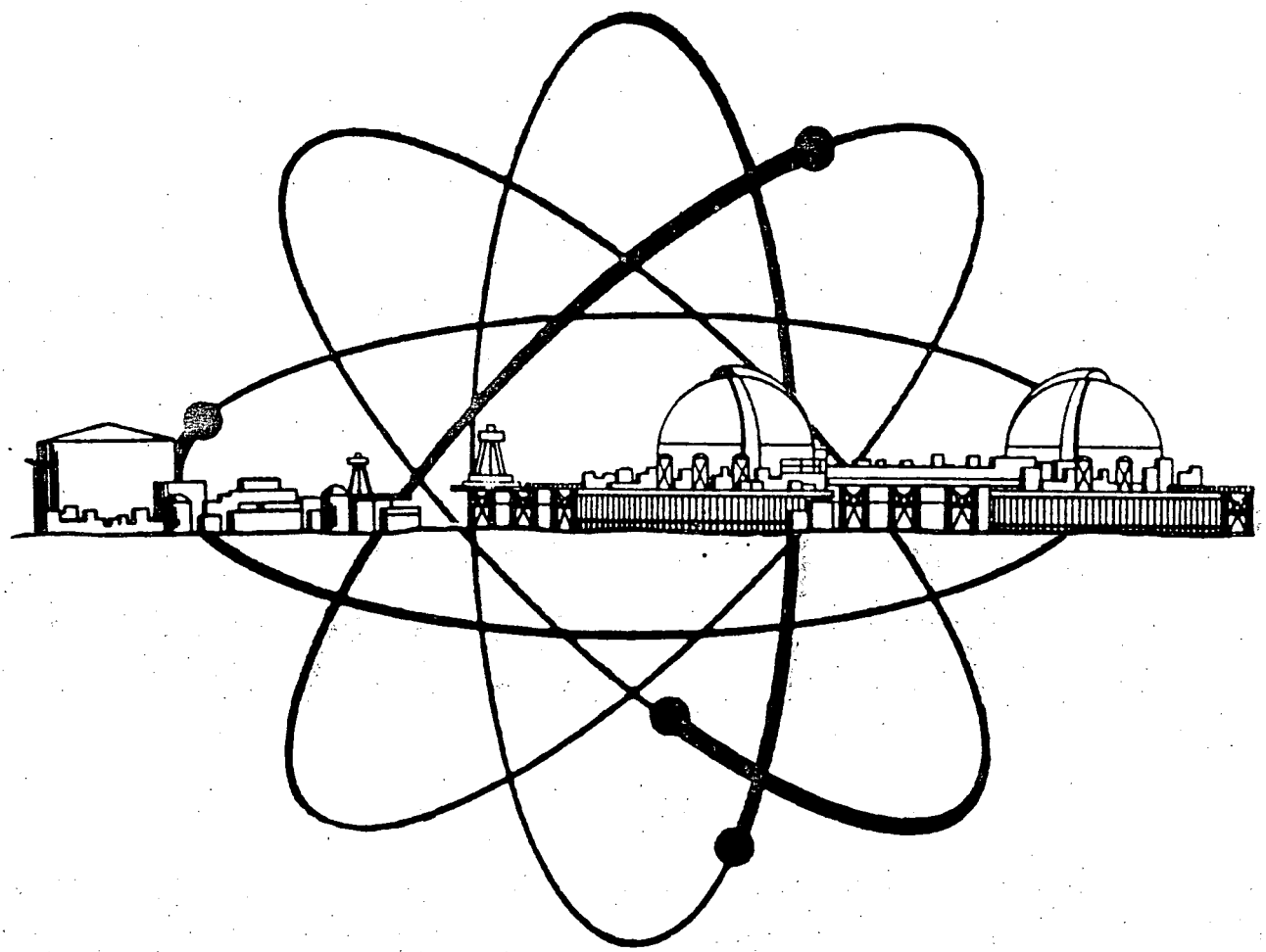
ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT FOR 1986

SAN ONOFRE NUCLEAR GENERATING STATION UNITS 1, 2, & 3



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I. INTRODUCTION

San Onofre Nuclear Generating Station (SONGS) consists of three pressurized water nuclear reactors housed in separate containment buildings. Unit 1 attained initial criticality June 1967, and operated until February 1982 when it was shut down for seismic modifications. The unit was brought back into service during December 1984. Unit 2 and Unit 3 attained initial criticality in July 1982 and August 1983, respectively, and have been in operation since then.

To monitor the operations of SONGS Units 1, 2 and 3, and to fulfill the requirements of the SONGS Technical Specifications, an operational Radiological Environmental Monitoring Program (REMP) was conducted at SONGS during 1986. This program was designed to quantify ambient radiation levels in the environs of SONGS, and to identify and quantify concentrations of radioactivity in various environmental media in the vicinity of SONGS which have a potential exposure pathway to man. Thermoluminescent dosimeters (TLD's) were used to measure direct radiation levels. Sampled environmental media included the following: soil, shoreline sediment (beach sand), air, local crops, non-migratory marine species, kelp, drinking water, ocean water, and ocean bottom sediments. Each of the samples were analyzed for both naturally occurring and SONGS-related radionuclides.

The Program

In its operational phase, the REMP was conducted in accordance with Sections 3.18 and 4.18 of the SONGS Unit 1 Technical Specifications, and Section 3/4.12 of the SONGS Units 2 and 3 Technical Specifications.

Objectives

The objectives of the operational REMP are:

1. To fulfill the obligation for radiological surveillance required by Technical Specifications.

2. To determine whether there is any significant increase in the concentration of radionuclides in critical pathways.

3. To detect any significant change in ambient gamma radiation levels.

4. To verify that the operation of SONGS Units 1, 2 and 3 have no assessable detrimental effects on the health and safety of the public or the environment.

Sample Collection

Samples of various environmental media were obtained in order to meet the stated objectives. The selection of sample types was based on established critical pathways for the transfer of radionuclides through the environment to man, experience gained during the preoperational phase, and the evaluation of data during the operational phase. Sampling locations were determined with consideration given to site meteorology, local demographs, and land uses.

Sampling locations were divided into two classes -- indicator and control. Indicator locations were those expected to manifest effects of SONGS operations. Control stations were at locations considered to be unaffected by SONGS operations.

Sample Analysis

Environmental samples were collected at different locations (listed in Appendix A) in the vicinity of SONGS, and then submitted to a contracted radiological laboratory. Each sample was analyzed using standard chemical procedures. The results of the analyses are summarized in Appendix B, and presented in Appendix I by sample type and analysis. The tabulated means, ranges and standard deviations presented in Appendix B were calculated using standard statistical methods according to the format specified in USNRC Regulatory Guide 4.8 (1975).

To assure quality of sample analyses, a portion of the REMP was devoted to quality control. The main aspects of this part of the program included process quality control, instrument quality control, comprehensive data reviews, and EPA inter-laboratory cross-check analyses. The results of the EPA cross-check analyses are presented in Appendix C.

The impact of SONGS on the surrounding environment was assessed through a series of analyses. These analyses included: (1) comparison of data between indicator and control locations for each sample type, (2) identification of radionuclide concentrations exceeding investigation levels, (3) historical trending of radionuclide concentrations in sampled environmental media over a period of several years, and (4) comparison of operational to preoperational environmental data. Summaries and comparison of indicator to control locations are presented in Section II (page 3) of the report. Other data comparisons are presented in the Appendices.

II. RESULTS AND DISCUSSIONS OF 1986 ENVIRONMENTAL DATA

A. Direct Radiation

The purpose of this program element was to measure the amount of environmental gamma and beta radiation in the vicinity of SONGS. To accomplish this task, calcium sulfate ($CaSO_4$:Dy) and lithium fluoride (LiF) thermoluminescent dosimeters (TLDs) were placed at each of 67 indicator and control locations, collected, and analyzed at prescribed intervals. The control location was situated in Huntington Beach. The calcium sulfate TLDs were collected quarterly and were replaced with re-zeroed dosimeters, while the lithium fluoride dosimeters were collected after an exposure time of one year (i.e., at the end of 1986).

A total of 268 calcium sulfate TLDs and 66 lithium fluoride TLDs were collected and analyzed throughout the year. Due to an instrument malfunction during the reading of the third quarter TLDs, the results for location numbers 1 through 31 were invalid, and are not included in the summary description of the results (below) for the year. (See Appendix A for the corresponding locations.) In an effort to prevent this situation from occurring again, the contract laboratory implemented a new TLD analysis procedure.

Specifically, a technician at the contract laboratory noticed a declining signal from the TLD reader and stopped the reading of the TLDs before reading the TLD for location 32. Standards were run again and the results verified that the instrument was failing. A new reader was then calibrated and was used for the remainder of the TLD readings, starting with TLDs from location 32. In an effort to prevent this from recurring, the contract laboratory has implemented a new procedure wherein only half of the TLDs are read initially, leaving half of the TLDs for backup.

The measured doses were corrected for pre- and postfield exposure times. During the course of the year, the quarterly doses measured at the indicator locations ranged from 9.2 to 35.4 mrem, averaging 19.0 mrem. San Onofre State Beach (location No. 55) had the highest TLD readings for the four quarters. The doses at this location ranged from 23.0 to 26.7 mrem, averaging 24.8 mrem. The quarterly doses measured at the control location, on the other hand, ranged from 21.2 to 22.7 mrem, averaging 21.9 mrem.

The annual direct radiation doses ranged from 41.1 to 123.3 mrem, averaging 86.5 mrem. The dose measured at the control location was 97.3 mrem.

Quarterly doses measured at indicator locations were investigated if they were greater than doses measured at the control location by 25 percent. Because of invalid data for the third quarter for location Nos. 1 through 31, the dose for the control location for the third quarter was set equal to the yearly average dose for the control location (derived from the first, second, and fourth quarter data) -- or 21.9 mrem. Using this criterion, it was determined that there were two quarterly doses that

exceeded preliminary investigation levels. A 35.4 mrem dose was measured at the Site Boundary (location No. 13) during the fourth quarter. Also during the fourth quarter, a dose of 30.4 mrem dose was measured at the East Site Boundary (location No. 16).

Only one annual dose, namely that measured at Unit 1 (location 55) exceeded 1.25 times the control. The dose measured at this location was 123.3 mrem.

Because virtually all the measured doses at locations near SONGS were considered comparable to the direct radiation dose measured at Huntington Beach, it was concluded that SONGS operations had a detectable, but negligible impact on this environmental medium.

B. Airborne Particulate Analysis

Air particulate samples were collected on a weekly basis from eight indicator locations and a control station in Huntington Beach. After collection, the samples were analyzed for gross beta activity with a lower limit of detection of 0.003 pCi/m3 of air. Samples were also composited quarterly and analyzed for 11 naturally-occurring and Station-related radionuclides by gamma spectral analysis, radiostrontium by beta counting, and gross alpha radioactivity by alpha counting.

Gross beta activity was detected in each weekly airborne particulate sample collected in 1986. The concentrations of gross beta activity in the samples collected from the indicator locations ranged from .003 to .89 pCi/m3, with an average concentration of .047 pCi/m3 of air. The concentration of gross beta activity in the samples from Huntington Beach ranged from 0.010 to 0.72 pCi/m3, averaging .046 pCi/m3 of air. See Figures 1, 2, and 3 for 1986 monthly average airborne particulates gross beta activity for selected locations.

Beryllium-7 was the only gamma-emitting radionuclide detected in each quarterly composite airborne particulate sample from both indicator and control locations. The concentration of beryllium-7 in the samples from the indicator locations ranged from 0.061 to 0.130 pCi/m3, with an average concentration of 0.088 pCi/m3 of air. The concentrations of beryllium-7 in the samples collected from the control location ranged from 0.069 to 0.106 pCi/m3, averaging 0.088 pCi/m3 of sample.

Other than beryllium-7, cesium-134 and cesium-137 were the only other gamma-emitters detected in any of the quarterly composite samples. These radionuclides were seen in composite samples collected from Huntington Beach during the last two quarters of 1986. The concentrations of cesium-134 in the composite samples for the third and fourth quarters were determined to be 0.008 and 0.002 pCi/m3, respectively. The concentrations of cesium-137 in the composite samples for the third and fourth quarters were 0.021 and 0.005 pCi/m3, respectively.

When the quarterly composite samples were analyzed for strontium-90 and gross alpha radioactivity, no strontium-90 was detected in any of the composite samples. Gross alpha radioactivity, however, was detected in each composite sample from the first and third quarter, 6 composite samples from the second quarter (i.e., 5 from indicator locations, and one from Huntington Beach), and one composite sample from the fourth quarter (i.e., from the Northeast Site Boundary). The concentrations of gross alpha radioactivity in the samples from the indicator locations ranged from non-detectable to 0.005 pCi/m3, averaging of 0.002 pCi/m3 of air. The concentrations of gross alpha radioactivity in the samples from the control location were comparable, ranging from non-detectable to 0.002 pCi/m3, averaging 0.002 pCi/m3 of air.

Since the radioactivity seen in samples collected from the indicator locations was commensurate to the radioactivity found in samples collected from the control location, the impact of SONGS operations on this environmental medium is considered to be negligible. In addition, significant increase in gross beta activity in May and into June 1986 can be attributed to the Chernobyl nuclear power plant accident that occurred in April 1986 in Russia.

C. Radioiodine in Air

In 1986, weekly air radioiodine (i.e., iodine-131) samples were collected by adsorption on charcoal cartridges from eight locations in the vicinity of SONGS (which served as indicator locations), and from Huntington Beach (which served as a control location). By the end of 1986, a total of 461 air cartridges had been analyzed for their iodine-131 content.

Iodine-131 was above detection limits in 36 of the 461 samples analyzed during 1986. See Table II-1 for a listing of radioiodine detected in the weekly air samples. The lower limit of detection of I-131 in these samples was 0.04 pCi/m3. More specifically, iodine-131 was seen in one air sample collected during March 18 through March 25 from the State Beach Park. The concentration of iodine-131 in this sample was 0.07 pCi/m3. Iodine was also found in 35 air samples collected from May 6 through June 3, 1986. During this time span, the concentrations of iodine-131 in the samples collected from the indicator locations ranged from 0.06 to 1.49 pCi/m3, averaging 0.328 pCi/m3. The concentrations of iodine-131 in the samples collected from the control location ranged from 0.12 to 0.74 pCi/m3, averaging 0.438 pCi/m3. See Figures 4, 5, and 6 for plots of radioiodine in air in 1986 for the City of San Clemente, Camp San Onofre, and the Mesa E.O.F.

The concentration of iodine-131 seen in the sample collected from the State Beach Park was greater than that seen at the control location, but did not exceed preliminary investigation levels (i.e., of twice the lower limit of detection of iodine-131 at the control location), and was less than ten percent of Technical Specification limits. The levels of radioiodine found in samples from both indicator and control locations during May and early June 1986 came close to exceeding, or actually did exceed the Nuclear Regulatory Commission reporting level of 0.9 pCi/m^3.

Most of the levels measured in samples collected from the indicator locations did not exceed preliminary investigation levels (i.e., twice the level measured at the control location) established by Edison. Due to the observed concurrent rise at the control locations, it appears that the radiation levels seen at the indicator and control locations were attributable to a source other than San Onofre. The most likely source of this activity is fallout from the Chernobyl nuclear power plant accident that occurred on April 26, 1986. This conclusion is also reasonable considering that radioiodine levels were, with one exception, below detection limits throughout 1986 in air samples collected near SONGS. Because the activity was not attributed to SONGS operations, a special report was not submitted to the Nuclear Regulatory Commission.

TABLE II-1

1986 WEEKLY RADIOIODINE IN AIR*
SONGS UNITS 1, 2, AND 3

Date	Location**									
	1	2	3	4	5	6	9	10	11	12
1/7	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	
1/14	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	
1/21	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	
1/28	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	
2/4	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	
2/11	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	
2/18	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	
2/25	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	
3/4	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	
3/11	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	
3/18	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	
3/25	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	0.07	<LLD	<LLD	
4/1	<LLD	<LLD	<LLD		<LLD	<LLD	<LLD	<LLD	<LLD	
4/8	<LLD	<LLD	<LLD		<LLD	<LLD	<LLD	<LLD	<LLD	
4/15	<LLD	<LLD	<LLD		<LLD	<LLD	<LLD	<LLD	<LLD	
4/22	<LLD	<LLD	<LLD		<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
4/29	<LLD	<LLD	<LLD		<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
5/6	<LLD	<LLD	<LLD		<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
5/13	0.91	0.15	0.74		0.34	0.51	0.19	0.07	0.07	0.20
5/20	0.41	1.03	0.62		1.49	0.61	0.34	0.35	0.47	0.55
5/27	0.11	0.39	0.27		0.13	0.30	0.12	0.44	0.09	0.27
6/3	0.08	0.09	0.12		0.06	<LLD	0.10	0.12	0.09	0.09
6/10	<LLD	<LLD	<LLD		<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
6/17	<LLD	<LLD	<LLD		<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
6/24	<LLD	<LLD	<LLD		<LLD	<LLD	<LLD	<LLD	<LLD	<LLD

Note:
* Concentrations listed are in units of pCi/m^3
<LLD - less than the lower limit of detection ($0.04\ pCi/m^3$)
** Location 1 - City of San Clemente; location 2 - Camp San Onofre; location 3 - Huntington Beach; location 5 - Units 2/3 Switchyard; location 6 - SONGS Meteorological Tower; location 9 - State Beach Park; location 10 - Bluff; location 11 - Mesa E.O.F.; location 12 - SONGS Evaporation Pond

TABLE II-1 (Continued)

1986 WEEKLY RADIOIODINE IN AIR*
SONGS UNITS 1, 2, AND 3

Date	Location** 1	2	3	4	5	6	9	10	11	12
7/1	<LLD	<LLD	<LLD		<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
7/8	<LLD	<LLD	<LLD		<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
7/15	<LLD	<LLD	<LLD		<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
7/22	<LLD	<LLD	<LLD		<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
7/29	<LLD	<LLD	<LLD		<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
8/5	<LLD	<LLD	<LLD		<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
8/12	<LLD	<LLD	<LLD		<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
8/19	<LLD	<LLD	<LLD		<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
8/26	<LLD	<LLD	<LLD		<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
9/2	<LLD	<LLD	<LLD		<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
9/9	<LLD	<LLD	<LLD		<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
9/16	<LLD	<LLD	<LLD		<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
9/23	<LLD	<LLD	<LLD		<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
9/30	<LLD	<LLD	<LLD		<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
10/7	<LLD	<LLD	<LLD		<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
10/14	<LLD	<LLD	<LLD		<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
10/21	<LLD	<LLD	<LLD		<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
10/28	<LLD	<LLD	<LLD		<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
11/4	<LLD	<LLD	<LLD		<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
11/11	<LLD	<LLD	<LLD		<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
11/18	<LLD	<LLD	<LLD		<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
11/25	<LLD	<LLD	<LLD		<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
12/2	<LLD	<LLD	<LLD		<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
12/9	<LLD	<LLD	<LLD		<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
12/16	<LLD	<LLD	<LLD		<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
12/23	<LLD	<LLD	<LLD		<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
12/30	<LLD	<LLD	<LLD		<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Total	1.510	1.660	1.750	0.000	2.020	1.420	0.820	0.980	0.720	1.110
# Samples	51	52	52	12	52	52	52	50	51	37
Average	0.030	0.032	0.034	0.000	0.039	0.027	0.016	0.020	0.014	0.030

Note:
* Concentrations listed are in units of pCi/m^3
<LLD - less than the lower limit of detection ($0.04\ pCi/m^3$)
** Location 1 - City of San Clemente; location 2 - Camp San Onofre; location 3 - Huntington Beach; location 5 - Units 2/3 Switchyard; location 6 - SONGS Meteorological Tower; location 9 - State Beach Park; location 10 - Bluff; location 11 - Mesa E.O.F.; location 12 - SONGS Evaporation Pond

D. Drinking Water

In 1986, drinking water samples were collected on a monthly basis from two indicator locations and from a control location situated in Huntington Beach. Upon collection, the samples were analyzed for tritium as well as for 12 naturally-occurring and SONGS-related radionuclides. Afterwards, the samples were filtered so that the suspended solids and filtrate could be analyzed separately for gross alpha and gross beta activity. Samples from each location were also composited quarterly, and filtered in the same manner. In each instance, the suspended solids were analyzed for gross beta concentrations, and the filtrates were analyzed for gross beta activity and for tritium.

Part A. Monthly Drinking Water Results

Unfiltered Samples

No gamma-emitting radionuclides or tritium were detected in any of the samples.

Drinking Water Solids

Gross alpha activity was not detected in the suspended solids from the Tri-Cities Municipal Water District Reservoir samples, but was found in the solid residue of 10 samples collected from the San Clemente Golf Course. Gross alpha activity in the samples ranged from 0.5 to 3.3 pCi/l, averaging 1.4 pCi/l. Gross alpha activity was also detected in one sample collected from the control location. The concentration of gross alpha activity in this sample was 0.2 pCi/l.

Gross beta activity was found in suspended solids from each sampling location. Gross beta activity was seen in solids of 22 out of 24 samples collected from the Tri-Cities Municipal Water District Reservoir and the San Clemente Golf Course. Gross beta activity in these samples ranged from 0.3 to 28 pCi/l of water, averaging 3.3 pCi/l of water. Gross beta activity was also seen in the solids of six samples collected from Huntington Beach. Gross beta activity in these samples ranged from 0.2 to 0.4 pCi/l of water, averaging .28 pCi/l of water.

Drinking Water Filtrate

Gross alpha activity was not found in any of the samples collected from Tri-Cities Municipal Water District Reservoir or from Huntington Beach. Gross alpha activity was detected, however, in two samples collected from the San Clemente Golf Course Well during the months of June and July. Gross alpha activity in these samples was determined to be 6 and 10 pCi/l, respectively.

Gross beta activity, however, was found in each sample. Gross beta activity in the filtrate from Tri-Cities Municipal Water District Reservoir and the San Clemente Golf Course Well ranged from 6 to 24 pCi/l, averaging 13.8 pCi/l. Gross beta activity in the samples collected from Huntington Beach ranged from 6 to 13 pCi/l, averaging 8 pCi/l.

Part B. Quarterly Drinking Water Composite Results

Drinking Water Solids

Gross alpha activity was not detected in the composite samples from the Tri-Cities Municipal Water District Reservoir, but was found in all four quarterly composites from the San Clemente Golf Course Well. Gross alpha activity in these samples ranged from 0.7 to 1.2 pCi/l, averaging 1.1 pCi/l. Gross alpha activity was not detected in composite samples from Huntington Beach.

Gross beta activity was found in samples from each sampling location. Gross beta activity was seen in all four quarterly composite samples collected from the Tri-Cities Municipal Water District Reservoir and the San Clemente Golf Course Well. Gross beta activity in these samples ranged from 0.4 to 10.1 pCi/l of water, averaging 3.3 pCi/l. Gross beta activity was also found in the third quarter composite sample from Huntington Beach. The measured gross beta activity in this sample was 0.3 pCi/l.

Drinking Water Filtrate

Gross alpha activity was not found in the quarterly composite samples collected from Tri-Cities Municipal Water District Reservoir or from Huntington Beach. Gross alpha activity was detected, however, in the second quarter composite sample collected from the San Clemente Golf Course Well. Gross alpha activity in this sample was determined to be 7 pCi/l.

Gross beta activity was seen in each quarterly composite sample. Gross beta activity in the composite samples from Tri-Cities Municipal Water District Reservoir and the San Clemente Golf Course Well ranged from 9 to 20 pCi/l, averaging 14 pCi/l. Gross beta activity in the samples collected from Huntington Beach ranged from 7 to 12 pCi/l, averaging 9 pCi/l.

Tritium was not detected in any of the quarterly composite samples.

Conclusions

No gamma-emitting radionuclides or tritium were found in the monthly drinking water samples or in the quarterly composite samples. Gross alpha and gross beta activity were, however, seen in a number of samples collected throughout 1986. In examining the data, there is no indication that gross alpha or gross beta activity is accumulating in either drinking walter filtrate or the drinking water solids. In addition, no reporting limits have been established by the Nuclear Regulatory Commission because of the negligible impact of environmental levels of gross alpha and gross beta activity in drinking water on members of the public. The impact of SONGS operations, then, on the environment and on the public has been negligible.

E. Local Crops

Representative fleshy crops were collected semiannually in 1986 from farms in the San Clemente and San Mateo Canyons (which served as the indicator locations), and from a garden situated SSE Oceanside (which served as the control location). Leafy vegetables were not collected due to their unavailability. After collection, the edible portion of the samples was analyzed quantitatively for 12 gamma-emitting radionuclides, as well as for tritium and radiostrontium by beta counting. The results of the analyses are summarized (below) based on "as received" wet sample weights.

Cucumbers, corn, tomatoes, and cauliflower were collected from the San Clemente and San Mateo Canyons. Upon analysis, potassium-40 was the only radionuclide detected in samples. The concentration of potassium-40 in the samples ranged from 1.08 to 15.4 pCi/g, averaging 5.15 pCi/g.

Two sets of tomatoes and kale were collected from the control location. Upon analysis, three radionuclides were detected in the samples, namely: potassium-40, cesium-137, and strontium-90. Potassium-40 was detected in each sample. The concentration of potassium-40 in the samples ranged from 1.17 to 2.8 pCi/g, averaging 2.04 pCi/g. Cesium-137 was detected in tomatoes and kale collected in June. The concentration of cesium-137 in these samples was 0.010 and 0.0037 pCi/g, respectively. These concentrations were verified by radiochemical analysis. Finally, strontium-90 was detected in the kale samples. The concentrations of strontium-90 were 0.010, and 0.011 pCi/g in the samples collected in June and November, respectively.

No Station-related radionuclides were detected in the samples collected from the San Clemente and San Mateo Canyons, indicating that SONGS operations had a negligible impact on this environmental medium. The presence of strontium-90 and cesium-137 in crops collected from the control location may be attributable to nuclear atmospheric weapons tests that occurred prior to and during 1980, the eruption of Mount St. Helens in 1980, and the Chernobyl nuclear power plant accident in 1986.

F. Soil

To determine if there is evidence of a build-up of radionuclides in the land near SONGS, soil samples were collected from the Visitor's Center (East Site Boundary), Old Route 101, Basilone Road, Camp San Onofre (which served as indicator locations in the vicinity of SONGS), and from Huntington Beach which served as a control location. Surface soil was collected from all indicator and control locations. Soil samples taken at depths of 3, 6, 9, and 12 inches were also collected from Old Route 101 and Huntington Beach in accordance with HASL-300 procedures.

After collection, each soil sample was analyzed for 12 naturally-occurring and SONGS-related radionuclides via gamma spectral analysis, and for radiostrontium by beta counting. The analyses indicated that potassium-40, cesium-137, and strontium-90 were present in detectable quantities in one or more of the samples. The findings are summarized below in terms of dry sample weights.

Surface Soil Sample Results

Several radionuclides were detected in surface soil collected from the indicator and control locations. Potassium-40 was detected in each sample. The concentrations of potassium-40 in the samples from the indicator locations ranged from 5.8 to 17.4 pCi/g, averaging 13.2 pCi/g of sample. The concentration of potassium-40 in the sample from the control location was 18.0 pCi/g of sample.

Cesium-137 was found in samples collected from Old Route 101 and from Camp San Onofre. The concentrations of cesium-137 in these samples were 0.03 and 0.11 pCi/g, respectively. Cesium-137, however, was not found in the sample collected from the control location.

Finally, strontium-90 was detected in the samples collected from the Visitor's Center, Old Route 101, Camp San Onofre, and in the sample collected from Huntington Beach. The concentrations of cesium-137 in the samples from the indicator locations were 0.04, 0.02, and 0.03 pCi/g, in that order. The concentration of strontium-90 in the sample from Huntington Beach was 0.02 pCi/g of sample.

Soil Profile Analysis

Potassium-40, cesium-137, and strontium-90 were found in varying amounts in the soil samples taken at depths of 3, 6, 9, and 12 inches at Old Route 101 and in Huntington Beach.

Potassium-40 was detected in all of the samples. The concentration of potassium-40 in the samples collected from Old Route 101 at the surface, and at depths of 3, 6, 9, and 12 inches were 5.8, 5.3, 6.2, 5.8, and 5.8 pCi/g of sample, respectively. The concentrations of potassium-40 in the samples collected from Huntington Beach at the surface, and at depths of 3, 6, 9, and 12 inches were 18, 18, 17.1, 16.9, and 16.9 pCi/g, in that order.

Cesium-137 was detected in two samples collected from Old Route 101 at the surface of the soil, and at a depth of 3 inches. The concentrations of cesium-137 in these samples were 0.03 and 0.18 pCi/g, respectively. Cesium-137 was not detected in the samples collected from Old Route 101 at depths of 6, 9, and 12 inches. Cesium-137 was also detected in the soil samples taken at depths of 3, 6 and 9 inches from Huntington Beach. The concentrations of cesium-137 in these samples were 0.07, 0.06, and 0.06 pCi/g, respectively. Cesium-137, however, was not found in the surface soil sample, or the sample collected at a depth of 12 inches from Huntington Beach. The lower limit of detection of cesium-137 in soil is 0.05 pCi/g.

Finally, strontium-90 was detected in several samples collected from Old Route 101 and from Huntington Beach. Strontium-90 was found in samples collected from surface soil, and at depths of 3 and 6 inches from Old Route 101 at concentrations of 0.02, 0.05, and 0.02 pCi/g, in that order. Strontium-90, however, was not detected in samples collected at depths of 9 and 12 inches. Strontium-90 was detected in samples collected from Huntington Beach from the surface soil, and at depths of 3, 6, and 9 inches all at concentrations of 0.02 pCi/g. Strontium-90, however, was not detected in the sample collected from Huntington Beach at a depth of 12 inches.

Conclusions

Several radionuclides were found in surface soil samples collected near SONGS, and from Huntington Beach. They include potassium-40, cesium-137, and strontium-90. The potassium-40 levels vary between sampling locations. This is a naturally-occurring phenomenon that is not related to SONGS operations. To assess the importance of detecting strontium-90 in the surface soil samples, data collected from the indicator locations over a period of six years were compared to similar data collected from Huntington Beach. (See Table E-1.) These data indicate that the concentrations of each of these radionuclides seen at both indicator and control locations are similar. Because of this, the activity can be attributed to atmospheric nuclear weapons tests and not SONGS operations.

Potassium-40, cesium-137, and strontium-90 were also found in soil profile analyses conducted in 1986. Because only one profile analysis has been conducted to date on samples from the indicator and control locations, it is not possible to draw any conclusions concerning potential radionuclide accumulation or migration in the soil samples.

G. Shoreline Sediment (Sand)

Beach sand was collected semiannually in 1986 from three indicator locations, and from a control location situated in Newport Beach. After collection, the samples were analyzed for 19 different Station-related and naturally-occurring radionuclides. The results of the analyses are summarized in Table II-2 in terms of "as received" wet sample weights.

In 1986, three radionuclides were detected in shoreline sediment samples. They include potassium-40, radium-226, and thorium-228. All three are naturally-occurring (i.e., non-SONGS related) radionuclides. The variation of the concentrations of these radionuclides in the shoreline sediment samples is considered to be characteristic of this environmental medium.

Because SONGS-related radionuclides were not seen in the shoreline sediment samples, the impact of SONGS operations on shoreline sediment and the public is considered to be negligible.

TABLE II-2

CONCENTRATIONS OF RADIONUCLIDES*
DETECTED IN SHORELINE SEDIMENT (SAND)
IN 1986

Sample Location	Collection Date	K-40	Ra-226	Th-228
0.5 miles S. of Unit 1	4/11/86	12.9	0.17	0.14
	9/17/86	14.3	0.19	0.20
San Onofre Surfing Beach	4/11/86	13.2	0.37	0.39
	9/17/86	16.6	0.12	0.14
S. San Onofre State Beach	4/11/86	15.4	0.14	0.12
	9/17/86	12.9	0.15	0.14
Newport Beach	4/11/86	17.8	0.37	0.99
	9/17/86	17.5	0.24	0.45

* Concentrations listed are in units of pCi/g, wet weight

H. Ocean Water

In 1986, ocean water samples were collected on a monthly basis in the vicinity of each of the Station discharge outfalls (which served as the indicator locations), and from Newport Beach (which served as the control location). Upon collection, each sample was analyzed for 19 naturally-occurring and Station-related, gamma-emitting radionuclides. Every other month, samples were also analyzed for gross beta activity. Finally, samples composited quarterly were analyzed for tritium.

Throughout 1986, potassium-40 was the only gamma-emitting radionuclide detected in the monthly gamma spectral analyses of samples from both the indicator and the control locations. Potassium-40 was detected in each sample. The concentrations of potassium-40 in the samples from the indicator locations ranged from 290 to 350 pCi/l, averaging 316 pCi/l. The concentrations of potassium-40 in the samples from the control location ranged from 290 to 370 pCi/l, averaging 323 pCi/l.

Gross beta activity was detected in each bimonthly ocean water sample. The concentrations of gross beta activity in the ocean water collected from the indicator locations ranged from 500 to 1200 pCi/l, averaging 822 pCi/l. The concentrations of gross beta activity in the ocean water collected from the control location ranged from 700 to 1000 pCi/l, averaging 850 pCi/l. After subtracting the contribution of potassium-40 to the gross beta activity, the concentrations of gross beta activity in the ocean water collected from the indicator locations ranged from below detectability to 14 pCi/l, averaging 6 pCi/l. The concentrations of gross beta activity in the ocean water collected from the control location ranged from below detectability to 9 pCi/l, averaging 5 pCi/l. Using these data, it was determined that potassium-40 accounted for at least 99 percent of the gross beta activity detected in each of the samples.

Tritium was detected in the third quarter composite sample obtained from the SONGS Unit 1 outfall. The concentration of tritium in this sample was 2200 pCi/l.

Virtually all of the observed radioactivity in each of the samples can be attributed to naturally-occurring potassium-40. The variation of potassium-40 in ocean water is considered characteristic of this environmental medium. The concentration of tritium measured in the third quarter composite ocean water sample was 11 percent of the reporting limit to the Nuclear Regulatory Commission. These data indicate that SONGS operations had a negligible impact on this environmental medium.

I. Non-Migratory Marine Species

Part I. Analysis of the Flesh Portion of the Marine Animals

During 1986, non-migratory marine species were collected near SONGS to determine the amount of radioactivity that could be consumed by man or in the food chain to man. To determine potential doses to the public, two species of adult fish, crustacea and mollusks, were collected on a quarterly basis at the SONGS Unit 1 outfall, at the SONGS Unit 2/3 outfall and from Newport Beach. Species collected at each of the locations in 1986 are listed in parentheses at the beginning of each summary description (below). Upon collection, the flesh portion of each sample type was analyzed for three naturally-occurring radionuclides, for 16 gamma-emitting Station-related radionuclides, and for aqueous and bound tritium. The results were subsequently reported to Edison in terms of both wet and dry sample weights. Because results based on a wet sample weight are most useful for calculating doses, the results of sample analyses are summarized below in terms of "as received" wet sample weights.

Results from the Indicator Locations

SONGS Unit 1, Fish (Sheephead):
Potassium-40 was the only naturally-occurring radionuclide detected in the flesh portion of the samples. The concentrations of potassium-40 ranged from 2.1 to 3.2 pCi/g of sample, averaging 2.6 pCi/g of sample.

Plant-related radionuclides detected in flesh portion of the sheephead included cobalt-58, cobalt-60, and cesium-137. Cobalt-58 was observed in samples from the first and second quarters both at concentrations of 0.015 pCi/g. Cobalt-60 was also detected in samples from the first and second quarters at concentrations of 0.027 and 0.046 pCi/g, in that order. Finally, cesium-137 was detected in samples collected throughout the year. The concentrations of cesium-137 ranged from 0.005 to 0.035 pCi/g, averaging 0.017 pCi/g.

Aqueous and bound tritium were not detected in the flesh portion of the samples.

SONGS Unit 1, Fish (Black Perch):
Upon analysis, potassium-40 was the only naturally-occurring radionuclide detected in the flesh of black perch. Potassium-40 was seen in samples collected throughout 1986. The concentrations of potassium-40 ranged from 2.3 to 2.7 pCi/g, averaging 2.5 pCi/g.

Plant-related radionuclides detected in the flesh of black perch included cobalt-58, cobalt-60, and cesium-137. Cobalt-58 was detected in a sample collected during the second quarter. The concentration of cobalt-58 in the sample was 0.009 pCi/g. Cobalt-60 was detected in each of the

samples. The concentrations of cobalt-60 in the sample ranged from 0.002 to 0.0120 pCi/g, averaging 0.0066 pCi/g. Likewise, cesium-137 was detected in each of the samples. The concentrations of cesium-137 ranged from 0.0051 to 0.009 pCi/g, averaging 0.0071 pCi/g.

Aqueous and bound tritium were not detected in the flesh of the black perch.

SONGS Unit 1, Crustacea (Spiny Lobster):
Potassium-40 was detected in the flesh portion of each sample. The concentrations of potassium-40 ranged from 1.9 to 3.0 pCi/g, averaging 2.6 pCi/g.

Plant-related radionuclides detected in the flesh of spiny lobster included cobalt-60, silver-110m, and cesium-137. Cobalt-60 was detected in samples collected during the first and second quarters. The measured concentrations of cobalt-60 were 0.014, and 0.008 pCi/g, respectively. Likewise, silver-110m was detected in samples collected during the first and second quarters. The measured concentrations of silver-110m were 0.008, and 0.0084 pCi/g, in that order. Cesium-137, on the other hand, was detected in each sample. The concentrations of cesium-137 ranged from 0.0040 to 0.0051 pCi/g, averaging 0.0045 pCi/g.

Aqueous and bound tritium were not detected in the flesh of the spiny lobster samples.

SONGS Unit 1, Mollusks (Bay Mussel and Sea Hare):
Three naturally-occurring radionuclides were detected in the flesh portion of the mollusks, namely: potassium-40, radium-226, and thorium-228. Potassium-40 was seen in each sample set. The concentrations of potassium-40 ranged from 0.67 to 0.99 pCi/g, averaging 0.86 pCi/g. Radium-226 was detected in samples collected during the third and fourth quarters. The measured concentrations of radium-226 were 0.005 and 0.040 pCi/g, Finally, thorium-228 was detected in samples collected during the third and fourth quarters at concentrations of 0.038 and 0.050 pCi/g, respectively.

Plant-related radionuclides detected in the flesh of the mollusks included cobalt-58, cobalt-60, and cesium-137. Cobalt-58 was detected in each sample. The concentrations of cobalt-58 ranged from 0.009 to 0.046 pCi/g, averaging 0.025 pCi/g. Likewise, cobalt-60 was detected in each set of samples. The concentrations of cobalt-60 ranged from 0.011 to 0.136 pCi/g, averaging 0.068 pCi/g. Cesium-137 was only detected in the sample collected during the first quarter. The concentration of cesium-137 in the sample was 0.0016 pCi/g.

Aqueous and bound tritium were not detected in the flesh portion of the mollusks.

SONGS Units 2/3, Fish (Sheephead):
Potassium-40 was the only naturally-occurring radionuclide detected in the flesh portion of the sheephead. The concentrations of potassium-40 in the samples ranged from 2.7 to 3.2 pCi/g, averaging 2.9 pCi/g.

Plant-related radionuclides detected in the flesh of sheephead included silver-110m and cesium-137. Silver-110m was observed in a fourth quarter sample at a concentration of 0.014 pCi/g. Cesium-137, on the other hand, was detected in each set of samples. The concentrations of cesium-137 ranged from 0.005 to 0.0104 pCi/g, averaging 0.0078 pCi/g.

Aqueous and bound tritium were not detected in the flesh of the sheephead.

SONGS Units 2/3, Fish (Black Perch):
Potassium-40 was seen in each sample set. The concentrations of potassium-40 in the flesh of the black perch ranged from 1.8 to 2.8 pCi/g, averaging 2.4 pCi/g.

Cesium-137 was the only plant-related radionuclide detected in the flesh of black perch. Cesium-137 was detected in samples collected during the second, third, and fourth quarters at concentrations of 0.0056, 0.0057, and 0.0056 pCi/g, in that order.

Aqueous and bound tritium were not detected in the flesh of black perch.

SONGS Units 2/3, Crustacea (Spiny Lobster):
Potassium-40 was detected in each sample set. The concentrations of potassium-40 in the flesh of spiny lobster ranged from 1.9 to 3.3 pCi/g, averaging 2.7 pCi/g.

Plant-related radionuclides detected in flesh of spiny lobster included cobalt-60, silver-110m, and cesium-137. These radionuclides were detected in each set of samples. The concentrations of cobalt-60 ranged from 0.002 to 0.010 pCi/g, averaging 0.007 pCi/g. The concentrations of silver-110m ranged from 0.013 to 0.018 pCi/g, averaging 0.015 pCi/g. Finally, the concentrations of cesium-137 ranged from 0.0037 to 0.012 pCi/g, averaging 0.0062 pCi/g.

Aqueous and bound tritium were not detected in the flesh portion of the spiny lobster.

SONGS Units 2/3, Mollusks (Bay Mussel):
Potassium-40 was seen in each set of quarterly samples. The concentrations of potassium-40 in the flesh of the bay mussel ranged from 0.70 to 1.2 pCi/g, averaging 0.85 pCi/g.

Plant-related radionuclides detected in flesh of the mollusks included cobalt-58 and cobalt-60. Cobalt-58 was detected in a sample collected during the second quarter. The concentration of cobalt-58 in this sample was 0.010 pCi/g. Cobalt-60, however, was detected in each sample. The concentrations of cobalt-60 ranged from 0.007 to 0.019 pCi/g, averaging 0.013 pCi/g.

Aqueous and bound tritium were not detected in the flesh of the mollusk samples.

Results from the Control Location

Newport Beach, Fish (Sheephead):
Potassium-40 was detected in each sample set. The concentrations of potassium-40 in the flesh of the sheephead ranged from 2.3 to 3.0 pCi/g, averaging 2.6 pCi/g.

Cesium-137 was the only plant-related radionuclide detected in the flesh of sheephead, and was detected in each set of samples. The concentrations of cesium-137 ranged from 0.0041 to 0.0053 pCi/g, averaging 0.0047 pCi/g.

Aqueous and bound tritium were not detected in the flesh of sheephead.

Newport Beach, Fish (Black Perch):
Potassium-40 seen in each set of samples. The concentrations of potassium-40 in the flesh of the black perch ranged from 2.0 to 2.5 pCi/g, averaging 2.3 pCi/g.

Cesium-137, the only plant-related radionuclide detected in flesh of the black perch, was detected in each set of samples. The concentrations of cesium-137 ranged from 0.0029 to 0.0073 pCi/g, averaging 0.0048 pCi/g.

Aqueous and bound tritium were not detected in the flesh portion of the black perch samples.

Newport Beach, Crustacea (Spiny Lobster):
Potassium-40 was detected in the flesh of each spiny lobster sample analyzed. The concentrations of potassium-40 ranged from 2.5 to 3.2 pCi/g, averaging 2.9 pCi/g.

Cesium-137, the only plant-related radionuclide detected in flesh portion of spiny lobster, was detected in each set of samples. The concentrations of cesium-137 ranged from 0.0027 to 0.0040 pCi/g, averaging 0.0034 pCi/g.

Aqueous and bound tritium were not detected in the flesh of the spiny lobster samples.

Newport Beach, Mollusks (Keyhole Limpet):
Potassium-40 was seen in each set of samples. The concentrations of potassium-40 in the flesh portion of the keyhole limpet ranged from 0.68 to 1.02 pCi/g, averaging 0.89 pCi/g.

Plant-related radionuclides detected in flesh of the mollusks included cobalt-60 and silver-110m. Cobalt-60 was detected in samples collected during the first and third quarters. The concentrations of cobalt-60 in these samples were 0.0021 and 0.0020 pCi/g, respectively. Silver-110m was detected in samples collected during the first and fourth quarters. The concentrations of silver-110m in the samples were 0.0071 and 0.0070 pCi/g, in that order.

Aqueous and bound tritium were not detected in the flesh of the mollusks.

Part II. Analysis of the Bone Portion of the Marine Animals

To determine if there is evidence of a build-up of radionuclides in the non-migratory marine species, the bone portion of each sample of marine species collected during 1986 was analyzed for three naturally-occurring radionuclides, for 16 gamma-emitting Station-related radionuclides, for aqueous and bound tritium, and for strontium-90. The results were subsequently reported to Edison in terms of both wet and dry sample weights. For consistency with Part I of this section, the results of sample analyses are summarized below in terms of "as received" wet sample weights.

Results from the Indicator Locations

SONGS Unit 1, Fish (Sheephead):
Potassium-40 was the only naturally-occurring radionuclide detected in the bone of the sheephead. The concentrations of potassium-40 ranged from 0.40 to 0.80 pCi/g, averaging 0.55 pCi/g.

One plant-related radionuclide, cobalt-60, was detected in one sample collected during the second quarter of 1986. The concentration of cobalt-60 in the bone portion of the sheephead was 0.020 pCi/g.

Strontium-90, aqueous tritium, and bound tritium were not detected in the bone of the sheephead samples.

SONGS Unit 1, Fish (Black Perch):
Potassium-40, a naturally-occurring radionuclide, was detected in flesh of black perch collected from the first, second, and third quarters at concentrations of 1.0, 0.8, and 0.7 pCi/g, in that order.

Plant-related gamma-emitting radionuclides, strontium-90, aqueous tritium, and bound tritium were not detected in the samples.

SONGS Unit 1, Crustacea (Spiny Lobster):
Potassium-40 was detected in the bone portion of each sample. The concentrations of potassium-40 ranged from 0.85 to 0.92 pCi/g, averaging 0.89 pCi/g.

Plant-related radionuclides detected in the bone of spiny lobster included cobalt-60 and silver-110m. Cobalt-60 was detected in samples collected during the first, second, and fourth quarters at concentrations of 0.017, 0.007, and 0.004 pCi/g, respectively. Silver-110m was detected in one sample collected during the second quarter. The concentration of silver-110m in this sample was 0.005 pCi/g.

Strontium-90, aqueous tritium, and bound tritium were not detected in the flesh portion of the spiny lobster.

SONGS Unit 1, Mollusks (Bay Mussel):
The results listed below correspond to bay mussel collected during the first, second, third and fourth quarters. Sea hare have no bones or shell.

Potassium-40 was observed in the shell of bay mussel collected during the first quarter of 1986. The concentration of potassium-40 in the sample was 0.15 pCi/g.

Plant-related gamma-emitting radionuclides, strontium-90, aqueous tritium, and bound tritium were not detected in the shell portion of the bay mussel.

SONGS Units 2/3, Fish (Sheephead):
Potassium-40 was the only naturally-occurring radionuclide detected in the bone of sheephead. The concentrations of potassium-40 ranged from 0.40 to 0.80 pCi/g, averaging 0.55 pCi/g.

Plant-related radionuclides, strontium-90, aqueous tritium, and bound tritium were not detected in the bone of the sheephead samples.

SONGS Units 2/3, Fish (Black Perch):
Potassium-40, a naturally-occurring radionuclide, was detected in bone of black perch collected from the first, second, and third quarters at concentrations of 1.0, 0.4, and 0.6 pCi/g, in that order.

Plant-related gamma-emitting radionuclides, strontium-90, aqueous tritium, and bound tritium were not detected in the bone portion of the black perch.

SONGS Units 2/3, Crustacea (Spiny Lobster):
Potassium-40 was detected in the bone of each sample of spiny lobster. The concentrations of potassium-40 ranged from 0.85 to 0.92 pCi/g, averaging 0.89 pCi/g.

Plant-related radionuclides detected in the bone of spiny lobster included cobalt-60 and silver-110m. Cobalt-60 was detected in samples collected during the first, second, and fourth quarters at concentrations of 0.017, 0.007, and 0.004 pCi/g, respectively. Silver-110m was detected in one sample collected during the second quarter. The concentration of silver-110m in this sample was 0.005 pCi/g.

Strontium-90, aqueous tritium, and bound tritium were not detected in the flesh portion of the spiny lobster.

SONGS Units 2/3, Mollusks (Bay Mussel):
The results listed below correspond to bay mussel collected during the first, second, third and fourth quarters. Sea hare have no bones or shell.

Potassium-40 was observed in the shell of bay mussel collected during the first quarter of 1986. The concentration of potassium-40 in the sample was 0.15 pCi/g.

Silver-110m, the only plant-related gamma-emitting radionuclide detected in the shell of the bay mussel, was observed in a sample collected during the fourth quarter of 1986.

Strontium-90, aqueous tritium, and bound tritium were not detected in the shell portion of the bay mussel.

Results from the Control Location

Newport Beach, Fish (Sheephead):
Potassium-40, the only naturally-occurring radionuclide detected in the bone of sheephead, was observed in samples from the second, third, and fourth quarters. The concentrations of potassium-40 in the bone of sheephead were 0.30, 0.40, and 0.60 pCi/g, respectively.

Plant-related radionuclides, strontium-90, aqueous tritium, and bound tritium were not detected in the bone of the sheephead samples.

Newport Beach, Fish (Black Perch):
Potassium-40, a naturally-occurring radionuclide, was detected in bone of black perch collected during the first quarter. The concentration of potassium-40 in the sample was 0.17 pCi/g.

Plant-related gamma-emitting radionuclides, strontium-90, aqueous tritium, and bound tritium were not detected in the bone portion of the black perch.

Newport Beach, Crustacea (Spiny Lobster):
Potassium-40 was detected in the bone portion of each sample of spiny lobster. The concentrations of potassium-40 ranged from 0.62 to 1.18 pCi/g, averaging 0.85 pCi/g.

Plant-related, gamma-emitting radionuclides, strontium-90, aqueous tritium, and bound tritium were not detected in the flesh portion of the spiny lobster.

Newport Beach, Mollusks (Keyhole Limpet):
Potassium-40 was observed in the shell of keyhole limpet collected during the first and fourth quarters of 1986. The concentrations of potassium-40 in the samples were 0.10 and 0.18 pCi/g, respectively.

Plant-related, gamma-emitting radionuclides, strontium-90, aqueous tritium, and bound tritium were not detected in the bone portion of the keyhole limpet.

Part III. Conclusions

Plant-related radionuclides often seen in minute quantities in the flesh portion of marine species collected near SONGS included cobalt-58, cobalt-60, and cesium-137. To determine whether or not these radionuclides are accumulating in the marine animals, concentrations of each of these radionuclides seen in sheephead (a fish), crustacea, and mollusks were plotted versus time from 1979 through 1986. See Figure 7-15. Although these concentrations were determined in marine species collected near the SONGS Unit 1 outfall, the concentrations should be representative of the entire area near SONGS. Trending of these data indicates that the concentrations of each of these radionuclides is greater than or equal to concentrations measured at the control location, but are not accumulating in the marine animals. The highest concentrations of cobalt-58, cobalt-60 and cesium-137 seen in the marine animals in 1986 were only 0.06, 0.84, and 1.8 percent of the reporting levels to the Nuclear Regulatory Commission.

No aqueous or bound tritium was found in the flesh of any of the marine species collected in 1986.

No strontium-90, aqueous tritium or bound tritium was found in the bone or shell portions of the marine species. Two radionuclides that were detected in a few crustacea and mollusk samples include cobalt-60 and silver-110m. There is no evidence that these radionuclides are accumulating in the bone (or shell) of these marine species. Because bone and/or shell is not ingested, no reporting limits have been established for SONGS by the Nuclear Regulatory Commission.

Based on these data, it was concluded that SONGS operations has had a detectable, but minimal impact on this environmental medium.

J. Kelp Sampling

Kelp was collected during May, June, and November 1986 from the San Onofre and San Mateo Kelp Beds, as well as from a kelp bed in Laguna Beach. No samples were collected from the Barn Kelp Bed due to its unharvestable condition. Upon collection, the samples were analyzed by gamma-spectral analysis for 19 different naturally-occurring and Station-related radionuclides. The samples were also analyzed for both aqueous and bound tritium. At the end of the year, no aqueous or bound tritium had been detected in the samples. Gamma-emitting radionuclides detected in the samples included potassium-40, iodine-131, and cesium-137. The results of these analyses are summarized below in terms of wet sample weights.

Naturally-occurring potassium-40 was detected in each sample. The concentrations of potassium-40 in the samples from the indicator locations ranged from 5.2 to 8.3 pCi/g, averaging 6.83 pCi/g. The concentrations of potassium-40 in the samples from the control location ranged from 5.3 to 7.3 pCi/g, averaging 6.5 pCi/g.

Iodine-131 was also detected in all but one kelp sample. The concentrations of iodine-131 in the samples from the indicator locations ranged from below detectability to 0.25 pCi/g. The average concentration of iodine-131 was 0.124 pCi/g. The concentrations of iodine-131 in samples collected from the control location ranged from 0.049 to 0.129 pCi/g, averaging 0.076 pCi/g.

Cesium-137 was detected in every sample collected from the indicator locations, and in three samples collected from the control location. The concentrations of cesium-137 in the samples from the indicator locations ranged from 0.0026 to 0.0057, averaging 0.0044 pCi/g. Cesium-137 was detected in samples during the first and third sample collections from the control location. The concentrations of cesium-137 in these samples were 0.0044 and 0.0034 pCi/g, in that order.

To determine if these radionuclides are accumulating in kelp with time, data were examined from 1981 through 1986. See Appendix E, Table E-5. The data indicate that the concentrations of potassium-40 at both indicator have remained commensurate, as anticipated. The frequency of detection and concentrations of iodine-131 and cesium-137 in kelp have increased, however, in the past few years. The amounts of the radionuclides, though, are still considered to be minute. Doses via the ingestion pathway to members of the public were not calculated because kelp near SONGS was not harvested commercially in 1986.

K. Ocean Bottom Sediments

To determine the amount of radioactivity in ocean bottom sediments in the vicinity of the Station in 1986, representative samples were collected semiannually near each of the Station discharge outfalls (which served as indicator locations), and from Newport Beach (which served as a control location). After collection, the samples were analyzed by gamma-spectral analysis for 19 naturally-occurring, and Station-related radionuclides. The results of these analyses are summarized in Table II-3 in terms of "as received" wet sample weights.

In 1986, four radionuclides were detected in ocean bottom sediment samples. They include potassium-40, radium-226, thorium-228 and cobalt-60. Potassium-40, radium-226, and thorium-228 are all naturally-occurring (i.e., non-Station related) radionuclides. The variation of the concentrations of these radionuclides in the ocean bottom sediment samples is considered to be characteristic of this environmental medium. Cobalt-60 was found in one sample collected East of the Unit 1 outfall in May 1986. The concentration of cobalt-60 in this sample was 0.06 pCi/g, wet weight.

Because only one SONGS-related radionuclide was seen in one sample, the impact of SONGS operations on ocean bottom sediments, and on the public is considered to be minimal.

TABLE II-3

CONCENTRATIONS OF RADIONUCLIDES*
DETECTED IN OCEAN BOTTOM SEDIMENTS
IN 1986

Sample Location	Collection Date	K-40	Ra-226	Th-228	Co-60
SONGS Unit 1 (E)	5/12/86	10.6	0.56	0.64	0.06
	11/7/86	11.1	0.54	0.70	<LLD
SONGS Unit 1 (W)	5/12/86	13.8	0.24	0.28	<LLD
	11/7/86	12.5	0.25	0.25	<LLD
SONGS Unit 2	5/12/86	15.2	0.16	0.12	<LLD
	11/5/86	12.4	0.29	0.40	<LLD
SONGS Unit 3	5/21/86	15.2	0.21	0.24	<LLD
	11/5/86	10.6	0.50	0.57	<LLD
Newport Beach	5/15/86	13.2	0.22	0.42	<LLD
	11/6/86	14.6	0.25	0.49	<LLD

* Concentrations listed are in units of pCi/g, wet weight.
Radionuclides not listed in the Table were at concentrations below detection limits (i.e., <LLD).

III. CONCLUSIONS

Levels of radioactivity in environmental media depend on many components, including the following: site release rates; meteorology; number, location, size and date of nuclear weapons testing; seasonal variability of fallout; soil conditions; local terrain and variability in the natural environment.

Radiological environmental data collected throughout 1986 have been evaluated to determine the impact, if any, of San Onofre operations on the surrounding environment. To accomplish this, several methods of evaluation were employed, namely:

(1) Compilation and verification of all data, as well as a determination of those data considered to be significantly greater than background levels, (i.e., 1.25 times background levels for TLD direct radiation doses, and twice background levels for radionuclide concentrations).

(2) Comparison of data (exceeding background levels) against reportability levels contained in the plant Technical Specifications.

(3) Examination of time-dependent variations of pertinent radioiostopes in selected environmental media throughout the year at both indicator and control locations.

(4) Comparison of radioactivity in various media in 1986 against the levels observed in pre-operational years.

(5) Historical trending of radionuclides in various media over the past six years.

In comparing these findings to the conservatively-defined limits of the facility operating licenses, it is concluded that the radiological environmental impact of San Onofre Units 1, 2 and 3 operations through 1986 has been minimal, and the resulting dose to man is negligible.

IV. REFERENCES

1. Land Use Census for SONGS Units 1, 2 and 3 Radiological Environmental Monitoring Program, 1986

2. ODCM, "Offsite Dose Calculation Manual for SONGS Units 2 and 3," 1986

3. ODCM, "Offsite Dose Calculation Manual for SONGS Unit 1," 1986

4. USNRC Draft Regulatory Guide 4.8, "Standard Format and Principal Content of Environmental Technical Specifications," December 1975

5. USNRC Regulatory Guide 4.13, "Performance, Testing and Procedural Specifications for Thermoluminescent Dosimetry - Environmental Applications," 1977

6. USNRC Regulatory Guide 4.15, "Quality Assurance for Radiological Monitoring Programs," Rev. 1, February 1979

7. SONGS Unit 1 Provisional Operating License, DPR-13, Sections 3.18 and 4.18, effective prior to January 1, 1985

8. SONGS Unit 2 Operating License NPF-10, Section 3/4.12.1

9. SONGS Unit 3 Operating License NPF-15, Section 3/4.12.1

APPENDIX A

SAMPLE TYPE AND SAMPLING LOCATION

TABLE A-1

RADIOLOGICAL ENVIRONMENTAL MONITORING SAMPLE LOCATIONS

	TYPE OF SAMPLE AND SAMPLING LOCATION	DISTANCE* (miles)	DIRECTION*
Direct Radiation			
1	City of San Clemente (SDG&E Offices)	5.6	NW
2	Camp San Mateo	3.5	N
3	Camp San Onofre	2.6	NE
4	Camp Horno	4.5	E
5	Camp Las Pulgas	8.5	ESE
6	Old Route 101 - East-Southeast	3.0	ESE
7	Old Route 101 - East-Southeast	0.5	ESE
8	Noncommissioned Officers Beach Club	1.2	NW
9	Basilone Road/I-5 Freeway Offramp	2.0	NW
10	Bluff	0.8	NW
11	El Camino Training Annex (formerly Visitors Center)	0.2	NNE
12	South Edge of Switchyard	0.2	NE
13	Site Boundary	0.13	SE
14	Huntington Beach Generating Station	37	NW
15	East-Southeast Site Boundary	0.2	ESE
16	East Site Boundary	0.5	E
17	Transit Dose	-	-
18	Transit Dose	-	-
19	San Clemente Highlands	5.0	NNW
20	San Clemente Pier	5.0	NW
21	Concordia Elementary School - San Clemente	3.5	NW
22	Coast Guard Station - San Mateo Point	2.7	WNW
23	San Clemente General Hospital	8.2	NW
24	San Clemente High School	6.0	NW

* Distance (miles) and Direction (sector) are measured relative to Units 2 and 3 midpoint. Direction is determined from degrees true north.

TABLE A-1 (Continued)

RADIOLOGICAL ENVIRONMENTAL MONITORING SAMPLE LOCATIONS

TYPE OF SAMPLE AND SAMPLING LOCATION		DISTANCE* (miles)	DIRECTION*
Direct Radiation (Continued)			
25	Convalescent Home - San Clemente	8.0	NW
26	Dana Hills High School	11.0	NW
27	U.S. Post Office - Dana Point	10.5	NW
28	Doheny Fire Station - Capistrano Beach	9.5	NW
29	San Juan Capistrano Fire Station	10.8	NW
30	Laguna Beach Fire Station	17.5	NW
31	Aurora Park Mission Viejo	18.6	NNW
32	Santa Ana Police Department	32.0	NW
33	Camp Talega	5.7	N
34	San Onofre School	1.7	NW
35	Range 312 (Marine Corps Base, Camp Pendleton)	4.7	NNE
36	Range 208C (Marine Corps Base, Camp Pendleton)	4.0	NE
37	Laguna Niguel Fire Station	13.5	NW
38	San Onofre State Beach Park	3.6	SE
39	Basilone Road Trailer Park	1.4	NNW
40	SCE Training Center - Mesa	0.8	NW
41	Old Route 101 - East	0.3	E
42	Horno Canyon	4.6	E
43	Edson Range (Marine Corps Base, Camp Pendleton)	10.6	SE
44	Fallbrook Fire Station	18.0	E
45	Interstate 5 Weigh Station	2.0	ESE
46	San Onofre State Beach Park	1.4	SE
47	Camp Las Flores	8.6	SE
48	Mainside (Marine Corps Base, Camp Pendleton)	15.0	ESE

* Distance (miles) and Direction (sector) are measured relative to Units 2 and 3 midpoint. Direction is determined from degrees true north.

TABLE A-1 (Continued)

RADIOLOGICAL ENVIRONMENTAL MONITORING SAMPLE LOCATIONS

	TYPE OF SAMPLE AND SAMPLING LOCATION	DISTANCE* (miles)	DIRECTION*
Direct Radiation (Continued)			
49	Camp Chappo	12.8	ESE
50	Oceanside Fire Station	15.5	SE
51	Carlsbad Fire Station	18.6	SE
52	Vista Fire Station	21	ESE
53	San Diego County Operations Center	45	SE
54	Escondido Fire Station	32	ESE
55	San Onofre State Beach (Unit 1)	0.2	W
56	San Onofre State Beach (Unit 1)	0.1	W
57	San Onofre State Beach (Unit 2)	0.1	SSW
58	San Onofre State Beach (Unit 3)	0.1	S
59	SONGS Meteorological Tower	0.3	NW
60	Transit Control Storage Area	-	-
61	Adjacent to Pressurized Ion Chamber No. 54**	0.6	NNE
62	Adjacent to Pressurized Ion Chamber No. 55**	0.7	NE
63	Adjacent to Pressurized Ion Chamber No. 56**	0.7	ENE
64	Adjacent to Pressurized Ion Chamber No. 57**	0.7	E
65	Adjacent to Pressurized Ion Chamber No. 58**	0.9	ESE
66	Adjacent to Pressurized Ion Chamber No. 59**	0.8	ESE
67	Adjacent to Pressurized Ion Chamber No. 52**	0.4	NW

* Distance (miles) and Direction (sector) are measured relative to Units 2 and 3 midpoint. Direction is determined from degrees true north.

** See Table A-2.

TABLE A-1 (Continued)

RADIOLOGICAL ENVIRONMENTAL MONITORING SAMPLE LOCATIONS

	TYPE OF SAMPLE AND SAMPLING LOCATION	DISTANCE* (miles)	DIRECTION*
Airborne			
1	City of San Clemente (City Hall)	5.5	NW
2	Camp San Onofre (Camp Pendleton)**	1.8	NE
3	Huntington Beach Generating Station	37.0	NW
5	Units 2 and 3 Switchyard**	0.13	ESE
6	SONGS Meteorological Tower**	0.3	NW
9	State Beach Park**	0.4	ESE
10	Bluff	0.5	WNW
11	Mesa EOF	0.5	NNW
12	SONGS Evaporation Pond	0.4	NW
Soil Samples			
1	Camp San Onofre	2.5	NE
2	Old Route 101 - Southeast	3.0	SE
3	Basilone Road/I-5 Freeway Offramp	2.0	NW
4	Huntington Beach Generating Station	37.0	NW
5	East Site Boundary (visitor's center)	0.2	NNW
Ocean Water			
A	Station Discharge Outfall - Unit 1	0.5	SW
B	Outfall - Unit 2	0.7	SW
C	Outfall - Unit 3	0.7	SW
D	Newport Beach	30.0	NW

* Distance (miles) and Direction (sector) are measured relative to Units 2 and 3 midpoint. Direction is determined from degrees true north.

** Not required by Technical Specifications.

TABLE A-1 (Continued)

RADIOLOGICAL ENVIRONMENTAL MONITORING SAMPLE LOCATIONS

TYPE OF SAMPLE AND SAMPLING LOCATION		DISTANCE* (miles)	DIRECTION*
Drinking Water			
1	Tri-Cities Municipal Water District Reservoir	8.7	NW
2	San Clemente Golf Course Well	3.5	NNW
3	Huntington Beach	37.0	NW
Shoreline Sediment (Beach Sand)			
1	San Onofre State Beach	0.6	SE
2	San Onofre Surfing Beach	0.9	NW
3	San Onofre State Beach	3.5	SE
4	Newport Beach (North End)	30.0	NW
Local Crops			
1	San Mateo Canyon, San Clemente Canyon	2.6	NW
2	Southeast of Oceanside	22.0	SE

* Distance (miles) and Direction (sector) are measured relative to Units 2 and 3 midpoint. Direction is determined from degrees true north.

TABLE A-1 (Continued)

RADIOLOGICAL ENVIRONMENTAL MONITORING SAMPLE LOCATIONS

TYPE OF SAMPLE AND SAMPLING LOCATION		DISTANCE* (miles)	DIRECTION*
Non-Migratory Marine Animals			
A	Unit 1 Outfall	0.6	WSW
B	Units 2 and 3 Outfall	0.7	SSW
C	Newport Beach	30.0	NW
Kelp			
A	San Onofre Kelp Bed	1.5	S
B	San Mateo Kelp Bed	3.5	WNW
C	Barn Kelp Bed	6.6	SSE
D	Newport Beach	30.0	NW
Ocean Bottom Sediments			
A	Unit 1 Outfall	0.5	W
B	Unit 1 Outfall	0.6	W
C	Unit 2 Outfall	0.8	SSW
D	Unit 3 Outfall	0.9	S
E	Newport Beach	30.0	NW

* Distance (miles) and Direction (sector) are measured relative to Units 2 and 3 midpoint. Direction is determined from degrees true north.

TABLE A-2

PIC-RADIOLOGICAL ENVIRONMENTAL MONITORING LOCATIONS - SONGS 2/3

PRESSURIZED ION CHAMBERS		THETA (DEGREES)	DISTANCE* METERS/MILES		DIRECTION/SECTOR*	
S1	San Onofre Beach	298°	1070	0.665	WNW	P
S2	SONGS Evaporation Pond	313°	890	0.553	NW	Q
S3	Japanese Mesa	340°	1150	0.715	NNW	R
S4	MCB - Camp Pendleton	3°	1120	0.696	N	A
S5	MCB - Camp Pendleton	19°	1050	0.653	NNE	B
S6	MCB - Camp Pendleton	46°	940	0.584	NE	C
S7	MCB - Camp Pendleton	70°	870	0.541	ENE	D
S8	MCB - Camp Pendleton	98°	1120	0.696	E	E
S9	San Onofre State Beach	121°	940	0.584	ESE	F

* Distance (meters/miles) and Direction (sector) are measured relative to Units 2 and 3 midpoint. Theta direction is determined from degrees true north.

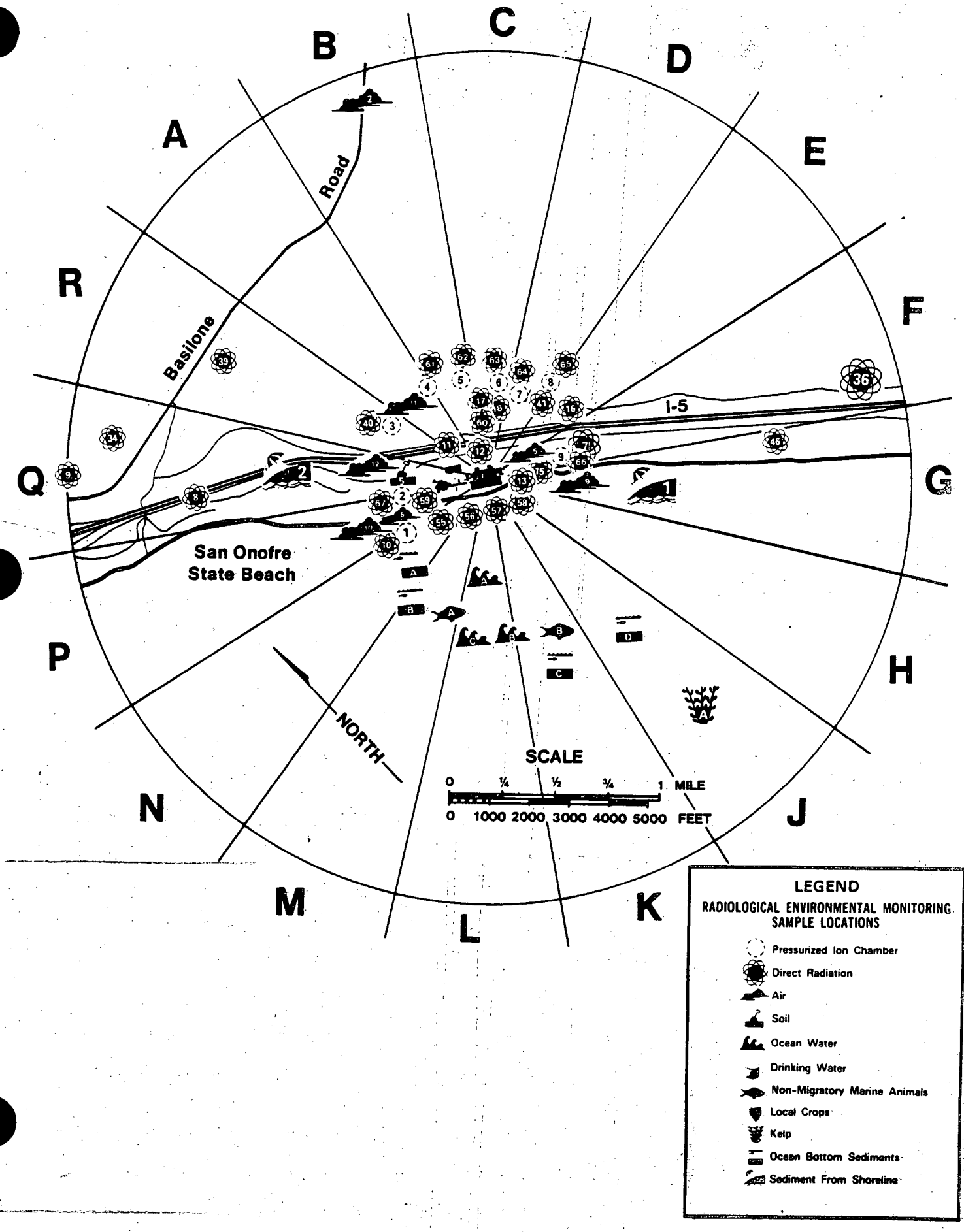
TABLE A-3

SECTOR AND DIRECTION DESIGNATION FOR RADIOLOGICAL ENVIRONMENTAL MONITORING SAMPLE LOCATION MAP

DEGREES TRUE NORTH FROM SONGS 2 AND 3 MID-POINT			NOMENCLATURE	
Sector Limit	Center Line	Sector Limit	22.5° Sector*	Direction
348.75	0 & 360	11.25	A	N
11.25	22.5	33.75	B	NNE
33.75	45.0	56.25	C	NE
56.25	67.5	78.75	D	ENE
78.75	90.0	101.25	E	E
101.25	112.0	123.75	F	ESE
123.75	135.0	146.25	G	SE
146.25	157.0	168.75	H	SSE
168.75	180.0	191.25	J	S
191.25	202.5	213.75	K	SSW
213.75	225.0	236.25	L	SW
236.25	247.5	258.75	M	WSW
258.75	270.0	281.15	N	W
281.25	292.5	303.75	P	WNW
303.75	315.0	326.25	Q	NW
326.25	337.5	348.75	R	NNW

* Distance (miles) and Direction (sector) are measured relative to Units 2 and 3 midpoint. Direction is determined from degrees true north.

Figure A-3
Revision 2 March 19, 1986



APPENDIX B

SUMMARY OF 1986 RADIOLOGICAL ENVIRONMENTAL DATA

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ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY
SAN ONOFRE NUCLEAR GENERATING STATION

Docket No. 50-361
San Diego County, California

Reporting period: January 01, 1986 to December 31, 1986

Medium or Pathway Sampled (Unit of Measurement)	Type and Total Number of Analyses Performed	Lower Limit of Detection (LLD)	All Indicator Locations Mean(f) Range	Location With Highest Annual Mean Name, Distance and Direction	Mean(f) Range	Control Locations Mean(f) Range	Number of Nonroutine Reported Measurements
Table 1a Direct Radiation Quarterly Composite (milliram)							
	Gamma Exposure 236	5.0000	19.15(202/232) (9.200-35.400)	San Onofre State Beach (Unit 1) 0.2 mi. W	24.8(4/ 4) (23.000-26.700)	21.867(3/ 4) (21.200-22.700)	0

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Table 1b Direct Radiation Annual Composite (millirem)							
	Gamma Exposure 59	5.0000	86.863(57/ 58) (41.100- 123.3)	San Onofre State Beach (Unit 1) 0.2 mi. W	123.3(1/ 1) (123.3- 123.3)	97.3(1/ 1) (97.300-97.300)	0

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Table 2 Airborne Weekly Composite (pCi/cu. m)							
	Gross Beta 520	0.0010	0.0466(409/468) (0.003- 0.890)	SONGS Evaporation Pond 0.4 mi. NW	0.0596(37/ 52) (0.014- 0.670)	0.0457(52/ 52) (0.010- 0.720)	0

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Table 3 Airborne Weekly Composite (pCi/cu. m)							
	I-131 520	0.0400	0.3200(32/468) (0.060- 1.490)	Units 2/3 Switchyard 0.13 mi. ESE	0.5050(4/ 52) (0.060- 1.490)	0.4375(4/ 52) (0.120- 0.740)	0

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Table 4a Airborne Quarterly Composite (pCi/cu. m)							
	Ag-110m 36	0.0020	<LLD (0/ 32)	ALL <LLD	-----	<LLD (0/ 4)	0
	Be-7 36	0.0060	0.1122(32/ 32) (0.080- 0.167)	SONGS Evaporation Pond 0.4 mi. NW	0.1340(3/ 3) (0.115- 0.167)	0.0992(4/ 4) (0.080- 0.138)	0
	Ce-141 36	0.0040	<LLD (0/ 32)	ALL <LLD	-----	<LLD (0/ 4)	0
	Ce-144 36	0.0050	<LLD (0/ 32)	ALL <LLD	-----	<LLD (0/ 4)	0
	Co-58 36	0.0020	<LLD (0/ 32)	ALL <LLD	-----	<LLD (0/ 4)	0
	Co-60 36	0.0020	<LLD (0/ 32)	ALL <LLD	-----	<LLD (0/ 4)	0
	Cs-134 36	0.0010	0.0095(8/ 32) (0.007- 0.013)	SONGS Evaporation Pond 0.4 mi. NW	0.0130(1/ 3) (0.013- 0.013)	0.0090(1/ 4) (0.009- 0.009)	0
	Cs-137 36	0.0010	0.0197(8/ 32) (0.015- 0.026)	SONGS Evaporation Pond 0.4 mi. NW	0.0260(1/ 3) (0.026- 0.026)	0.0170(1/ 4) (0.017- 0.017)	0
	K-40 36	0.0200	<LLD (0/ 32)	ALL <LLD	-----	<LLD (0/ 4)	0

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Table 4a Airborne Quarterly Composite (pCi/cu. m)							
	Ru-103	36	0.0040	0.0156(8/ 32) (0.010- 0.019)	Mesa E.O.F. 0.5 mi. NNW	0.0190(1/ 4) (0.019- 0.019)	0.0140(1/ 4) (0.014- 0.014)	0
	Zr(Nb)-95	36	0.0040	<LLD (0/ 32)	ALL <LLD	-----	<LLD (0/ 4)	0

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Table 4c Airborne Quarterly Composite (pCi/cu. m)							
	Gross Alpha 40	0.0003	0.0022(8/ 36) (0.002- 0.003)	SONGS Evaporation Pond 0.4 mi. NW	0.0025(2/ 4) (0.002- 0.003)	0.0020(1/ 4) (0.002- 0.002)	0
	Sr-90 40	0.0010	<LLD (0/ 36)	ALL <LLD	-----	<LLD (0/ 4)	0

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Table 5 Ocean Water Monthly Composite (pCi/l)							
Ag-110m	48	10	<LLD (0/ 36)	ALL <LLD	-----	<LLD (0/ 12)	0
Ce-141	48	15	<LLD (0/ 36)	ALL <LLD	-----	<LLD (0/ 12)	0
Ce-144	48	20	<LLD (0/ 36)	ALL <LLD	-----	<LLD	0
Co-57	48	6.0000	<LLD (0/ 36)	ALL <LLD	-----	<LLD (0/ 12)	0
Co-58	48	6.0000	<LLD (0/ 36)	ALL <LLD	-----	<LLD (0/ 12)	0
Co-60	48	6.0000	<LLD (0/ 36)	ALL <LLD	-----	<LLD (0/ 12)	0
Cs-134	48	6.0000	<LLD (0/ 36)	ALL <LLD	-----	<LLD (0/ 12)	0
Cs-137	48	6.0000	<LLD (0/ 36)	ALL <LLD	-----	<LLD (0/ 12)	0
Fe-59	48	20	<LLD (0/ 36)	ALL <LLD	-----	<LLD	0

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Table 5 Ocean Water Monthly Composite (pCi/l)							
K-40	48	20	315.83(36/ 36) (290- 350)	Outfall - Unit 3 0.7 mi. SW	324.17(12/ 12) (300- 350)	323.33(12/ 12) (290- 370)	0
Mn-54	48	6.0000	<LLD (0/ 36)	ALL <LLD	-----	<LLD (0/ 12)	0
Mo(Tc)-99m	48	2000	<LLD (0/ 36)	ALL <LLD	-----	<LLD (0/ 12)	0
Ra-226	48	15	<LLD (0/ 36)	ALL <LLD	-----	<LLD (0/ 12)	0
Ru-103	48	15	<LLD (0/ 36)	ALL <LLD	-----	<LLD (0/ 12)	0
Ru-106	48	30	<LLD (0/ 36)	ALL <LLD	-----	<LLD (0/ 12)	0
Th-228	48	20	20(1/ 36) (20.000-20.000)	Outfall - Unit 3 0.7 mi. SW	20(1/ 12) (20.000-20.000)	<LLD (0/ 12)	0
Zn-65	48	20	<LLD (0/ 36)	ALL <LLD	-----	<LLD (0/ 12)	0
Zr(Nb)-95	48	15	<LLD (0/ 36)	ALL <LLD	-----	<LLD (0/ 12)	0

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Table 6 Ocean Water Bi-Monthly Composite (pCi/l)							
	Gross Beta	24	100	822.22(18/ 18) (500- 1200)	Outfall - Unit 3 0.7 mi. SW	883.33(6/ 6) (700- 1200)	850(6/ 6) (700- 1000)	0

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Table 7 Ocean Water Quarterly Composite (pCi/l)							
	Tritium	16	100	2200(1/ 12) (2200- 2200)	Station Discharge Outfall - Unit 1 0.5 mi. SW	2200(1/ 4) (2200- 2200)	<LLD (0/ 4)	0

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Table 9a Drinking Water Monthly Composite (pCi/l)							
	Ag-110m 36	10	<LLD (0/ 24)	ALL <LLD	-----	<LLD (0/ 12)	0
	Be-7 36	50	<LLD (0/ 24)	ALL <LLD	-----	<LLD (0/ 12)	0
	Ce-141 36	15	<LLD (0/ 24)	ALL <LLD	-----	<LLD (0/ 12)	0
	Ce-144 36	20	<LLD (0/ 24)	ALL <LLD	-----	<LLD (0/ 12)	0
	Co-58 36	6.0000	<LLD (0/ 24)	ALL <LLD	-----	<LLD (0/ 12)	0
	Co-60 36	6.0000	<LLD (0/ 24)	ALL <LLD	-----	<LLD (0/ 12)	0
	Cs-134 36	6.0000	<LLD (0/ 24)	ALL <LLD	-----	<LLD (0/ 12)	0
	Cs-137 36	6.0000	<LLD (0/ 24)	ALL <LLD	-----	<LLD (0/ 12)	0
	H-3 36	100	<LLD (0/ 24)	ALL <LLD	-----	<LLD (0/ 12)	0

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Medium or Pathway Sampled (Unit of Measurement)	Type and Total Number of Analyses Performed	Lower Limit of Detection (LLD)	All Indicator Locations Mean(f) Range	Location With Highest Annual Mean Name, Distance and Direction	Mean(f) Range	Control Locations Mean(f) Range	Number of Nonroutine Reported Measurements
Table 9a Drinking Water Monthly Composite (pCi/l)							
Ru-103	36	15	<LLD (0/ 24)	ALL <LLD	-----	<LLD (0/ 12)	0
Zr(Nb)-95	36	15	<LLD (0/ 24)	ALL <LLD	-----	<LLD (0/ 12)	0

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Table 9b Drinking Water Monthly Composite (pCi/l)							
	Gross Alpha 36	0.2000	1.3500(10/ 24) (0.500- 3.300)	San Clemente Golf Course Well 3.5 mi. NNW	1.3500(10/ 12) (0.500- 3.300)	0.2000(1/ 12) (0.200- 0.200)	0
	Gross Beta 36	0.1000	3.2955(22/ 24) (0.300-28.000)	San Clemente Golf Course Well 3.5 mi. NNW	6.0545(11/ 12) (0.400-28.000)	0.2833(6/ 12) (0.200- 0.400)	0

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Table 9c Drinking Water Monthly Composite (pCi/l)							
	Gross Alpha 36	3.0000	8.0000(2/ 24) (6.000-10.000)	San Clemente Golf Course Well 3.5 mi. NNW	8.0000(2/ 12) (6.000-10.000)	<LLD (0/ 12)	0
	Gross Beta 36	0.5000	13.833(24/ 24) (6.000-24.000)	San Clemente Golf Course Well 3.5 mi. NNW	16.333(12/ 12) (13.000-24.000)	8.0000(12/ 12) (6.000-13.000)	0

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Table 9d Drinking Water Quarterly Composite (pCi/l)							
	Gross Alpha 12	0.2000	1.0500(4/ 8) (0.700- 1.200)	San Clemente Golf Course Well 3.5 mi. NNW	1.0500(4/ 4) (0.700- 1.200)	<LLD (0/ 4)	0
	Gross Beta 12	0.1000	3.2875(8/ 8) (0.400-10.100)	San Clemente Golf Course Well 3.5 mi. NNW	6.0250(4/ 4) (2.700-10.100)	0.3000(1/ 4) (0.300- 0.300)	0

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Table 9a Drinking Water Quarterly Composite (pCi/l)							
Ag-110m	12	15	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
Be-7	12	100	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
Ce-141	12	60	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
Ce-144	12	20	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
Co-58	12	10	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
Co-60	12	6.0000	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
Cs-134	12	6.0000	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
Cs-137	12	6.0000	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
Gross Alpha	12	3.0000	7.0000(1/ 8) (7.000- 7.000)	San Clemente Golf Course Well 3.5 mi. NNW	7.0000(1/ 4) (7.000- 7.000)	<LLD (0/ 4)	0

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Table 9a Drinking Water Quarterly Composite (pCi/l)							
Gross Beta	12	0.5000	13.875(8/ 8) (8.000-20.000)	San Clemente Golf Course Well 3.5 mi. NNW	17.75(4/ 4) (16.000-20.000)	9.2500(4/ 4) (7.000-12.000)	0
H-3	12	100	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
Ru-103	12	25	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
Zr(Nb)-95	12	30	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0

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Table 10 Shoreline Sediment Semi-Annual Composite (pCi/g)							
Ag-110m	8	0.0700	<LLD (0/ 6)	ALL <LLD	-----	<LLD (0/ 2)	0
Ce-141	8	0.1000	<LLD (0/ 6)	ALL <LLD	-----	<LLD (0/ 2)	0
Ce-144	8	0.2000	<LLD (0/ 6)	ALL <LLD	-----	<LLD (0/ 2)	0
Co-57	8	0.0500	<LLD (0/ 6)	ALL <LLD	-----	<LLD (0/ 2)	0
Co-58	8	0.0500	<LLD (0/ 6)	ALL <LLD	-----	<LLD (0/ 2)	0
Co-60	8	0.0500	<LLD (0/ 6)	ALL <LLD	-----	<LLD (0/ 2)	0
Cs-134	8	0.0500	<LLD (0/ 6)	ALL <LLD	-----	<LLD (0/ 2)	0
Cs-137	8	0.0500	<LLD (0/ 6)	ALL <LLD	-----	<LLD (0/ 2)	0
Fe-59	8	0.2000	<LLD (0/ 6)	ALL <LLD	-----	<LLD (0/ 2)	0

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Table 10 Shoreline Sediment Semi-Annual Composite (pCi/g)							
I-131	8	0.5000	<LLD (0/ 6)	ALL <LLD	-----	<LLD (0/ 2)	0
K-40	8	2.0000	14.217(6/ 6) (12.900-16.600)	Newport Beach (North End) 30 mi. NW	17.65(2/ 2) (17.500-17.800)	17.65(2/ 2) (17.500-17.800)	0
Mn-54	8	0.0500	<LLD (0/ 6)	ALL <LLD	-----	<LLD (0/ 2)	0
Mo(Tc)-99m	8	300	<LLD (0/ 6)	ALL <LLD	-----	<LLD (0/ 2)	0
Ra-226	8	0.1000	0.1900(6/ 6) (0.120- 0.370)	Newport Beach (North End) 30 mi. NW	0.3050(2/ 2) (0.240- 0.370)	0.3050(2/ 2) (0.240- 0.370)	0
Ru-103	8	0.1000	<LLD (0/ 6)	ALL <LLD	-----	<LLD (0/ 2)	0
Ru-106	8	0.3000	<LLD (0/ 6)	ALL <LLD	-----	<LLD (0/ 2)	0
Th-228	8	0.1000	0.1883(6/ 6) (0.120- 0.390)	Newport Beach (North End) 30 mi. NW	0.7200(2/ 2) (0.450- 0.990)	0.7200(2/ 2) (0.450- 0.990)	0
Zn-65	8	0.2000	<LLD (0/ 6)	ALL <LLD	-----	<LLD (0/ 2)	0

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Table 10 Shoreline Sediment Semi-Annual Composite (pCi/g)							
Zr(Nb)-95	8	0.1000	<LLD (0/ 6)	ALL <LLD	-----	<LLD (0/ 2)	0

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Table 11 Ocean Bottom Sediments Semi-Annual Composite (pCi/g)							
Ag-110m	10	0.0500	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 2)	0
Ce-141	10	0.0800	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 2)	0
Ce-144	10	0.1500	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 2)	0
Co-57	10	0.0400	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 2)	0
Co-58	10	0.0400	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 2)	0
Co-60	10	0.0400	0.0600(1/ 8) (0.060- 0.060)	Unit 1 Outfall 0.5 mi. W	0.0600(1/ 2) (0.060- 0.060)	<LLD (0/ 2)	0
Cs-134	10	0.0400	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 2)	0
Cs-137	10	0.0400	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 2)	0
Fe-59	10	0.1500	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 2)	0

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Table 11 Ocean Bottom Sediments Semi-Annual Composite (pCi/g)							
I-131	10	0.4000	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 2)	0
K-40	10	1.5000	12.675(8/ 8) (10.600-15.200)	Newport Beach 30 mi. NW	13.9(2/ 2) (13.200-14.600)	13.9(2/ 2) (13.200-14.600)	0
Mn-54	10	0.0400	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 2)	0
Mo(Tc)-99m	10	230	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 2)	0
Ra-226	10	0.0800	0.3437(8/ 8) (0.160- 0.560)	Unit 1 Outfall 0.5 mi. W	0.5500(2/ 2) (0.540- 0.560)	0.2350(2/ 2) (0.220- 0.250)	0
Ru-103	10	0.0800	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 2)	0
Ru-106	10	0.2000	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 2)	0
Th-228	10	0.0800	0.4000(8/ 8) (0.120- 0.700)	Unit 1 Outfall 0.5 mi. W	0.6700(2/ 2) (0.640- 0.700)	0.4550(2/ 2) (0.420- 0.490)	0
Zn-65	10	1.5000	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 2)	0

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Table 11 Ocean Bottom Sediments Semi-Annual Composite (pCi/g)							
Zr(Nb)-95	10	0.0800	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 2)	0

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Table 12a Non-Migratory Marine Quarterly Composite (pCi/g) (flesh type)							
bay mussel	Ag-110m 4	0.0700	<LLD (0/ 4)	ALL <LLD	-----	<LLD (0/ 0)	0
bay mussel	Ce-141 4	0.0700	<LLD (0/ 4)	ALL <LLD	-----	<LLD (0/ 0)	0
bay mussel	Ce-144 4	0.0700	<LLD (0/ 4)	ALL <LLD	-----	<LLD (0/ 0)	0
bay mussel	Co-57 4	0.0100	<LLD (0/ 4)	ALL <LLD	-----	<LLD (0/ 0)	0
bay mussel	Co-58 4	0.0100	0.0100(1/ 4) (0.010- 0.010)	Units 2/3 0.7 mi. Outfall SSW	0.0100(1/ 3) (0.010- 0.010)	<LLD (0/ 0)	0
bay mussel	Co-60 4	0.0070	0.0117(4/ 4) (0.007- 0.019)	Units 2/3 0.7 mi. Outfall SSW	0.0120(3/ 3) (0.007- 0.019)	<LLD (0/ 0)	0
bay mussel	Cs-134 4	0.0100	<LLD (0/ 4)	ALL <LLD	-----	<LLD (0/ 0)	0
bay mussel	Cs-137 4	0.0030	<LLD (0/ 4)	ALL <LLD	-----	<LLD (0/ 0)	0
bay mussel	Fe-59 4	0.0700	<LLD (0/ 4)	ALL <LLD	-----	<LLD (0/ 0)	0

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Table 12a Non-Migratory Marine Quarterly Composite (pCi/g) (flesh type)							
bay mussel	H-3 Aqueous	4	0.0500	<LLD (0/ 4)	ALL <LLD	-----	<LLD (0/ 0)	0
bay mussel	H-3 Bound	4	3.0000	<LLD (0/ 4)	ALL <LLD	-----	<LLD (0/ 0)	0
bay mussel	I-131	4	0.2000	<LLD (0/ 4)	ALL <LLD	-----	<LLD (0/ 0)	0
bay mussel	K-40	4	0.2000	0.7175(4/ 4) (0.670- 0.750)	Units 2/3 Outfall 0.7 mi. SSW	0.7333(3/ 3) (0.700- 0.750)	<LLD (0/ 0)	0
bay mussel	Mn-54	4	0.0100	<LLD (0/ 4)	ALL <LLD	-----	<LLD (0/ 0)	0
bay mussel	Mo(Tc)-99m	4	10	<LLD (0/ 4)	ALL <LLD	-----	<LLD (0/ 0)	0
bay mussel	Ra-226	4	0.0300	<LLD (0/ 4)	ALL <LLD	-----	<LLD (0/ 0)	0
bay mussel	Ru-103	4	0.0300	<LLD (0/ 4)	ALL <LLD	-----	<LLD (0/ 0)	0
bay mussel	Ru-106	4	0.0700	<LLD (0/ 4)	ALL <LLD	-----	<LLD (0/ 0)	0

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Table 12a Non-Migratory Marine Quarterly Composite (pCi/g) (flesh type)							
bay mussel	Th-228	4	0.0300	<LLD (0/ 4)	ALL <LLD	-----	<LLD (0/ 0)	0
bay mussel	Zn-65	4	0.0700	<LLD (0/ 4)	ALL <LLD	-----	<LLD (0/ 0)	0
bay mussel	Zr(Nb)-95	4	0.0300	<LLD (0/ 4)	ALL <LLD	-----	<LLD (0/ 0)	0
black perch	Ag-110m	12	0.0700	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
black perch	Ce-141	12	0.0700	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
black perch	Ce-144	12	0.0700	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
black perch	Co-57	12	0.0100	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
black perch	Co-58	12	0.0100	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
black perch	Co-60	12	0.0070	0.0100(2/ 8) (0.008- 0.012)	Unit 1 Outfall 0.6 mi. WSW	0.0100(2/ 4) (0.008- 0.012)	<LLD (0/ 4)	0

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Table 12a Non-Migratory Marine Quarterly Composite (pCi/g) (flesh type)							
black perch	Cs-134	12	0.0100	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
black perch	Cs-137	12	0.0064(7/ 8) (0.005- 0.009)	Unit 1 Outfall 0.6 mi. WSW	0.0070(4/ 4) (0.005- 0.009)	0.0055(3/ 4) (0.004- 0.007)	0
black perch	Fe-59	12	0.0700	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
black perch	H-3 Aqueous	12	0.0500	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
black perch	H-3 Bound	12	3.0000	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
black perch	I-131	12	0.2000	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
black perch	K-40	12	0.2000	2.4125(8/ 8) (1.800- 2.800)	Unit 1 Outfall 0.6 mi. WSW	2.4750(4/ 4) (2.300- 2.700)	2.3000(4/ 4) (2.000- 2.500)	0
black perch	Mn-54	12	0.0100	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
black perch	Mo(Tc)-99m	12	10	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0

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Table 12a Non-Migratory Marine Quarterly Composite (pCi/g) (flesh type)							
black perch	Ra-226	12	0.0300	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
black perch	Ru-103	12	0.0300	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
black perch	Ru-106	12	0.0700	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
black perch	Th-228	12	0.0300	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
black perch	Zn-65	12	0.0700	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
black perch	Zr(Nb)-95	12	0.0300	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
keyhole limpet	Ag-110m	4	0.0700	<LLD (0/ 0)	ALL <LLD	-----	<LLD (0/ 4)	0
keyhole limpet	Ce-141	4	0.0700	<LLD (0/ 0)	ALL <LLD	-----	<LLD (0/ 4)	0
keyhole limpet	Ce-144	4	0.0700	<LLD (0/ 0)	ALL <LLD	-----	<LLD (0/ 4)	0

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Table 12a Non-Migratory Marine Quarterly Composite (pCi/g) (flesh type)							
keyhole limpet	Co-57	4	0.0100	<LLD (0/ 0)	ALL <LLD	-----	<LLD (0/ 4)	0
keyhole limpet	Co-58	4	0.0100	<LLD (0/ 0)	ALL <LLD	-----	<LLD (0/ 4)	0
keyhole limpet	Co-60	4	0.0070	<LLD (0/ 0)	ALL <LLD	-----	<LLD (0/ 4)	0
keyhole limpet	Cs-134	4	0.0100	<LLD (0/ 0)	ALL <LLD	-----	<LLD (0/ 4)	0
keyhole limpet	Cs-137	4	0.0030	<LLD (0/ 0)	ALL <LLD	-----	<LLD (0/ 4)	0
keyhole limpet	Fe-59	4	0.0700	<LLD (0/ 0)	ALL <LLD	-----	<LLD (0/ 4)	0
keyhole limpet	H-3 Aqueous	4	0.0500	<LLD (0/ 0)	ALL <LLD	-----	<LLD (0/ 4)	0
keyhole limpet	H-3 Bound	4	3.0000	<LLD (0/ 0)	ALL <LLD	-----	<LLD (0/ 4)	0
keyhole limpet	I-131	4	0.2000	<LLD (0/ 0)	ALL <LLD	-----	<LLD (0/ 4)	0

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Table 12a Non-Migratory Marine Quarterly Composite (pCi/g) (flesh type)							
keyhole limpet	K-40	4	0.2000	<LLD (0/ 0)	Newport Beach 30 mi. NW	0.8875(4/ 4) (0.680- 1.020)	0.8875(4/ 4) (0.680- 1.020)	0
keyhole limpet	Mn-54	4	0.0100	<LLD (0/ 0)	ALL <LLD	-----	<LLD (0/ 4)	0
keyhole limpet	Mo(Tc)-99m	4	10	<LLD (0/ 0)	ALL <LLD	-----	<LLD (0/ 4)	0
keyhole limpet	Ra-226	4	0.0300	<LLD (0/ 0)	ALL <LLD	-----	<LLD (0/ 4)	0
keyhole limpet	Ru-103	4	0.0300	<LLD (0/ 0)	ALL <LLD	-----	<LLD (0/ 4)	0
keyhole limpet	Ru-106	4	0.0700	<LLD (0/ 0)	ALL <LLD	-----	<LLD (0/ 4)	0
keyhole limpet	Th-228	4	0.0300	<LLD (0/ 0)	ALL <LLD	-----	<LLD (0/ 4)	0
keyhole limpet	Zn-65	4	0.0700	<LLD (0/ 0)	ALL <LLD	-----	<LLD (0/ 4)	0
keyhole limpet	Zr(Nb)-95	4	0.0300	<LLD (0/ 0)	ALL <LLD	-----	<LLD (0/ 4)	0

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Table 12a Non-Migratory Marine Quarterly Composite (pCi/g) (flesh type)							
sea hare	Ag-110m 4	0.0700	<LLD (0/ 4)	ALL <LLD	-----	<LLD (0/ 0)	0
sea hare	Ce-141 4	0.0700	<LLD (0/ 4)	ALL <LLD	-----	<LLD (0/ 0)	0
sea hare	Ce-144 4	0.0700	<LLD (0/ 4)	ALL <LLD	-----	<LLD (0/ 0)	0
sea hare	Co-57 4	0.0100	<LLD (0/ 4)	ALL <LLD	-----	<LLD (0/ 0)	0
sea hare	Co-58 4	0.0100	0.0220(2/ 4) (0.018- 0.026)	Unit 1 Outfall 0.6 mi. WSW	0.0220(2/ 3) (0.018- 0.026)	<LLD (0/ 0)	0
sea hare	Co-60 4	0.0070	0.0687(4/ 4) (0.014- 0.136)	Unit 1 Outfall 0.6 mi. WSW	0.0870(3/ 3) (0.041- 0.136)	<LLD (0/ 0)	0
sea hare	Cs-134 4	0.0100	<LLD (0/ 4)	ALL <LLD	-----	<LLD (0/ 0)	0
sea hare	Cs-137 4	0.0030	<LLD (0/ 4)	ALL <LLD	-----	<LLD (0/ 0)	0
sea hare	Fe-59 4	0.0700	<LLD (0/ 4)	ALL <LLD	-----	<LLD (0/ 0)	0

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Table 12a Non-Migratory Marine Quarterly Composite (pCi/g) (flesh type)							
sea hare	H-3 Aqueous	4	0.0500	<LLD (0/ 4)	ALL <LLD	-----	<LLD (0/ 0)	0
sea hare	H-3 Bound	4	3.0000	<LLD (0/ 4)	ALL <LLD	-----	<LLD (0/ 0)	0
sea hare	I-131	4	0.2000	<LLD (0/ 4)	ALL <LLD	-----	<LLD (0/ 0)	0
sea hare	K-40	4	0.2000	0.9925(4/ 4) (0.840- 1.200)	Units 2/3 Outfall 0.7 mi. SSW	1.2000(1/ 1) (1.200- 1.200)	<LLD (0/ 0)	0
sea hare	Mn-54	4	0.0100	<LLD (0/ 4)	ALL <LLD	-----	<LLD (0/ 0)	0
sea hare	Mo(Tc)-99m	4	10	<LLD (0/ 4)	ALL <LLD	-----	<LLD (0/ 0)	0
sea hare	Ra-226	4	0.0300	0.0400(1/ 4) (0.040- 0.040)	Unit 1 Outfall 0.6 mi. WSW	0.0400(1/ 3) (0.040- 0.040)	<LLD (0/ 0)	0
sea hare	Ru-103	4	0.0300	<LLD (0/ 4)	ALL <LLD	-----	<LLD (0/ 0)	0
sea hare	Ru-106	4	0.0700	<LLD (0/ 4)	ALL <LLD	-----	<LLD (0/ 0)	0

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Table 12a Non-Migratory Marine Quarterly Composite (pCi/g) (flesh type)							
sea hare	Th-228	4	0.0440(2/ 4) (0.038- 0.050)	Unit 1 Outfall 0.6 mi. WSW	0.0440(2/ 3) (0.038- 0.050)	<LLD (0/ 0)	0
sea hare	Zn-65	4	0.0700 <LLD (0/ 4)	ALL <LLD	-----	<LLD (0/ 0)	0
sea hare	Zr(Nb)-95	4	0.0300 <LLD (0/ 4)	ALL <LLD	-----	<LLD (0/ 0)	0
sheephead	Ag-110m	12	0.0700 <LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
sheephead	Ce-141	12	0.0700 <LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
sheephead	Ce-144	12	0.0700 <LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
sheephead	Co-57	12	0.0100 <LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
sheephead	Co-58	12	0.0150(2/ 8) (0.015- 0.015)	Unit 1 Outfall 0.6 mi. WSW	0.0150(2/ 4) (0.015- 0.015)	<LLD (0/ 4)	0
sheephead	Co-60	12	0.0365(2/ 8) (0.027- 0.046)	Unit 1 Outfall 0.6 mi. WSW	0.0365(2/ 4) (0.027- 0.046)	<LLD (0/ 4)	0

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Table 12a Non-Migratory Marine Quarterly Composite (pCi/g) (flesh type)							
sheephead	Cs-134	12	0.0100	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
sheephead	Cs-137	12	0.0030	0.0123(8/ 8) (0.005- 0.035)	Unit 1 Outfall 0.6 mi. WSW	0.0167(4/ 4) (0.005- 0.035)	0.0046(4/ 4) (0.004- 0.005)	0
sheephead	Fe-59	12	0.0700	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
sheephead	H-3 Aqueous	12	0.0500	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
sheephead	H-3 Bound	12	3.0000	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
sheephead	I-131	12	0.2000	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
sheephead	K-40	12	0.2000	2.7625(8/ 8) (2.100- 3.200)	Units 2/3 Outfall 0.7 mi. SSW	2.9000(4/ 4) (2.700- 3.200)	2.6000(4/ 4) (2.300- 3.000)	0
sheephead	Mn-54	12	0.0100	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
sheephead	Mo(Tc)-99m	12	10	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0

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Table 12a Non-Migratory Marine Quarterly Composite (pCi/g) (flesh type)								
sheephead	Ra-226	12	0.0300	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
sheephead	Ru-103	12	0.0300	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
sheephead	Ru-106	12	0.0700	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
sheephead	Th-228	12	0.0300	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
sheephead	Zn-65	12	0.0700	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
sheephead	Zr(Nb)-95	12	0.0300	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
spiny lobster	Ag-110m	12	0.0700	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
spiny lobster	Ce-141	12	0.0700	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
spiny lobster	Ce-144	12	0.0700	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0

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Table 12a Non-Migratory Marine Quarterly Composite (pCi/g) (flesh type)							
spiny lobster	Co-57	12	0.0100	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
spiny lobster	Co-58	12	0.0100	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
spiny lobster	Co-60	12	0.0070	0.0116(5/ 8) (0.008- 0.017)	Unit 1 Outfall 0.6 mi. WSW	0.0130(3/ 4) (0.008- 0.017)	<LLD (0/ 4)	0
spiny lobster	Cs-134	12	0.0100	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
spiny lobster	Cs-137	12	0.0030	0.0053(8/ 8) (0.004- 0.012)	Units 2/3 Outfall 0.7 mi. SSW	0.0061(4/ 4) (0.004- 0.012)	0.0036(3/ 4) (0.003- 0.004)	0
spiny lobster	Fe-59	12	0.0700	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
spiny lobster	H-3 Aqueous	12	0.0500	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
spiny lobster	H-3 Bound	12	3.0000	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
spiny lobster	I-131	12	0.2000	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0

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Table 12a Non-Migratory Marine Quarterly Composite (pCi/g) (flesh type)							
spiny lobster	K-40	12	0.2000	2.6000(8/ 8) (1.900- 3.300)	Newport Beach 30 mi. NW	2.8750(4/ 4) (2.500- 3.200)	2.8750(4/ 4) (2.500- 3.200)	0
spiny lobster	Mn-54	12	0.0100	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
spiny lobster	Mo(Tc)-99m	12	10	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
spiny lobster	Ra-226	12	0.0300	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
spiny lobster	Ru-103	12	0.0300	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
spiny lobster	Ru-106	12	0.0700	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
spiny lobster	Th-228	12	0.0300	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
spiny lobster	Zn-65	12	0.0700	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
spiny lobster	Zr(Nb)-95	12	0.0300	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0

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Table 12b Non-Migratory Marine Quarterly Composite (pCi/g) (bone type)							
bay mussel	Ag-110m	4	0.0100	<LLD (0/ 4)	ALL <LLD	-----	<LLD (0/ 0)	0
bay mussel	Ce-141	4	0.1000	<LLD (0/ 4)	ALL <LLD	-----	<LLD (0/ 0)	0
bay mussel	Ce-144	4	0.1000	<LLD (0/ 4)	ALL <LLD	-----	<LLD (0/ 0)	0
bay mussel	Co-57	4	0.0300	<LLD (0/ 4)	ALL <LLD	-----	<LLD (0/ 0)	0
bay mussel	Co-58	4	0.0200	<LLD (0/ 4)	ALL <LLD	-----	<LLD (0/ 0)	0
bay mussel	Co-60	4	0.0100	<LLD (0/ 4)	ALL <LLD	-----	<LLD (0/ 0)	0
bay mussel	Cs-134	4	0.0300	<LLD (0/ 4)	ALL <LLD	-----	<LLD (0/ 0)	0
bay mussel	Cs-137	4	0.0300	<LLD (0/ 4)	ALL <LLD	-----	<LLD (0/ 0)	0
bay mussel	Fe-59	4	0.1000	<LLD (0/ 4)	ALL <LLD	-----	<LLD (0/ 0)	0

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Table 12b Non-Migratory Marine Quarterly Composite (pCi/g) (bone type)							
bay mussel	I-131	4	0.3000	<LLD (0/ 4)	ALL <LLD	-----	<LLD (0/ 0)	0
bay mussel	K-40	4	0.2000	<LLD (0/ 4)	ALL <LLD	-----	<LLD (0/ 0)	0
bay mussel	Mn-54	4	0.0300	<LLD (0/ 4)	ALL <LLD	-----	<LLD (0/ 0)	0
bay mussel	Mo(Tc)-99m	4	60	<LLD (0/ 4)	ALL <LLD	-----	<LLD (0/ 0)	0
bay mussel	Ra-226	4	0.0500	<LLD (0/ 4)	ALL <LLD	-----	<LLD (0/ 0)	0
bay mussel	Ru-103	4	0.0500	<LLD (0/ 4)	ALL <LLD	-----	<LLD (0/ 0)	0
bay mussel	Ru-106	4	0.1000	<LLD (0/ 4)	ALL <LLD	-----	<LLD (0/ 0)	0
bay mussel	Th-228	4	0.0500	<LLD (0/ 4)	ALL <LLD	-----	<LLD (0/ 0)	0
bay mussel	Zn-65	4	0.1000	<LLD (0/ 4)	ALL <LLD	-----	<LLD (0/ 0)	0

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Table 12b Non-Migratory Marine Quarterly Composite (pCi/g) (bone type)							
bay mussel	Zr(Nb)-95	4	0.0600	<LLD (0/ 4)	ALL <LLD	-----	<LLD (0/ 0)	0
black perch	Ag-110m	12	0.0100	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
black perch	Ce-141	12	0.1000	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
black perch	Ce-144	12	0.1000	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
black perch	Co-57	12	0.0300	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
black perch	Co-58	12	0.0200	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
black perch	Co-60	12	0.0100	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
black perch	Cs-134	12	0.0300	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
black perch	Cs-137	12	0.0300	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0

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Table 12b Non-Migratory Marine Quarterly Composite (pCi/g) (bone type)							
black perch	Fe-59	12	0.1000	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
black perch	I-131	12	0.3000	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
black perch	K-40	12	0.2000	0.7500(6/ 8) (0.400- 1.000)	Unit 1 Outfall 0.6 mi. WSW	0.8333(3/ 4) (0.700- 1.000)	<LLD (0/ 4)	0
black perch	Mn-54	12	0.0300	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
black perch	Mo(Tc)-99m	12	60	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
black perch	Ra-226	12	0.0500	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
black perch	Ru-103	12	0.0500	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
black perch	Ru-106	12	0.1000	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
black perch	Th-228	12	0.0500	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0

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Table 12b Non-Migratory Marine Quarterly Composite (pCi/g) (bone type)							
black perch	Zn-65	12	0.1000	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
black perch	Zr(Nb)-95	12	0.0600	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
keyhole limpet	Ag-110m	4	0.0100	<LLD (0/ 0)	ALL <LLD	-----	<LLD (0/ 4)	0
keyhole limpet	Ce-141	4	0.1000	<LLD (0/ 0)	ALL <LLD	-----	<LLD (0/ 4)	0
keyhole limpet	Ce-144	4	0.1000	<LLD (0/ 0)	ALL <LLD	-----	<LLD (0/ 4)	0
keyhole limpet	Co-57	4	0.0300	<LLD (0/ 0)	ALL <LLD	-----	<LLD (0/ 4)	0
keyhole limpet	Co-58	4	0.0200	<LLD (0/ 0)	ALL <LLD	-----	<LLD (0/ 4)	0
keyhole limpet	Co-60	4	0.0100	<LLD (0/ 0)	ALL <LLD	-----	<LLD (0/ 4)	0
keyhole limpet	Cs-134	4	0.0300	<LLD (0/ 0)	ALL <LLD	-----	<LLD (0/ 4)	0

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Table 12b Non-Migratory Marine Quarterly Composite (pCi/g) (bone type)							
keyhole limpet	Cs-137	4	0.0300	<LLD (0/ 0)	ALL <LLD	-----	<LLD (0/ 4)	0
keyhole limpet	Fe-59	4	0.1000	<LLD (0/ 0)	ALL <LLD	-----	<LLD (0/ 4)	0
keyhole limpet	I-131	4	0.3000	<LLD (0/ 0)	ALL <LLD	-----	<LLD (0/ 4)	0
keyhole limpet	K-40	4	0.2000	<LLD (0/ 0)	ALL <LLD	-----	<LLD (0/ 4)	0
keyhole limpet	Mn-54	4	0.0300	<LLD (0/ 0)	ALL <LLD	-----	<LLD (0/ 4)	0
keyhole limpet	Mo(Tc)-99m	4	60	<LLD (0/ 0)	ALL <LLD	-----	<LLD (0/ 4)	0
keyhole limpet	Ra-226	4	0.0500	<LLD (0/ 0)	ALL <LLD	-----	<LLD (0/ 4)	0
keyhole limpet	Ru-103	4	0.0500	<LLD (0/ 0)	ALL <LLD	-----	<LLD (0/ 4)	0
keyhole limpet	Ru-106	4	0.1000	<LLD (0/ 0)	ALL <LLD	-----	<LLD (0/ 4)	0

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Table 12b Non-Migratory Marine Quarterly Composite (pCi/g) (bone type)							
keyhole limpet	Th-228	4	0.0500	<LLD (0/ 0)	ALL <LLD	-----	<LLD (0/ 4)	0
keyhole limpet	Zn-65	4	0.1000	<LLD (0/ 0)	ALL <LLD	-----	<LLD (0/ 4)	0
keyhole limpet	Zr(Nb)-95	4	0.0600	<LLD (0/ 0)	ALL <LLD	-----	<LLD (0/ 4)	0
sheephead	Ag-110m	12	0.0100	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
sheephead	Ce-141	12	0.1000	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
sheephead	Ce-144	12	0.1000	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
sheephead	Co-57	12	0.0300	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
sheephead	Co-58	12	0.0200	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
sheephead	Co-60	12	0.0100	0.0200(1/ 8) (0.020- 0.020)	Unit 1 Outfall 0.6 mi. WSW	0.0200(1/ 4) (0.020- 0.020)	<LLD (0/ 4)	0

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Table 12b Non-Migratory Marine Quarterly Composite (pCi/g) (bone type)							
sheephead	Cs-134	12	0.0300	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4) 0
sheephead	Cs-137	12	0.0300	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4) 0
sheephead	Fe-59	12	0.1000	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4) 0
sheephead	I-131	12	0.3000	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4) 0
sheephead	K-40	12	0.2000	0.8167(6/ 8) (0.400- 2.000)	Units 2/3 Outfall 0.7 mi. SSW	1.3500(2/ 4) (0.700- 2.000)	0.4333(3/ 4) (0.300- 0.600) 0
sheephead	Mn-54	12	0.0300	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4) 0
sheephead	Mo(Tc)-99m	12	60	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4) 0
sheephead	Ra-226	12	0.0500	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4) 0
sheephead	Ru-103	12	0.0500	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4) 0

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Table 12b Non-Migratory Marine Quarterly Composite (pCi/g) (bone type)							
sheephead	Ru-106	12	0.1000	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
sheephead	Th-228	12	0.0500	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
sheephead	Zn-65	12	0.1000	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
sheephead	Zr(Nb)-95	12	0.0600	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
spiny lobster	Ag-110m	12	0.0100	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
spiny lobster	Ce-141	12	0.1000	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
spiny lobster	Ce-144	12	0.1000	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
spiny lobster	Co-57	12	0.0300	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
spiny lobster	Co-58	12	0.0200	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0

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Table 12b Non-Migratory Marine Quarterly Composite (pCi/g) (bone type)							
spiny lobster	Co-60	12	0.0100	0.0175(2/ 8) (0.017- 0.018)	Units 2/3 Outfall 0.7 mi. SSW	0.0180(1/ 4) (0.018- 0.018)	<LLD (0/ 4)	0
spiny lobster	Cs-134	12	0.0300	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
spiny lobster	Cs-137	12	0.0300	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
spiny lobster	Fe-59	12	0.1000	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
spiny lobster	I-131	12	0.3000	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
spiny lobster	K-40	12	0.2000	0.9150(8/ 8) (0.800- 1.110)	Units 2/3 Outfall 0.7 mi. SSW	0.9425(4/ 4) (0.800- 1.110)	0.8450(4/ 4) (0.620- 1.180)	0
spiny lobster	Mn-54	12	0.0300	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
spiny lobster	Mo(Tc)-99m	12	60	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0
spiny lobster	Ra-226	12	0.0500	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4)	0

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Table 12b Non-Migratory Marine Quarterly Composite (pCi/g) (bone type)							
spiny lobster	Ru-103	12	0.0500	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4) 0
spiny lobster	Ru-106	12	0.1000	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4) 0
spiny lobster	Th-228	12	0.0500	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4) 0
spiny lobster	Zn-65	12	0.1000	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4) 0
spiny lobster	Zr(Nb)-95	12	0.0600	<LLD (0/ 8)	ALL <LLD	-----	<LLD (0/ 4) 0

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Table 13a Local Crops Semi-Annual Composite (pCi/g)							
cauliflower	Ag-110m	1 0.0100	<LLD (0/ 1)	ALL <LLD	-----	<LLD (0/ 0)	0
cauliflower	Be-7	1 0.0400	<LLD (0/ 1)	ALL <LLD	-----	<LLD (0/ 0)	0
cauliflower	Ce-141	1 0.0100	<LLD (0/ 1)	ALL <LLD	-----	<LLD (0/ 0)	0
cauliflower	Ce-144	1 0.0200	<LLD (0/ 1)	ALL <LLD	-----	<LLD (0/ 0)	0
cauliflower	Co-58	1 0.0070	<LLD (0/ 1)	ALL <LLD	-----	<LLD (0/ 0)	0
cauliflower	Co-60	1 0.0070	<LLD (0/ 1)	ALL <LLD	-----	<LLD (0/ 0)	0
cauliflower	Cs-134	1 0.0050	<LLD (0/ 1)	ALL <LLD	-----	<LLD (0/ 0)	0
cauliflower	Cs-137	1 0.0050	<LLD (0/ 1)	ALL <LLD	-----	<LLD (0/ 0)	0
cauliflower	I-131	1 0.0030	<LLD (0/ 1)	ALL <LLD	-----	<LLD (0/ 0)	0

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Table 13a Local Crops Semi-Annual Composite (pCi/g)							
cauliflower	K-40	1	0.0700	2.2000(1/ 1) (2.200- 2.200)	San Mateo Canyon 2.6 mi. NW	2.2000(1/ 1) (2.200- 2.200)	<LLD (0/ 0)	0
cauliflower	Ru-103	1	0.0100	<LLD (0/ 1)	ALL <LLD	-----	<LLD (0/ 0)	0
cauliflower	Zr(Nb)-95	1	0.0100	<LLD (0/ 1)	ALL <LLD	-----	<LLD (0/ 0)	0
corn	Ag-110m	1	0.0100	<LLD (0/ 1)	ALL <LLD	-----	<LLD (0/ 0)	0
corn	Be-7	1	0.0400	<LLD (0/ 1)	ALL <LLD	-----	<LLD (0/ 0)	0
corn	Ce-141	1	0.0100	<LLD (0/ 1)	ALL <LLD	-----	<LLD (0/ 0)	0
corn	Ce-144	1	0.0200	<LLD (0/ 1)	ALL <LLD	-----	<LLD (0/ 0)	0
corn	Co-58	1	0.0070	<LLD (0/ 1)	ALL <LLD	-----	<LLD (0/ 0)	0
corn	Co-60	1	0.0070	<LLD (0/ 1)	ALL <LLD	-----	<LLD (0/ 0)	0

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Table 13a Local Crops Semi-Annual Composite (pCi/g)							
corn	Cs-134	1	0.0050	<LLD (0/ 1)	ALL <LLD	-----	<LLD (0/ 0)	0
corn	Cs-137	1	0.0050	<LLD (0/ 1)	ALL <LLD	-----	<LLD (0/ 0)	0
corn	I-131	1	0.0030	<LLD (0/ 1)	ALL <LLD	-----	<LLD (0/ 0)	0
corn	K-40	1	0.0700	15.4(1/ 1) (15.400-15.400)	San Mateo Canyon 2.6 mi. NW	15.4(1/ 1) (15.400-15.400)	<LLD (0/ 0)	0
corn	Ru-103	1	0.0100	<LLD (0/ 1)	ALL <LLD	-----	<LLD (0/ 0)	0
corn	Zr(Nb)-95	1	0.0100	<LLD (0/ 1)	ALL <LLD	-----	<LLD (0/ 0)	0
cucumber	Ag-110m	1	0.0100	<LLD (0/ 1)	ALL <LLD	-----	<LLD (0/ 0)	0
cucumber	Be-7	1	0.0400	<LLD (0/ 1)	ALL <LLD	-----	<LLD (0/ 0)	0
cucumber	Ce-141	1	0.0100	<LLD (0/ 1)	ALL <LLD	-----	<LLD (0/ 0)	0

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Table 13a Local Crops Semi-Annual Composite (pCi/g)							
cucumber	Ce-144	1	0.0200	<LLD (0/ 1)	ALL <LLD	-----	<LLD (0/ 0)	0
cucumber	Co-58	1	0.0070	<LLD (0/ 1)	ALL <LLD	-----	<LLD (0/ 0)	0
cucumber	Co-60	1	0.0070	<LLD (0/ 1)	ALL <LLD	-----	<LLD (0/ 0)	0
cucumber	Cs-134	1	0.0050	<LLD (0/ 1)	ALL <LLD	-----	<LLD (0/ 0)	0
cucumber	Cs-137	1	0.0050	<LLD (0/ 1)	ALL <LLD	-----	<LLD (0/ 0)	0
cucumber	I-131	1	0.0030	<LLD (0/ 1)	ALL <LLD	-----	<LLD (0/ 0)	0
cucumber	K-40	1	0.0700	1.0800(1/ 1) (1.080- 1.080)	San Mateo Canyon 2.6 mi. NW	1.0800(1/ 1) (1.080- 1.080)	<LLD (0/ 0)	0
cucumber	Ru-103	1	0.0100	<LLD (0/ 1)	ALL <LLD	-----	<LLD (0/ 0)	0
cucumber	Zr(Nb)-95	1	0.0100	<LLD (0/ 1)	ALL <LLD	-----	<LLD (0/ 0)	0

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Table 13a Local Crops Semi-Annual Composite (pCi/g)							
kale	Ag-110m	2	0.0100	<LLD (0/ 0)	ALL <LLD	-----	<LLD (0/ 2)	0
kale	Be-7	2	0.0400	<LLD (0/ 0)	ALL <LLD	-----	<LLD (0/ 2)	0
kale	Ce-141	2	0.0100	<LLD (0/ 0)	ALL <LLD	-----	<LLD (0/ 2)	0
kale	Ce-144	2	0.0200	<LLD (0/ 0)	ALL <LLD	-----	<LLD (0/ 2)	0
kale	Co-58	2	0.0070	<LLD (0/ 0)	ALL <LLD	-----	<LLD (0/ 2)	0
kale	Co-60	2	0.0070	<LLD (0/ 0)	ALL <LLD	-----	<LLD (0/ 2)	0
kale	Cs-134	2	0.0050	<LLD (0/ 0)	ALL <LLD	-----	<LLD (0/ 2)	0
kale	Cs-137	2	0.0050	<LLD (0/ 0)	ALL <LLD	-----	<LLD (0/ 2)	0
kale	I-131	2	0.0030	<LLD (0/ 0)	ALL <LLD	-----	<LLD (0/ 2)	0

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Table 13a Local Crops Semi-Annual Composite (pCi/g)							
kale	K-40	2	0.0700	<LLD (0/ 0)	SE of Oceanside 22 mi. SE	2.7000(2/ 2) (2.600- 2.800)	2.7000(2/ 2) (2.600- 2.800)	0
kale	Ru-103	2	0.0100	<LLD (0/ 0)	ALL <LLD	-----	<LLD (0/ 2)	0
kale	Zr(Nb)-95	2	0.0100	<LLD (0/ 0)	ALL <LLD	-----	<LLD (0/ 2)	0
tomato	Ag-110m	3	0.0100	<LLD (0/ 1)	ALL <LLD	-----	<LLD (0/ 2)	0
tomato	Be-7	3	0.0400	<LLD (0/ 1)	ALL <LLD	-----	<LLD (0/ 2)	0
tomato	Ce-141	3	0.0100	<LLD (0/ 1)	ALL <LLD	-----	<LLD (0/ 2)	0
tomato	Ce-144	3	0.0200	<LLD (0/ 1)	ALL <LLD	-----	<LLD (0/ 2)	0
tomato	Co-58	3	0.0070	<LLD (0/ 1)	ALL <LLD	-----	<LLD (0/ 2)	0
tomato	Co-60	3	0.0070	<LLD (0/ 1)	ALL <LLD	-----	<LLD (0/ 2)	0

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Table 13a Local Crops Semi-Annual Composite (pCi/g)							
tomato	Cs-134	3	0.0050	<LLD (0/ 1)	ALL <LLD	-----	<LLD (0/ 2)	0
tomato	Cs-137	3	0.0050	<LLD (0/ 1)	SE of Oceanside 22 mi. SE	0.0100(1/ 2) (0.010- 0.010)	0.0100(1/ 2) (0.010- 0.010)	0
tomato	I-131	3	0.0030	<LLD (0/ 1)	ALL <LLD	-----	<LLD (0/ 2)	0
tomato	K-40	3	0.0700	1.9000(1/ 1) (1.900- 1.900)	San Mateo Canyon 2.6 mi. NW	1.9000(1/ 1) (1.900- 1.900)	1.3850(2/ 2) (1.170- 1.600)	0
tomato	Ru-103	3	0.0100	<LLD (0/ 1)	ALL <LLD	-----	<LLD (0/ 2)	0
tomato	Zr(Nb)-95	3	0.0100	<LLD (0/ 1)	ALL <LLD	-----	<LLD (0/ 2)	0

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Table 13b Local Crops Semi-Annual Composite (pCi/g)							
cauliflower	H-3 Aqueous	1	0.0500	<LLD (0/ 1)	ALL <LLD	-----	<LLD (0/ 0) 0
cauliflower	H-3 Bound	1	0.5000	<LLD (0/ 1)	ALL <LLD	-----	<LLD (0/ 0) 0
cauliflower	Sr-90	1	0.0040	<LLD (0/ 1)	ALL <LLD	-----	<LLD (0/ 0) 0
corn	H-3 Aqueous	1	0.0500	<LLD (0/ 1)	ALL <LLD	-----	<LLD (0/ 0) 0
corn	H-3 Bound	1	0.5000	<LLD (0/ 1)	ALL <LLD	-----	<LLD (0/ 0) 0
corn	Sr-90	1	0.0040	<LLD (0/ 1)	ALL <LLD	-----	<LLD (0/ 0) 0
cucumber	H-3 Aqueous	1	0.0500	<LLD (0/ 1)	ALL <LLD	-----	<LLD (0/ 0) 0
cucumber	H-3 Bound	1	0.5000	<LLD (0/ 1)	ALL <LLD	-----	<LLD (0/ 0) 0
cucumber	Sr-90	1	0.0040	<LLD (0/ 1)	ALL <LLD	-----	<LLD (0/ 0) 0

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Table 13b Local Crops Semi-Annual Composite (pCi/g)							
kale	H-3 Aqueous	2	0.0500	<LLD (0/ 0)	ALL <LLD	-----	<LLD (0/ 2)	0
kale	H-3 Bound	2	0.5000	<LLD (0/ 0)	ALL <LLD	-----	<LLD (0/ 2)	0
kale	Sr-90	2	0.0040	<LLD (0/ 0)	SE of Oceanside 22 mi. SE	0.0105(2/ 2) (0.010- 0.011)	0.0105(2/ 2) (0.010- 0.011)	0
tomato	H-3 Aqueous	3	0.0500	<LLD (0/ 1)	ALL <LLD	-----	<LLD (0/ 2)	0
tomato	H-3 Bound	3	0.5000	<LLD (0/ 1)	ALL <LLD	-----	<LLD (0/ 2)	0
tomato	Sr-90	3	0.0040	<LLD (0/ 1)	ALL <LLD	-----	<LLD (0/ 2)	0

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San Diego County, California

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Table 16 Soil Samples Annual Composite (pCi/g)							
	Ag-110m 5	0.1000	<LLD (0/ 4)	ALL <LLD	-----	<LLD (0/ 1)	0
	Be-7 5	0.3000	<LLD (0/ 4)	ALL <LLD	-----	<LLD (0/ 1)	0
	Ce-141 5	0.1000	<LLD (0/ 4)	ALL <LLD	-----	<LLD (0/ 1)	0
	Ce-144 5	0.1000	<LLD (0/ 4)	ALL <LLD	-----	<LLD (0/ 1)	0
	Co-58 5	0.0500	<LLD (0/ 4)	ALL <LLD	-----	<LLD (0/ 1)	0
	Co-60 5	0.0500	<LLD (0/ 4)	ALL <LLD	-----	<LLD (0/ 1)	0
	I-131 5	0.5000	<LLD (0/ 4)	ALL <LLD	-----	<LLD (0/ 1)	0
	K-40 5	2.0000	13.175(4/ 4) (5.800-17.400)	Huntington Beach Generating Station 37 mi. NW	18(1/ 1) (18.000-18.000)	18(1/ 1) (18.000-18.000)	0
	Ru-103 5	0.1000	<LLD (0/ 4)	ALL <LLD	-----	<LLD (0/ 1)	0

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Table 14 Soil Samples Annual Composite (pCi/g)							
	Sr-90	5	0.0100	0.0300(3/ 4) (0.020- 0.040)	E. Site Boundary 0.2 mi. NNW	0.0400(1/ 1) (0.040- 0.040)	0.0200(1/ 1) (0.020- 0.020)	0
	Zr(Nb)-95	5	0.1000	<LLD (0/ 4)	ALL <LLD	-----	<LLD (0/ 1)	0

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Table 15 Kelp Semi-Annual Composite (pCi/g)							
macrocystis p.	Ag-110m	8	0.0050	<LLD (0/ 5)	ALL <LLD	-----	<LLD (0/ 3)	0
macrocystis p.	Ce-141	8	0.0200	<LLD (0/ 5)	ALL <LLD	-----	<LLD (0/ 3)	0
macrocystis p.	Ce-144	8	0.0200	<LLD (0/ 5)	ALL <LLD	-----	<LLD (0/ 3)	0
macrocystis p.	Co-57	8	0.0050	<LLD (0/ 5)	ALL <LLD	-----	<LLD (0/ 3)	0
macrocystis p.	Co-58	8	0.0040	<LLD (0/ 5)	ALL <LLD	-----	<LLD (0/ 3)	0
macrocystis p.	Co-60	8	0.0040	<LLD (0/ 5)	ALL <LLD	-----	<LLD (0/ 3)	0
macrocystis p.	Cs-134	8	0.0040	<LLD (0/ 5)	ALL <LLD	-----	<LLD (0/ 3)	0
macrocystis p.	Cs-137	8	0.0040	0.0044(4/ 5) (0.004- 0.005)	San Onofre Kelp Bed 1.5 mi. S	0.0045(3/ 3) (0.004- 0.005)	0.0044(1/ 3) (0.004- 0.004)	0
macrocystis p.	Fe-59	8	0.0200	<LLD (0/ 5)	ALL <LLD	-----	<LLD (0/ 3)	0

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Table 15 Kelp Semi-Annual Composite (pCi/g)							
macrocystis p.	H-3 Aqueous 8	0.0500	<LLD (0/ 5)	ALL <LLD	-----	<LLD (0/ 3)	0
macrocystis p.	H-3 Bound 8	0.5000	<LLD (0/ 5)	ALL <LLD	-----	<LLD (0/ 3)	0
macrocystis p.	I-131 8	0.0100	0.1237(3/ 5) (0.056- 0.250)	San Onofre Kelp Bed 1.5 mi. S	0.1575(2/ 3) (0.065- 0.250)	0.0757(3/ 3) (0.049- 0.129)	0
macrocystis p.	K-40 8	0.0400	6.8400(5/ 5) (5.200- 8.300)	San Onofre Kelp Bed 1.5 mi. S	7.8333(3/ 3) (7.600- 8.300)	6.5000(3/ 3) (5.300- 7.300)	0
macrocystis p.	Mn-54 8	0.0050	<LLD (0/ 5)	ALL <LLD	-----	<LLD (0/ 3)	0
macrocystis p.	Mo(Tc)-99m 8	2.0000	<LLD (0/ 5)	ALL <LLD	-----	<LLD (0/ 3)	0
macrocystis p.	Ra-226 8	0.0090	<LLD (0/ 5)	ALL <LLD	-----	<LLD (0/ 3)	0
macrocystis p.	Ru-103 8	0.0090	<LLD (0/ 5)	ALL <LLD	-----	<LLD (0/ 3)	0
macrocystis p.	Ru-106 8	0.0200	<LLD (0/ 5)	ALL <LLD	-----	<LLD (0/ 3)	0

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Table 15 Kelp Semi-Annual Composite (pCi/g)							
macrocystis p.	Th-228	8	0.0090	<LLD (0/ 5)	ALL <LLD	-----	<LLD (0/ 3) 0
macrocystis p.	Zn-65	8	0.0200	<LLD (0/ 5)	ALL <LLD	-----	<LLD (0/ 3) 0
macrocystis p.	Zr(Nb)-95	8	0.0100	<LLD (0/ 5)	ALL <LLD	-----	<LLD (0/ 3) 0
macrocystis P.	Ag-110m	1	0.0050	<LLD (0/ 1)	ALL <LLD	-----	<LLD (0/ 0) 0
macrocystis P.	Ce-141	1	0.0200	<LLD (0/ 1)	ALL <LLD	-----	<LLD (0/ 0) 0
macrocystis P.	Ce-144	1	0.0200	<LLD (0/ 1)	ALL <LLD	-----	<LLD (0/ 0) 0
macrocystis P.	Co-57	1	0.0050	<LLD (0/ 1)	ALL <LLD	-----	<LLD (0/ 0) 0
macrocystis P.	Co-58	1	0.0040	<LLD (0/ 1)	ALL <LLD	-----	<LLD (0/ 0) 0
macrocystis P.	Co-60	1	0.0040	<LLD (0/ 1)	ALL <LLD	-----	<LLD (0/ 0) 0

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Table 15 Kelp Semi-Annual Composite (pCi/g)							
macrocystis P.	Cs-134	1 0.0040	<LLD (0/ 1)	ALL <LLD	-----	<LLD (0/ 0)	0
macrocystis P.	Cs-137	1 0.0040	0.0057(1/ 1) (0.006- 0.006)	San Mateo Kelp Bed 3.5 mi. WNW	0.0057(1/ 1) (0.006- 0.006)	<LLD (0/ 0)	0
macrocystis P.	Fe-59	1 0.0200	<LLD (0/ 1)	ALL <LLD	-----	<LLD (0/ 0)	0
macrocystis P.	H-3 Aqueous	1 0.0500	<LLD (0/ 1)	ALL <LLD	-----	<LLD (0/ 0)	0
macrocystis P.	H-3 Bound	1 0.5000	<LLD (0/ 1)	ALL <LLD	-----	<LLD (0/ 0)	0
macrocystis P.	I-131	1 0.0100	0.2400(1/ 1) (0.240- 0.240)	San Mateo Kelp Bed 3.5 mi. WNW	0.2400(1/ 1) (0.240- 0.240)	<LLD (0/ 0)	0
macrocystis P.	K-40	1 0.0400	6.8000(1/ 1) (6.800- 6.800)	San Mateo Kelp Bed 3.5 mi. WNW	6.8000(1/ 1) (6.800- 6.800)	<LLD (0/ 0)	0
macrocystis P.	Mn-54	1 0.0050	<LLD (0/ 1)	ALL <LLD	-----	<LLD (0/ 0)	0
macrocystis P.	Mo(Tc)-99m	1 2.0000	<LLD (0/ 1)	ALL <LLD	-----	<LLD (0/ 0)	0

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Table 15 Kelp Semi-Annual Composite (pCi/g)							
macrocystis P.	Ra-226	1	0.0090	<LLD (0/ 1)	ALL <LLD	-----	<LLD (0/ 0)	0
macrocystis P.	Ru-103	1	0.0090	<LLD (0/ 1)	ALL <LLD	-----	<LLD (0/ 0)	0
macrocystis P.	Ru-106	1	0.0200	<LLD (0/ 1)	ALL <LLD	-----	<LLD (0/ 0)	0
macrocystis P.	Th-228	1	0.0090	<LLD (0/ 1)	ALL <LLD	-----	<LLD (0/ 0)	0
macrocystis P.	Zn-65	1	0.0200	<LLD (0/ 1)	ALL <LLD	-----	<LLD (0/ 0)	0
macrocystis P.	Zr(Nb)-95	1	0.0100	<LLD (0/ 1)	ALL <LLD	-----	<LLD (0/ 0)	0

APPENDIX C

SUMMARY OF INTERLABORATORY COMPARISONS

Results of Interlaboratory Comparisons For 1986

Date	Sample Type	Analysis Type	Mean EAL ± s. d.	Known EPA ± s. d.	Control Limit	R ± σR
February	Water (pCi/l)	Gamma Emitters				
February	Water	Cr-51	34.66 ± 2.08	38.00 ± 5.00	29.3 - 46.7	0.474
February	Water	Co-60	18.66 ± 0.58	18.00 ± 5.00	9.3 - 26.7	0.118
February	Water	Zn-65	41.66 ± 2.08	40.00 ± 5.00	31.3 - 48.7	0.474
February	Water	Ru-106	27.66 ± 0.58	0.00 ± 5.00	0.0 - 8.7	0.118
February	Water	Cs-134	26.33 ± 0.58	30.00 ± 5.00	21.3 - 38.7	0.118
February	Water	Cs-137	22.00 ± 1.00	22.00 ± 5.00	13.3 - 30.7	0.237
June	Water	Gamma Emitters				
June	Water	Cr-51	< 30.00	0.00 ± 5.00	0.0 - 8.7	---
June	Water	Co-60	64.00 ± 2.00	66.00 ± 5.00	57.3 - 74.7	0.474
June	Water	Zn-65	88.67 ± 4.04	86.00 ± 5.00	77.3 - 94.7	0.948
June	Water	Ru-106	35.00 ± 4.00	50.00 ± 5.00	41.3 - 58.7	0.948
June	Water	Cs-134	42.33 ± 2.08	49.00 ± 5.00	40.3 - 57.7	0.474
June	Water	Cs-137	9.33 ± 0.58	10.00 ± 5.00	1.3 - 18.7	0.118
October	Water	Gamma Emitters				
October	Water	Cr-51	70.67 ± 4.51	59.00 ± 5.00	50.3 - 67.7	0.351
October	Water	Co-60	34.00 ± 0.00	31.00 ± 5.00	22.3 - 39.7	0.000
October	Water	Zn-65	105.66 ± 3.78	85.00 ± 5.00	76.3 - 93.7	0.829
October	Water	Ru-106	67.33 ± 2.51	74.00 ± 5.00	65.3 - 82.7	0.592
October	Water	Cs-134	26.33 ± 2.08	28.00 ± 5.00	19.3 - 36.7	0.474

Date	Sample Type	Analysis Type	Mean EAL + s. d.	Known EPA + s. d.	Control Limit	R + σR
October	Water	Cs-137	46.33 ± 0.58	44.00 ± 5.00	35.3 - 52.7	0.118
April	Water	I-131	10.00 ± 1.00	9.00 ± 6.00	0.0 - 19.4	0.197
August	Water	I-131	43.66 ± 0.58	45.00 ± 6.00	38.1 - 51.9	0.099
December	Water	I-131				
January	Water	Gross Alpha	5.00 ± 1.00	3.00 ± 5.00	0.0 - 11.7	0.237
March	Water	Gross Alpha	16.00 ± 0.00	15.00 ± 5.00	6.3 - 23.7	0.000
May	Water	Gross Alpha	8.00 ± 1.00	8.00 ± 5.00	0.0 - 16.7	0.237
July	Water	Gross Alpha	6.00 ± 1.00	6.00 ± 5.00	0.0 - 16.4	0.237
September	Water	Gross Alpha	16.00 ± 1.00	15.00 ± 5.00	6.3 - 23.7	0.237
November	Water	Gross Alpha	29.33 ± 0.58	20.0 ± 5.00	11.3 - 28.7	0.118
January	Water	Gross Beta	5.00 ± 1.00	7.00 ± 5.00	0.0 - 15.7	0.237
March	Water	Gross Beta	8.33 ± 0.58	8.00 ± 5.00	0.0 - 16.7	0.118
May	Water	Gross Beta	12.00 ± 1.00	15.00 ± 5.00	6.3 - 23.7	0.237
July	Water	Gross Beta	1.00 ± 0.00	18.00 ± 5.00	9.3 - 26.7	0.000
September	Water	Gross Beta	8.67 ± 0.58	8.00 ± 5.00	0.7 - 16.7	0.118
November	Water	Gross Beta	19.00 ± 1.00	20.00 ± 5.00	11.3 - 28.7	0.237
February	Water	Tritium	4836.66 ± 83.88	5227.00 ± 523.00	4321.1 - 6132.9	0.170
April	Water	Tritium	----	----	----	---
June	Water	Tritium	2663.33 ± 46.18	3125.00 ± 360.00	3501.5 - 3748.5	0.131
August	Water	Tritium				

Date	Sample Type	Analysis Type	Mean EAL ± s. d.	Known EPA ± s. d.	Control Limit	R ± σR
October	Water	Tritium	5050.00 ± 43.63	5973.00 ± 597.00	4939.0 - 7067.0	0.079
December	Water	Tritium				
March	Water	Ra-226	4.30 ± 0.17	4.10 ± 0.62	3.0 - 5.2	0.286
June	Water	Ra-226	8.80 ± 0.10	8.60 ± 1.29	6.4 - 10.1	0.092
September	Water	Ra-226	----	6.10 ± 0.92	4.5 - 7.7	---
December	Water	Ra-226	6.60 ± 0.30	6.80 ± 1.02	5.0 - 8.6	0.348
March	Water	Ra-228	11.33 ± 0.41	12.40 ± 1.85	9.2 - 15.6	0.256
June	Water	Ra-228	12.36 ± 0.29	16.70 ± 2.51	12.4 - 21.0	0.118
September	Water	Ra-228	----	9.10 ± 1.37	6.7 - 11.5	---
December	Water	Ra-228	6.63 ± 0.11	11.10 ± 1.67	8.2 - 14.0	0.071
January	Water	Pu-239	7.17 ± 0.20	7.10 ± 0.71	5.9 - 8.3	0.333
August	Water	Pu-239	10.93 ± 0.30	10.10 ± 1.01	8.4 - 11.8	0.352
January	Water	Sr-89	37.66 ± 2.08	31.00 ± 5.00	22.3 - 39.7	0.474
May	Water	Sr-89	4.00 ± 0.00	5.00 ± 5.00	0.0 - 13.7	0.000
September	Water	Sr-89				
January	Water	Sr-90	13.66 ± 0.58	15.00 ± 1.50	12.4 - 17.6	0.395
May	Water	Sr-90	5.00 ± 0.00	5.00 ± 1.50	2.4 - 7.6	0.000
September	Water	Sr-90				
February	Water	U-238	8.67 ± 0.58	9.00 ± 6.00	0.0 - 19.4	0.099
August	Water	U-238	< 1.00	4.00 ± 6.00	0.0 - 14.4	---

Date	Sample Type	Analysis Type	Mean EAL + s. d.	Known EPA + s. d.	Control Limit	R + σR
		(Performance Evaluation)				
April	Water	Gross Alpha	26.00 ± 3.00	17.00 ± 5.00	8.3 - 25.7	0.711
April	Water	Gross Beta	4.133 ± 3.21	35.00 ± 5.00	26.3 - 43.7	0.711
April	Water	Sr-89	6.00 ± 0.00	7.00 ± 5.00	0.0 - 15.7	0.000
April	Water	Sr-90	7.67 ± 0.58	7.00 ± 1.50	4.4 - 9.6	0.395
April	Water	Ra-226	2.90 ± 0.20	2.90 ± 0.44	2.1 - 3.7	0.538
April	Water	Ra-228	2.40 ± 0.20	2.00 ± 0.30	1.5 - 2.5	0.790
April	Water	Co-60	10.00 ± 1.00	10.00 ± 5.00	1.3 - 18.7	0.237
April	Water	Cs-134	4.66 ± 0.58	5.00 ± 5.00	0.0 - 13.7	0.118
April	Water	Cs-137	6.00 ± 1.00	5.00 ± 5.00	0.0 - 13.7	0.237
April	Water	U (nat)	5.33 ± 1.52	5.00 ± 6.00	0.0 - 15.4	0.296
October	Water	Gross Alpha	28.33 ± 1.52	40.00 ± 10.00	22.9 - 57.3	0.177
October	Water	Gross Beta	49.33 ± 1.15	51.00 ± 5.00	42.3 - 59.7	0.237
October	Water	Sr-89	9.00 ± 0.00	10.00 ± 5.00	1.3 - 18.7	0.000
October	Water	Sr-90	4.00 ± 0.00	4.00 ± 1.50	1.4 - 6.6	0.000
October	Water	Ra-226	6.07 ± 0.11	6.00 ± 0.90	4.4 - 7.8	0.131
October	Water	Ra-228	3.86 ± 0.11	5.00 ± 0.75	3.7 - 6.3	0.158
October	Water	Co-60	23.00 ± 1.00	24.00 ± 5.00	15.3 - 32.7	0.237
October	Water	Cs-134	10.00 ± 1.00	12.00 ± 5.00	3.3 - 20.7	0.237
October	Water	Cs-137	8.00 ± 0.00	8.00 ± 5.00	0.0 - 16.7	0.000
October	Water	U	8.00 ± 0.00	10.00 ± 6.00	0.0 - 20.4	0.000

Date	Sample Type	Analysis Type	Mean EAL + s. d.	Known EPA + s. d.	Control Limit	R + σR
April	Air Filter (pCi/Filter)	Gross Alpha	15.33 ± 0.58	15.00 ± 5.00	6.3 - 23.7	0.118
September	Air Filter	Gross Alpha	20.66 ± 0.58	22.00 ± 5.00	13.3 - 30.7	0.355
November	Air Filter	Gross Alpha				
April	Air Filter	Gross Beta	47.66 ± 2.31	47.00 ± 5.00	38.3 - 55.7	0.474
September	Air Filter	Gross Beta	63.67 ± 2.31	66.00 ± 5.00	57.3 - 74.7	0.948
November	Air Filter	Gross Beta				
April	Air Filter	Sr-90	16.66 ± 0.58	18.00 ± 1.50	15.4 - 20.6	0.395
September	Air Filter	Sr-90	19.00 ± 0.00	22.00 ± 1.50	19.4 - 24.6	0.000
November	Air Filter	Sr-90				
April	Air Filter	Cs-137	12.00 ± 0.00	10.00 ± 5.00	1.3 - 18.7	0.000
September	Air Filter	Cs-137	21.66 ± 1.52	22.00 ± 5.00	13.3 - 30.7	0.355
November	Air Filter	Cs-137				
March	Milk (pCi/l)	Sr-89				
March	Milk	Sr-90				
March	Milk	I-131	12.33 ± 0.58	9.00 ± 6.00	0.0 - 19.4	0.099
March	Milk	Cs-137				
March	Milk	Ba-140				
March	Milk	K(mg/l)				
June	Milk	Sr-89	----	----	----	---
June	Milk	Sr-90	39.66 ± 0.58	16.00 ± 1.50	13.4 - 18.6	0.395

Date	Sample Type	Analysis Type	Mean EAL + s. d.	Known EPA + s. d.	Control Limit	R + σR
June	Milk	I-131	35.66 ± 1.15	41.00 ± 6.00	31.6 - 51.4	0.197
June	Milk	Cs-137	37.66 ± 1.15	31.00 ± 5.00	22.3 - 39.7	0.237
June	Milk	Ba-140	----	----	----	---
June	Milk	K(mg/l)	1580.00 ± 20.00	1600.00 ± 80.00	1461.4 - 1738.7	0.296
October	Milk	Sr-89	----	9.00 ± 5.00	0.3 - 17.7	---
October	Milk	Sr-90	< 1.00	0.00 ± 1.50	0.0 - 8.7	---
October	Milk	I-131	52.67 ± 1.15	49.00 ± 6.00	38.6 - 59.4	0.197
October	Milk	Cs-137	41.66 ± 1.52	39.00 ± 5.00	30.3 - 47.7	0.355
October	Milk	K	1515.66 ± 1.53	1565.00 + 78.00	1429.9 - 1700.1	0.022
April	Urine	Tritium	4400.00 ± 100.00	4423.00 ± 442.00	3657.4 - 5188.6	0.268
July	Urine	Tritium				
November	Urine	Tritium	----	5257.80 ± 526.00	4345.9 - 6168.1	---
January	Food (pCi/Kg)	Sr-89	----	25.00 ± 5.00	16.3 - 33.7	---
January	Food	Sr-90	6.67 ± 0.58	10.0 ± 1.50	7.4 - 12.6	0.395
January	Food	Cs-137	16.66 ± 1.52	15.00 ± 5.00	6.3 - 23.7	0.355
January	Food	Ba-140	----	----	----	---
January	Food (mg/Kg)	K	1006.66 ± 11.54	950.00 ± 143.00	702.3 - 1197.7	0.083
January	Food (pCi/Kg)	I-131	24.00 ± 1.00	20.00 ± 6.00	9.6 - 30.4	0.197
July	Food (pCi/Kg)	Sr-89	----	3.00 ± 5.00	21.3 - 38.7	---
July	Food	Sr-90	14.00 ± 1.00	19.00 ± 1.50	16.4 - 21.6	0.790

Date	Sample Type	Analysis Type	Mean EAL ± s. d.	Known EPA ± s. d.	Control Limit	R ± σR
July	Food	Cs-137	20.66 ± 0.58	20.00 ± 5.00	11.3 - 28.7	0.118
July	Food	Ba-140	---	---	---	---
July	Food (mg/Kg)	K	1270.00 ± 26.46	1150.00 ± 58.00	1049.5 - 1250.5	0.511
July	Food (pCi/Kg)	I-131	33.66 ± 2.08	30.00 ± 6.00	19.6 - 40.4	0.395

The results of interlaboratory cross-check program showed that 13% of the samples fell outside the control limit range. The errors were randomly distributed among all different samples and different analyses.

APPENDIX D

MEASUREMENTS EXCEEDING INVESTIGATION LEVELS

RADIOLOGICAL ENVIRONMENTAL MONITORING
MEASUREMENTS EXCEEDING INVESTIGATION LEVELS
1986

Sample Type	Analysis	Table No.	Date	2x Cntrl*	Indicator Location	Concentration		NRC Reporting Levels
Direct Radiation	Thermoluminescence	1A	12/31/86	28.4**	#13	35.4	mrem	none
Direct Radiation	Thermoluminescence	1A	12/31/86	28.4**	#16	30.4	mrem	none
Direct Radiation	Thermoluminescence	1B	12/31/86	121.6**	#55	123.3	mrem	none
Air	Gross Beta	2	04/01/86	0.028	#10	0.360	pCi/m3	none
Air	Gross Beta	2	06/17/86	0.064	#6	0.080	pCi/m3	none
Air	Gross Beta	2	10/28/86	0.040	#11	0.056	pCi/m3	none
Air	Gross Beta	2	10/28/86	0.040	#12	0.048	pCi/m3	none
Air	Gross Beta	2	11/25/86	0.022	#11	0.023	pCi/m3	none
Air	Gross Beta	2	11/25/86	0.022	#12	0.026	pCi/m3	none
Air	Iodine-131	3	05/20/86	1.24	#5	1.49	pCi/m3	0.9 pCi/m3***
Air	Comp. Gross Alpha	4C	12/31/86	0.0006	#11	0.002	pCi/m3	none
Ocean Water	Bimonthly Gross Beta - K-40	6	03/04/86	12	Unit 1	14	pCi/l	none
Ocean Water	Composite H-3	7	09/30/86	200	Unit 1	2200	pCi/l	none
Drinking Water	Gross Beta in Solids	9B	01/09/86	0.2	Tri-Cities MWD	0.8	pCi/l	none
Drinking Water	Gross Beta in Solids	9B	02/06/86	0.8	San Clemente Golf Course	9.8	pCi/l	none
Drinking Water	Gross Alpha in Solids	9B	02/06/86	0.4	San Clemente Golf Course	2.0	pCi/l	none

* If no positive value is detected, then twice the lower limit of detection is used as the criterion for comparison of indicator and control locations.
** Number indicates 1.25 times control.
***The high radioiodine concentrations were a result of the Chernobyl nuclear power plant accident. See text in Section II.B for details.

RADIOLOGICAL ENVIRONMENTAL MONITORING
MEASUREMENTS EXCEEDING INVESTIGATION LEVELS (Continued)
1986

Sample Type	Analysis	Table No.	Date	2x Cntrl*	Indicator Location	Concentration		NRC Reporting Levels
Drinking Water	Gross Alpha in Solids	9B	03/06/86	0.4	San Clemente Golf Course	0.6	pCi/l	none
Drinking Water	Gross Beta in Solids	9B	03/06/86	0.2	San Clemente Golf Course	1.7	pCi/l	none
Drinking Water	Gross Alpha in Solids	9B	05/09/86	0.4	San Clemente Golf Course	2.8	pCi/l	none
Drinking Water	Gross Beta in Solids	9B	05/09/96	0.2	San Clemente Golf Course	12.4	pCi/l	none
Drinking Water	Gross Beta in Solids	9B	05/09/86	0.2	Tri-Cities MWD	0.4	pCi/l	none
Drinking Water	Gross Alpha in Solids	9B	06/04/86	0.4	San Clemente Golf Course	1.0	pCi/l	none
Drinking Water	Gross Beta in Solids	9B	06/04/86	0.2	Tri-Cities MWD	3.1	pCi/l	none
Drinking Water	Gross Alpha in Solids	9B	07/10/86	0.4	San Clemente Golf Course	3.3	pCi/l	none
Drinking Water	Gross Beta in Solids	9B	07/10/86	0.2	Tri-Cities MWD	28	pCi/l	none
Drinking Water	Gross Alpha in Solids	9B	08/08/86	0.4	San Clemente Golf Course	1.2	pCi/l	none
Drinking Water	Gross Beta in Solids	9B	08/08/86	0.2	Tri-Cities MWD	1.0	pCi/l	none
Drinking Water	Gross Beta in Solids	9B	08/08/86	0.2	San Clemente Golf Course	1.1	pCi/l	none
Drinking Water	Gross Alpha in Solids	9B	09/10/86	0.4	San Clemente Golf Course	0.8	pCi/l	none
Drinking Water	Gross Beta in Solids	9B	09/10/86	0.2	Tri-Cities MWD	0.5	pCi/l	none
Drinking Water	Gross Beta in Solids	9B	09/10/86	0.2	San Clemente Golf Course	4.0	pCi/l	none

* If no positive value is detected, then twice the lower limit of detection is used as the criterion for comparison of indicator and control locations.

RADIOLOGICAL ENVIRONMENTAL MONITORING
MEASUREMENTS EXCEEDING INVESTIGATION LEVELS (Continued)
1986

Sample Type	Analysis	Table No.	Date	2x Cntrl*	Indicator Location	Concentration		NRC Reporting Levels
Drinking Water	Gross Alpha in Solids	9B	10/09/86	0.4	San Clemente Golf Course	0.5	pCi/l	none
Drinking Water	Gross Beta in Solids	9B	10/09/86	0.2	Tri-Cities MWD	0.6	pCi/l	none
Drinking Water	Gross Beta in Solids	9B	10/09/86	0.2	San Clemente Golf Course	1.9	pCi/l	none
Drinking Water	Gross Alpha in Solids	9B	11/06/86	0.4	San Clemente Golf Course	0.5	pCi/l	none
Drinking Water	Gross Beta in Solids	9B	11/06/86	0.2	San Clemente Golf Course	1.8	pCi/l	none
Drinking Water	Gross Alpha in Solids	9B	12/08/86	0.4	San Clemente Golf Course	0.8	pCi/l	none
Drinking Water	Gross Beta in Solids	9B	12/08/86	0.2	Tri-Cities MWD	0.3	pCi/l	none
Drinking Water	Gross Beta in Solids	9B	12/08/86	0.2	San Clemente Golf Course	2.4	pCi/l	none
Drinking Water	Gross Beta in Filtrates	9C	02/06/86	12	San Clemente Golf Course	14	pCi/l	none
Drinking Water	Gross Beta in Filtrates	9C	03/06/86	16	San Clemente Golf Course	20	pCi/l	none
Drinking Water	Gross Beta in Filtrates	9C	05/09/86	14	San Clemente Golf Course	24	pCi/l	none
Drinking Water	Gross Alpha in Filtrates	9C	07/10/86	0.4	San Clemente Golf Course	10	pCi/l	none
Drinking Water	Gross Beta in Filtrates	9C	08/08/86	12	Tri-Cities MWD	16	pCi/l	none
Drinking Water	Gross Beta in Filtrates	9C	08/08/86	12	San Clemente Golf Course	14	pCi/l	none
Drinking Water	Gross Beta in Filtrates	9C	09/10/86	14	San Clemente Golf Course	15	pCi/l	none

* If no positive value is detected, then twice the lower limit of detection is used as the criterion for comparison of indicator and control locations.

RADIOLOGICAL ENVIRONMENTAL MONITORING
MEASUREMENTS EXCEEDING INVESTIGATION LEVELS (Continued)
1986

Sample Type	Analysis	Table No.	Date	2x Cntrl*	Indicator Location	Concentration		NRC Reporting Levels
Drinking Water	Gross Beta in Filtrates	9C	10/09/86	14	San Clemente Golf Course	16	pCi/l	none
Drinking Water	Comp. Gross Alpha, Solids	9D	03/31/86	0.4	San Clemente Golf Course	1.2	pCi/l	none
Drinking Water	Comp. Gross Beta, Solids	9D	03/31/86	0.2	Tri-Cities MWD	0.6	pCi/l	none
Drinking Water	Comp. Gross Beta, Solids	9D	03/31/86	0.2	Tri-Cities MWD	6.7	pCi/l	none
Drinking Water	Comp. Gross Alpha, Solids	9D	06/30/86	0.4	San Clemente Golf Course	1.2	pCi/l	none
Drinking Water	Comp. Gross Beta, Solids	9D	06/30/86	0.2	Tri-Cities MWD	0.4	pCi/l	none
Drinking Water	Comp. Gross Beta, Solids	9D	06/30/86	0.2	San Clemente Golf Course	4.6	pCi/l	none
Drinking Water	Comp. Gross Alpha, Solids	9D	09/30/86	0.4	San Clemente Golf Course	1.1	pCi/l	none
Drinking Water	Comp. Gross Beta, Solids	9D	09/30/86	0.6	Tri-Cities MWD	0.7	pCi/l	none
Drinking Water	Comp. Gross Beta, Solids	9D	09/30/86	0.6	San Clemente Golf Course	10.1	pCi/l	none
Drinking Water	Comp. Gross Alpha, Solids	9D	12/31/86	0.4	San Clemente Golf Course	0.7	pCi/l	none
Drinking Water	Comp. Gross Beta, Solids	9D	12/31/86	0.2	Tri-Cities MWD	0.5	pCi/l	none
Drinking Water	Comp. Gross Beta, Solids	9D	12/31/86	0.2	San Clemente Golf Course	2.7	pCi/l	none
Drinking Water	Comp. Gross Beta, Filtrate	9E	03/31/86	14	San Clemente Golf Course	20	pCi/l	none
Drinking Water	Comp. Gross Alpha, Filtrate	9E	06/30/86	0.4	San Clemente Golf Course	7	pCi/l	none

* If no positive is value detected, then twice the lower limit of detection is used as the criterion for comparison of indicator and control locations.

RADIOLOGICAL ENVIRONMENTAL MONITORING
MEASUREMENTS EXCEEDING INVESTIGATION LEVELS (Continued)
1986

Sample Type	Analysis	Table No.	Date	2x Cntrl*	Indicator Location	Concentration		NRC Reporting Levels
Drinking Water	Comp. Gross Beta, Filtrate	9E	09/30/86	16	San Clemente Golf Course	17	pCi/g	none
Marine Species (Sheephead)	Cobalt-60	12A	03/04/86	0.014	Unit 1	0.027	pCi/g	10
Marine Species (Sheephead)	Cesium-137	12A	03/04/86	0.0106	Unit 1	0.022	pCi/g	2
Marine Species (Bay Mussel)	Cobalt-60	12A	03/05/86	0.0042	Unit 1	0.011	pCi/g	10
Marine Species (Bay Mussel)	Cobalt-60	12A	03/04/86	0.0042	Units 2/3	0.007	pCi/g	10
Marine Species (Sheephead)	Cobalt-60	12A	05/21/86	0.014	Unit 1	0.046	pCi/g	10
Marine Species (Sheephead)	Cesium-137	12A	05/21/86	0.0086	Unit 1	0.035	pCi/g	2
Marine Species (Sheephead)	Cesium-137	12A	05/21/86	0.0086	Units 2/3	0.0104	pCi/g	2
Marine Species (Sea Hare)	Cobalt-60	12A	05/25/86	0.014	Unit 1	0.041	pCi/g	10
Marine Species (Spiny Lobster)	Cobalt-60	12A	08/06/86	0.014	Unit 1	0.017	pCi/g	10
Marine Species (Sea Hare)	Cobalt-58	12A	08/19/86	0.02	Unit 1	0.046	pCi/g	30
Marine Species (Sea Hare)	Cobalt-60	12A	08/19/86	0.004	Unit 1	0.084	pCi/g	10
Marine Species (Bay Mussel)	Cobalt-60	12A	08/06/86	0.004	Units 2/3	0.019	pCi/g	10
Marine Species (Sea Hare)	Cobalt-58	12A	11/04/86	0.02	Unit 1	0.026	pCi/g	30
Marine Species (Sea Hare)	Cobalt-60	12A	11/04/86	0.014	Unit 1	0.136	pCi/g	10

* If no positive value is detected, then twice the lower limit of detection is used as the criterion for comparison of indicator and control locations.

RADIOLOGICAL ENVIRONMENTAL MONITORING
MEASUREMENTS EXCEEDING INVESTIGATION LEVELS (Continued)
1986

Sample Type	Analysis	Table No.	Date	2x Cntrl*	Indicator Location	Concentration	NRC Reporting Levels
Ocean Bottom Sediment	Cobalt-60	11	05/12/86	0	Unit 1 East	0.060 pCi/g	none
Ocean Bottom Sediment	Radium-226	11	05/12/86	0.44	Unit 1 East	0.560 pCi/g	none
Soil (Surface)	Cesium-137	14	12/17/86	0.10	Camp San Onofre	0.110 pCi/g	none
Soil (3 inch depth)	Strontium-90	14	12/17/86	0.04	Old Route 101	0.05 pCi/g	none
Soil (3 inch depth)	Cesium-137	14	12/17/86	0.14	Old Route 101	0.18 pCi/g	none

* If no positive value is detected, then twice the lower limit of detection is used as the criterion for comparison of indicator and control locations.

APPENDIX E

HISTORICAL TRENDING

SOIL

Soil samples are collected annually from Basilone Road, the East Site Boundary, Camp San Onofre, Old Highway 101 (which served as indicator locations), and from Huntington Beach (which served as the control location). The samples are subsequently analyzed for 13 naturally-occurring and Station-related radionuclides. From 1981 through 1986, five radionuclides were detected in soil, namely: potassium-40, strontium-90, cesium-137, radium-226, and thorium-232. Concentrations of these radionuclides in soil are presented in Table E-1.

Three of the five radionuclides detected in the soil samples are naturally-occurring (i.e., non-Station related). They include potassium-40, radium-226, and thorium-232. The measured concentrations of these radionuclides vary from year to year at a given location, and to a greater extent between locations.

Strontium-90, a naturally-occurring Station-related radionuclide has been detected in 15 out of 24 samples collected from the indicator locations. The concentrations of strontium-90 in these samples collected from the indicator locations have ranged from below detectability to 0.05 pCi/g, dry weight. Strontium-90 has also been detected in two out of four samples collected from the control location. The concentrations of strontium-90 in samples collected from the control location have ranged from below detectability to 0.02 pCi/g, dry weight. Strontium-90 has been detected most frequently in samples collected from Camp San Onofre and from Old Highway 101.

Cesium-137, a naturally-occurring/Station-related radionuclide has been detected in half of the samples collected from the indicator locations. The concentrations of cesium-137 in these samples have ranged from below detectability to 0.15 pCi/g, dry weight. Cesium-137 has also been detected in half of the samples collected from the control location. The concentrations of cesium-137 in these samples have ranged from below detectability to 0.12 pCi/g, dry weight. In 1981, the concentrations of cesium-137 in three samples from the indicator locations exceeded the concentration of cesium-137 at the control location. Since then, the concentrations of cesium-137 detected in samples from the indicator locations have fluctuated above and below the concentrations of cesium-137 measured in samples from the control location. There is also no indication that cesium-137 is accumulating in soil samples from either the indicator or control locations. Cesium-137 has been detected most frequently in samples collected from Camp San Onofre and from Old Highway 101.

Over the past six years, minute amounts of naturally-occurring and Station-related radionuclides have been detected in soil samples collected near San Onofre and in Huntington Beach. There were detectable differences in the amounts of naturally-occurring potassium-40, radium-226, and thorium-232 seen in samples collected from each of the locations. The difference in the levels, however, is considered indicative of this particular environment. Strontium-90 and cesium-137 were also detected in samples from both the indicator and control locations at different frequencies, in a narrow concentration range. Although detectable, there is no indication that either strontium-90 or cesium-137 is accumulating in the soil near San Onofre.

TABLE E-1

CONCENTRATIONS OF RADIONUCLIDES DETECTED IN SOIL#
1981 - 1986

Camp San Onofre	1981	1982	1983	1984	1985	1986
Potassium-40	*	23.0	20.0	21.0	15.0	17.4
Strontium-90	0.02	0.04	0.02	0.04	<LLD	0.03
Cesium-137	0.15	0.02	0.05	0.14	<LLD	0.11
Radium-226	0.58	0.76	*	*	*	*
Thorium-232	0.60	0.77	*	*	*	*
Old Highway 101						
Potassium-40	*	7.0	6.6	6.2	6.3	5.8
Strontium-90	0.05	0.05	0.03	0.02	0.03	0.02
Cesium-137	0.13	0.03	<LLD	0.04	0.08	0.03
Radium-226	0.30	0.38	*	*	*	*
Thorium-232	0.37	0.47	*	*	*	*
Basilone Road						
Potassium-40	*	16.2	12.0	17.3	20.0	14.4
Strontium-90	<LLD	0.02	<LLD	<LLD	<LLD	<LLD
Cesium-137	<LLD	<LLD	<LLD	<LLD	0.04	<LLD
Radium-226	0.93	0.46	*	*	*	*
Thorium-232	0.83	0.61	*	*	*	*
East Site Boundary						
Potassium-40	*	11.3	16.6	13.8	12.3	15.1
Strontium-90	<LLD	0.02	<LLD	<LLD	0.02	0.04
Cesium-137	0.05	<LLD	<LLD	<LLD	<LLD	<LLD
Radium-226	0.68	0.5	*	*	*	*
Thorium-232	1.11	0.66	*	*	*	*
Huntington Beach						
Potassium-40	*	21.0	22.0	18.9	19.0	18.0
Strontium-90	<LLD	0.02	<LLD	<LLD	<LLD	0.02
Cesium-137	<LLD	0.12	0.07	0.12	<LLD	<LLD
Radium-226	0.53	0.68	*	*	*	*
Thorium-232	0.73	1.37	*	*	*	*

Abbreviations:
- concentrations listed are in units of pCi/g, dry weight
* - a radionuclide not determined in the analysis
<LLD - less than the lower limit of detection

SHORELINE SEDIMENT (SAND)

Shoreline sediment samples are collected semiannually from San Onofre State Beach (0.5 and 3.5 miles southeast of SONGS) and San Onofre Surfing Beach (which serve as indicator locations) as well as from Newport Beach (which serves as the control location). The samples are subsequently analyzed for 19 naturally-occurring and Station-related radionuclides. From 1981 through 1986, four radionuclides were detected in sand, namely: potassium-40, cesium-137, radium-226, and thorium-232. See Table E-2.

Three of the four radionuclides detected in shoreline sediment are naturally-occurring (i.e., non-Station related). They include potassium-40, radium-226, and thorium-232. All three of these radionuclides were present in each sample in detectable amounts. The measured concentrations of these radionuclides, however, vary from year to year at a given location, and to a greater extent between locations.

Cesium-137, a naturally-occurring/Station-related radionuclide, was detected in one sample out of 36 samples collected from the indicator locations over the past six years. Specifically, cesium-137 was detected in February 1981 in a sand sample collected from San Onofre State Beach (0.5 miles south of Unit 1). The concentration of cesium-137 in this sample was 0.02 pCi/g, dry weight. Cesium-137 has not been detected in any samples collected from the control location during this same time frame.

Over the past six years, both naturally-occurring and Station-related radionuclides have been detected in varying amounts and at different frequencies in sand samples collected from both the indicator and control locations. The difference in levels of potassium-40, radium-226, and thorium-232 is considered a characteristic of this particular environment. There is also no indication that cesium-137 is accumulating in the environment since it has stayed below detection limits for the past five years.

TABLE E-2

CONCENTRATIONS OF RADIONUCLIDES DETECTED IN SAND#
1981 - 1986

	Feb 81	Sep 81	Apr 82	Oct 82	Apr 83	Sep 83	Apr 84	Sep 84	Apr 85	Sep 85	Apr 86	Sep 86
0.5 Miles South of Unit 1												
Potassium-40	*	*	18	13	14	13.2	11.6	13.6	11.9	10.6	12.9	14.5
Cesium-137	0.02	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Radium-226	0.44	0.88	0.18	0.45	0.19	0.26	0.81	0.21	0.31	0.37	0.17	0.20
Thorium-232	0.42	0.8	0.18	0.33	0.18	0.24	1.05	0.22	0.26	0.32	0.14	0.21
San Onofre Surfing Beach												
Potassium-40	*	*	17.0	15.0	13.1	14.1	13.5	12.7	13.0	12.0	13.3	16.8
Radium-226	0.17	0.23	0.57	0.18	0.24	0.59	0.28	0.17	0.39	0.22	0.37	0.12
Thorium-232	0.18	0.27	0.87	0.20	0.25	0.72	0.36	0.18	0.48	0.27	0.40	0.14
South San Onofre State Beach												
Potassium-40	*	*	15.0	16.0	13.5	13.4	11.4	15.8	13.6	13.4	15.5	13.1
Radium-226	0.17	0.17	0.14	0.16	0.13	0.31	0.64	0.12	0.73	0.15	0.14	0.15
Thorium-232	0.11	0.14	0.12	0.14	0.14	0.21	0.43	0.13	1.07	0.20	0.12	0.14
Newport Beach												
Potassium-40	*	*	20.0	15.0	17.8	17.4	17.6	20.0	17.2	15.3	17.9	17.9
Radium-226	0.28	0.55	0.54	1.27	0.26	0.46	0.63	0.24	0.52	0.52	0.37	0.25
Thorium-232	0.71	1.26	1.53	3.8	0.80	1.28	2.1	0.45	1.43	2.0	1.00	0.46

Abbreviations:
- concentrations listed are in units of pCi/g, wet weight
* - a radionuclide not determined in the analysis
<LLD - less than the lower limit of detection

AIRBORNE PARTICULATES

Each week air samples are collected from a number of indicator locations, and from a control location situated in Huntington Beach. The samples are subsequently analyzed for gross beta activity. From 1981 through 1986, 152 air samples were collected from the indicator locations, and 24 samples were collected from Huntington Beach, and were subsequently analyzed for gross beta activity. The results indicate that gross beta activity was detected in each sample. Average quarterly gross beta activity for this time frame is presented in Table E-3.

To determine whether or not there are any trends toward increasing gross beta activities with time, calculated gross average quarterly gross beta activities from each indicator location were compared to equivalent data from Huntington Beach. Over the past six years, the average quarterly gross beta activities measured in San Clemente have been consistently below the levels measured in samples from Huntington Beach. Average quarterly gross beta activities measured at the other indicator locations, however, have fluctuated unpredictably (within a factor of two) above, and below the levels measured in samples from Huntington Beach. Only one sample collected from air sample location 10 (Bluff) during the first quarter of 1986 has exceeded a preliminary investigation level (i.e., twice the level measured at the control location). The gross beta activity measured in the sample of 0.046 pCi/m3. The gross beta activity measured in the sample from the control location was 0.021 pCi/m3.

A review of the data indicates that there are no trends toward increasing levels of gross beta activity in the air near SONGS, and that the operations of SONGS have had a negligible detectable impact on this environmental medium.

TABLE E-3

GROSS BETA ACTIVITY DETECTED IN AIR#
1981 -1986

Year	Quarter	Huntington Beach	San Clemente	Camp San Onofre	Visitor Center	Units 2/3 Switchyard	Met Tower	S.Beach Park	Bluff	Mesa E.O.F.	Evaporation Pond
1981	1	0.150	0.120	0.122	0.217	0.200	*	*	*	*	*
1981	2	0.163	0.083	0.075	0.231	0.238	*	*	*	*	*
1981	3	0.058	0.040	0.032	0.062	0.067	*	*	*	*	*
1981	4	0.039	0.028	0.023	0.044	0.067	*	*	*	*	*
1982	1	0.021	0.018	0.018	0.021	0.023	0.020	*	*	*	*
1982	2	0.020	0.018	0.017	0.020	0.020	0.018	*	*	*	*
1982	3	0.018	0.016	0.016	0.018	0.019	0.018	*	*	*	*
1982	4	0.023	0.019	0.020	0.024	0.028	0.025	*	*	*	*
1983	1	0.015	0.012	0.013	0.014	0.014	0.016	*	*	*	*
1983	2	0.014	0.012	0.015	0.015	0.014	0.014	*	*	*	*
1983	3	0.017	0.015	0.019	0.018	0.019	0.019	*	*	*	*
1983	4	0.025	0.018	0.021	0.020	0.022	0.020	*	*	*	*
1984	1	0.029	0.017	0.023	0.027	0.031	0.023	0.025	0.028	0.029	*
1984	2	0.016	0.013	0.016	0.018	0.016	0.017	0.019	0.019	0.019	*
1984	3	0.016	0.016	0.019	0.019	0.019	0.016	0.016	0.023	0.019	*
1984	4	0.019	0.016	0.020	0.021	0.021	0.019	0.019	0.020	0.022	*
1985	1	0.023	0.020	0.023	0.024	0.023	0.022	0.019	0.020	0.026	*
1985	2	0.015	0.014	0.015	0.015	0.016	0.015	0.016	0.015	0.020	*
1985	3	0.016	0.014	0.018	0.018	0.018	0.016	0.016	0.017	0.019	*
1985	4	0.028	0.020	0.025	0.025	0.026	0.021	0.024	0.026	0.028	*
1986	1	0.021	0.017	0.022	0.019	0.020	0.019	0.019	0.046	0.029	*
1986	2	0.114	0.101	0.103	*	0.144	0.106	0.101	0.110	0.123	0.133
1986	3	0.026	0.024	0.030	*	0.031	0.027	0.027	0.027	0.031	0.033
1986	4	0.032	0.026	0.035	*	0.032	0.032	0.030	0.023	0.035	0.036

Abbreviations:
- concentrations listed are in units of pCi/m^3
* - gross beta activity not determined

CROPS

Over the past six years, 48 samples of representative fresh and leafy vegetables were collected at harvest time from the San Mateo and/or San Clemente canyons (which serve as indicator locations), and a control location situated SSE Oceanside (which served as the control location). Upon collection, the samples were analyzed for 12 naturally-occurring, and Station-related gamma-emitting radionuclides, for strontium-90, and for aqueous and bound tritium. Radionuclides detected during this time include beryllium-7, potassium-40, strontium-90, and organically-bound tritium. A summary of the radioanalytical data is presented in Table E-4.

Beryllium-7, a naturally-occurring, non-Station related radionuclide has been noted in a few samples collected from both the indicator and control locations. Beryllium-7 was detected in cauliflower and cucumber samples collected from the indicator locations at concentrations of 0.06 pCi/g, wet weight. Beryllium-7 was also detected in two kale samples and a sample of squash from the control location at concentrations ranging from 0.06 to 0.08 pCi/g, wet weight.

Potassium-40, another naturally-occurring, non-Station related radionuclide was detected in all of the samples collected from both the indicator and control locations over the past few years. Over the past six years, the potassium-40 levels, with one exception, have fluctuated within a factor of two above, and below the levels measured in samples collected from the control location.

Strontium-90 was detected in samples collected from both the indicator and control locations over the past six years. Strontium-90 was seen in one sample collected from the indicator locations, and in eight samples collected from SSE of Oceanside. The concentration of strontium-90 in the cauliflower sample collected from the San Mateo Canyon was 0.007 pCi/g, wet weight. The concentration of strontium-90 in the kale and parsley samples collected from SSE Oceanside ranged from 0.010 to 0.09 pCi/g, wet weight. Interestingly, strontium-90 is seen most frequently in kale samples.

Organically-bound tritium was also detected in samples collected from the San Mateo Canyon and SSE of Oceanside in June 1984. The concentrations of organically-bound tritium in the tomato and cucumber samples collected from the San Mateo Canyon were 0.52 and 0.4 pCi/g, wet weight, respectively. The concentrations of strontium-90 in tomatoes and green bean samples collected from SSE Oceanside were 0.5 and 2.1 pCi/g, wet weight, in that order.

Finally, cesium-137, a naturally-occurring and SONGS-related radionuclide, was detected in a total of four samples collected from SSE of Oceanside during June 1983, September 1983, and again in June 1986. The concentration of cesium-137 in these samples ranged from 0.0072 to 0.0400 pCi/g, wet weight. Cesium-137 was not detected in any of the samples collected from the indicator locations.

Several radionuclides were present in minute amounts in crops near SONGS over the past few years. The detectable differences in the amounts of beryllium-7 and potassium-40 seen in the samples are considered characteristic of this environment. Because the levels of strontium-90 and cesium-137 and organically-bound tritium in the samples from the control locations are seen more frequently in samples collected from the control location, the presence of the radionuclides is most likely due to fallout from nuclear weapons testing, and not from Station operations. From this, it was concluded that the operations of SONGS has had a negligible detectable effect on this environmental medium.

TABLE E-4

CONCENTRATIONS OF RADIONUCLIDES DETECTED IN LOCAL CROPS#
1981 - 1986

Date	Sample Type	Location	Beryllium-7	Potassium-40	Strontium-90	Bound Tritium
Jun 81	Tomatoes	San Clemente/	*	*	<LLD	<LLD
Jun 81	Cabbage	San Mateo	*	*	<LLD	<LLD
Sep 81	Corn	Canyons	*	*	<LLD	<LLD
Sep 81	Cucumber	"	*	*	<LLD	<LLD
Jun 82	Tomatoes	"	<LLD	2.2	<LLD	<LLD
Jun 82	Cucumber	"	<LLD	1.8	<LLD	<LLD
Dec 82	Tomatoes	"	<LLD	2.1	<LLD	<LLD
Dec 82	Cauliflr	"	0.06	2.8	0.007	<LLD
Jun 83	Tomatoes	"	<LLD	2.3	<LLD	<LLD
Jun 83	Cucumber	"	<LLD	1.6	<LLD	<LLD
Sep 83	Tomatoes	"	<LLD	2.1	<LLD	<LLD
Sep 83	Cucumber	"	<LLD	1.7	<LLD	<LLD
Jun 84	Tomatoes	"	<LLD	2.2	<LLD	0.52
Jun 84	Cucumber	"	<LLD	1.5	<LLD	0.4
Sep 84	Tomatoes	"	<LLD	1.8	<LLD	<LLD
Sep 84	Cucumber	"	0.06	1.7	<LLD	<LLD
Jun 85	Cucumber	"	<LLD	1.3	<LLD	<LLD
Jun 85	Cauliflr	"	<LLD	1.7	<LLD	<LLD
Sep 85	Cucumber	"	<LLD	1.7	<LLD	<LLD
Sep 85	Tomatoes	"	<LLD	1.9	<LLD	<LLD
Jun 86	Cucumber	"	<LLD	1.08	<LLD	<LLD
Jun 86	Corn	"	<LLD	15.4	<LLD	<LLD
Nov 86	Cauliflr	"	<LLD	2.2	<LLD	<LLD
Nov 86	Tomatoes	"	<LLD	1.9	<LLD	<LLD

Abbreviations:
- concentrations listed are in units of pCi/g, wet weight
* - a radionuclide not determined in the analysis
<LLD - less than the lower limit of detection

TABLE E-4 (Continued)

CONCENTRATIONS OF RADIONUCLIDES DETECTED IN LOCAL CROPS#
1981 - 1986

Date	Sample Type	Location	Beryllium-7	Potassium-40	Strontium-90	Bound Tritium	Cesium-137
Jun 81	Tomatoes	SSE Oceanside	*	*	<LLD	<LLD	<LLD
Jun 81	Parsley	"	*	*	0.09	<LLD	<LLD
Sep 81	Tomatoes	"	*	*	<LLD	<LLD	<LLD
Sep 81	Parsley	"	*	*	<LLD	<LLD	<LLD
Jun 82	Tomatoes	"	<LLD	1.8	<LLD	<LLD	<LLD
Jun 82	Kale	"	<LLD	2.1	0.027	<LLD	<LLD
Dec 82	Tomatoes	"	<LLD	1.9	<LLD	<LLD	<LLD
Dec 82	Kale	"	0.06	1.6	0.014	<LLD	<LLD
Jun 83	Tomatoes	"	<LLD	2.6	<LLD	<LLD	<LLD
Jun 83	Kale	"	0.08	3.1	0.026	<LLD	0.0400
Sep 83	Kale	"	<LLD	1.8	0.018	<LLD	0.0072
Sep 83	Tomatoes	"	<LLD	2.2	<LLD	<LLD	<LLD
Jun 84	Tomatoes	"	<LLD	1.5	<LLD	0.5	<LLD
Jun 84	Grn Beans	"	<LLD	2.0	<LLD	2.1	<LLD
Sep 84	Kale	"	<LLD	1.0	0.015	<LLD	<LLD
Sep 84	Tomatoes	"	<LLD	2.0	<LLD	<LLD	<LLD
Jun 85	String Beans	"	<LLD	1.5	<LLD	<LLD	<LLD
Jun 85	Squash	"	0.08	1.7	<LLD	<LLD	<LLD
Sep 85	Tomatoes	"	<LLD	1.8	<LLD	<LLD	<LLD
Sep 85	Kale	"	<LLD	1.7	<LLD	<LLD	<LLD
Jun 86	Kale	"	<LLD	2.8	0.010	<LLD	0.0037
Jun 86	Tomatoes	"	<LLD	1.6	<LLD	<LLD	0.010
Nov 86	Tomatoes	"	<LLD	1.17	<LLD	<LLD	<LLD
Nov 86	Kale	"	<LLD	2.6	0.011	<LLD	<LLD

Abbreviations:
- concentrations listed are in units of pCi/g, wet weight
* - a radionuclide not determined in the analysis
<LLD - less than the lower limit of detection

KELP

Harvestable kelp is collected semiannually from the San Onofre Kelp Bed, the San Mateo Kelp Bed, and from a kelp bed situated in Newport Beach. Because of its atrophied condition, kelp is not collected from the Barn Kelp Bed near SONGS. Once collected, the kelp is analyzed for 19 naturally-occurring and Station-related gamma-emitting radionuclides, and for aqueous and bound tritium. Radionuclides that have been detected in kelp over the past six years include potassium-40, cobalt-58, cobalt-60, zirconium (niobium)-95, iodine-131, and cesium-137. Concentrations of these radionuclides are presented in Table E-5.

Potassium-40, a naturally-occurring (i.e., non-Station related) radionuclide has been detected in all of the samples analyzed to date. Over the past six years, the potassium-40 levels, with one exception, have fluctuated (within a factor of two above), and below the levels measured in samples collected from the control location.

Since 1981, cobalt-58, a Station-related radionuclide, has been below detection limits in samples collected from both the San Onofre and San Mateo Kelp Beds, with the exception of the samples collected from the San Onofre Kelp Bed in 1984. Cobalt-58 has been below detection limits, however, in all samples collected from the control location.

From 1981 through 1986, cobalt-60, another Station-related radionuclide, was noted in San Onofre Kelp Bed samples collected in June 1981, and in each semiannual sampling during 1984 and 1985. Cobalt-60 was also seen in San Mateo Kelp Bed samples in June 1981, and in May and November 1984, and again in May 1985. Cobalt-60, on the other hand, was only detected in one sample collected from Newport Beach during May 1985.

From 1981 to 1986, iodine-131, another Station-related radionuclide, has been found in the majority of samples collected from the San Onofre and San Mateo Kelp Beds, and in kelp collected from Newport Beach. With the exception of five samples, the concentrations of iodine-131 measured in samples from the indicator locations have been within a factor of two of the iodine-131 concentrations measured in samples from the control location (or where applicable, twice the lower limit of detection of iodine-131). The five samples where the measured concentration of iodine-131 exceeded the preliminary investigation levels (or twice background levels) were collected during the time frame of November 1983 and May 1985.

Cesium-137, a naturally-occurring and Station-related radionuclide, was below detection limits in the samples collected from the San Onofre and San Mateo Kelp Beds, and from Newport Beach from 1981 through 1983. Since then, cesium-137 has been detected in all but one sample collected from the San Onofre and San Mateo Kelp Beds. Cesium-137 has also been detected in three of the samples collected from Newport Beach. With the exception of one sample, the concentrations of cesium-137 measured in samples from the indicator

locations have been within a factor of two of the iodine-131 concentrations measured in samples from the control location (or where applicable, twice the lower limit of detection of cesium-137). The one sample where the measured concentration of cesium-137 just exceeded the preliminary investigation levels (or twice background levels) was collected in May 1985.

In examining data collected over the past six years, there is no evidence that any naturally-occurring or Station-related radionuclides are accumulating in kelp near San Onore although a few measured concentrations exceeded preliminary investigation levels. The detectable amounts of cesium-137 and iodine-131 in the kelp obtained from Newport Beach may be due to SONGS operations. This is due to the fact that there is a weak intermittment north current (0.5 knots). Hospitals are another potential source of iodine-131.

TABLE E-5

CONCENTRATIONS OF RADIONUCLIDES DETECTED IN KELP#
1981 - 1986

	Jun 81	Dec 81	Jun 82	Oct 82	May 83	Nov 83	May 84	Nov 84	May 85	Nov 85	May 86	Jun 86	Nov 86
San Onofre Kelp Bed													
Potassium-40	*	*	5.2	5.5	4.6	6.7	6.5	7.4	9.0	3.5	7.6	8.3	7.6
Cobalt-58	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	0.007	0.012	<LLD	<LLD	<LLD	<LLD	<LLD
Cobalt-60	0.005	<LLD	<LLD	<LLD	<LLD	<LLD	0.056	0.017	0.0037	0.0042	<LLD	<LLD	<LLD
Zirconium (Niobium)-95	0.080	*	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Iodine-131	0.006	<LLD	<LLD	<LLD	0.053	0.033	0.22	0.105	0.054	0.008	0.25	0.065	0.008
Cesium-137	<LLD	<LLD	<LLD	<LLD	0.0037	0.0037	0.0053	<LLD	0.0033	0.0046	0.0047	0.0048	0.004
San Mateo Kelp Bed													
Potassium-40	*	*	4.2	4.4	7.2	4.7	4.5	6.0	9.1	6.2	6.8	5.2	5.5
Cobalt-60	0.006	<LLD	<LLD	<LLD	<LLD	<LLD	0.015	0.0079	0.0017	<LLD	<LLD	<LLD	<LLD
Zirconium (Niobium)-95	0.062	*	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Iodine-131	0.014	0.017	<LLD	<LLD	0.049	0.020	0.016	0.060	0.033	0.013	0.24	0.056	<LLD
Cesium-137	<LLD	<LLD	<LLD	<LLD	0.0041	0.0035	0.0033	0.0059	0.0032	0.0038	0.0057	0.0043	0.0026
Newport Beach Kelp Bed													
Potassium-40	*	*	2.4	4.7	6.3	4.7	6.9	5.8	5.9	6.6	6.9	5.3	7.3
Cobalt-60	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	0.0016	<LLD	<LLD	<LLD	<LLD
Zirconium (Niobium)-95	0.053	*	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Iodine-131	0.018	0.011	<LLD	<LLD	0.027	0.015	<LLD	<LLD	0.019	<LLD	0.129	0.049	0.049
Cesium-137	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	0.0016	<LLD	0.0044	<LLD	0.0034
Cerium-144	0.016	*	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	0.0034

Abbreviations:
- concentrations listed are in units of pCi/g, wet weight
* - a radionuclide not determined in the analysis
<LLD - less than the lower limit of detection

OCEAN BOTTOM SEDIMENTS

To determine whether or not radioactivity is accumulating in ocean bottom sediments near SONGS, representative samples are collected near each of the SONGS discharge outfalls (which serve as indicator locations), and from Newport Beach (which serves as the control location). After collection, the samples are analyzed for a total of 19 naturally-occurring and SONGS-related radionuclides. Radionuclides detected in ocean bottom sediments over the past six years near SONGS are presented in Table E-6 in terms of "as received" wet sample weights.

Several naturally-occurring radionuclides (i.e., those not associated with SONGS operations) were detected in samples collected from both indicator and control locations. They include potassium-40, radium-226, and thorium-228. Variations in concentrations of the naturally-occurring radionuclides--between both sampling locations, and sampling periods--are considered indicative of this environmental medium.

Radionuclides found in ocean bottom sediments near the SONGS outfalls include manganese-54, cobalt-58, cobalt-60, silver-110m, cesium-137, and cerium-144. The concentrations of manganese-54 in the samples ranged from 0.023 to 0.035, averaging 0.046 pCi/g. Cobalt-58 was also found in three samples. The concentrations of cobalt-58 in the samples ranged from 0.030 to 0.070, averaging 0.049 pCi/g. Cobalt-60 was found in 17 samples. The concentrations of cobalt-60 in the samples ranged from 0.021 to 0.98, averaging 0.27 pCi/g. Silver-110m was found in one sample at a concentration of 0.02 pCi/g. Cesium-137 was found in seven samples. The concentrations of cobalt-60 in the samples ranged from 0.030 to 0.090, averaging 0.049 pCi/g. Cerium-144 was found in one sample at a concentration of 0.060 pCi/g.

The Station-related radionuclides detected in samples collected near the SONGS discharge outfalls were not seen in the ocean bottom sediment samples collected from Newport Beach, with one exception. Cobalt-60 was observed in one sample collected in May 1985 from Newport Beach at a concentration of 0.090 pCi/g.

Station-related radionuclides were detected in samples near SONGS at concentrations above those seen at the control location situated in Newport Beach. However, the concentrations of each of these radionuclides in ocean bottom sediments have been diminishing steadily over the past six years. The reduction in detectable activity is attributable, at least in part, to Edison's commitment to reduce radioactive liquid effluent releases from SONGS.

TABLE E-6

CONCENTRATIONS OF RADIONUCLIDES DETECTED IN OCEAN BOTTOM SEDIMENTS#
1981 - 1986

San Onofre Unit 1 (E)	Jun 81	Dec 81	Jun 82	Nov 82	May 83	Nov 83	May 84	Nov 84	Jun 85	Nov 85	May 86	Nov 86
Potassium-40	*	*	8.93	14	10.3	11.9	9.8	9.2	10.8	10.1	10.6	11.1
Manganese-54	0.035	0.023	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Cobalt-58	0.046	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Cobalt-60	0.83	0.98	0.40	0.10	0.050	0.090	<LLD	0.080	0.090	<LLD	0.060	<LLD
Silver-110m	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Cesium-137	0.040	0.053	0.090	0.050	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Radium-226	0.40	0.46	0.31	0.58	0.60	0.30	0.68	0.17	0.51	0.58	0.56	0.54
Thorium-228	*	*	0.48	0.65	0.87	0.31	0.90	0.21	0.58	0.95	0.64	0.70

San Onofre Unit 1 (W)	Jun 81	Dec 81	Jun 82	Nov 82	May 83	Nov 83	May 84	Nov 84	May 85	Nov 85	May 86	Nov 86
Potassium-40	*	*	19	14	10.2	11.4	8.8	11.3	12.5	6.8	13.8	12.5
Manganese-54	0.08	*	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Cobalt-58	0.030	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Cobalt-60	0.93	0.099	<LLD	0.11	<LLD	0.63	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Silver-110m	0.020	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Cesium-137	0.040	0.041	<LLD	*	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Cerium-144	0.060	*	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Radium-226	0.38	0.54	0.13	0.67	0.66	0.62	0.55	0.45	0.22	0.52	0.24	0.25
Thorium-228	*	*	0.19	0.81	0.84	0.65	0.75	0.55	0.26	0.90	0.28	0.25

Abbreviations:
- concentrations listed are in units of pCi/g, wet weight
* - a radionuclide not determined in the analysis
<LLD - less than the lower limit of detection

TABLE E-6 (Continued)

CONCENTRATIONS OF RADIONUCLIDES DETECTED IN OCEAN BOTTOM SEDIMENTS#
1981 - 1986

San Onofre Unit 2	Jun 81	Dec 81	Jun 82	Oct 82	May 83	Nov 83	May 84	Nov 84	May 85	Nov 85	May 86	Nov 86
Potassium-40	*	*	16	14	11.5	10.2	9.7	11.9	14.1	10.4	15.2	12.4
Manganese-54	*	*	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Cobalt-58	<LLD	<LLD	<LLD	0.07	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Cobalt-60	0.062	0.038	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Silver-110m	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Cesium-137	0.030	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Radium-226	0.52	0.35	0.16	0.33	0.36	0.50	0.28	0.33	0.36	0.44	0.16	0.29
Thorium-228	*	*	0.20	0.34	0.43	0.56	0.30	0.32	0.57	0.49	0.12	0.40

San Onofre Unit 3	Jun 81	Dec 81	Jun 82	Oct 82	May 83	Nov 83	May 84	Nov 84	Jun 85	Nov 85	May 86	Nov 86
Potassium-40	*	*	15	14	10.6	12.5	10.1	16.8	11.2	10.9	15.2	10.6
Manganese-54	*	*	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Cobalt-58	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Cobalt-60	0.040	0.021	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Silver-110m	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Cesium-137	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Radium-226	0.13	0.43	0.25	0.23	0.27	0.45	0.31	0.17	0.40	0.26	0.21	0.50
Thorium-228	*	*	0.26	0.33	0.32	0.59	0.46	0.27	0.50	0.38	0.24	0.57

Abbreviations:
- concentrations listed are in units of pCi/g, wet weight
* - a radionuclide not determined in the analysis
<LLD - less than the lower limit of detection

TABLE E-6 (Continued)

CONCENTRATIONS OF RADIONUCLIDES DETECTED IN OCEAN BOTTOM SEDIMENTS#
1981 - 1986

Newport Beach	Jun 81	Dec 81	Jun 82	Oct 82	May 83	Nov 83	May 84	Nov 84	May 85	Nov 85	May 86	Nov 86
Potassium-40	*	*	13	17	7.1	13.1	11.8	14.8	14.1	10.1	13.2	14.6
Manganese-54	*	*	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Cobalt-58	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Cobalt-60	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	0.090	<LLD	<LLD	<LLD
Silver-110m	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Cesium-137	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Radium-226	0.146	0.090	0.16	0.41	0.080	0.10	0.13	0.50	0.17	0.10	0.22	0.25
Thorium-228	*	*	0.20	0.66	0.090	0.11	0.19	0.79	0.17	0.10	0.42	0.49

Abbreviations:
- concentrations listed are in units of pCi/g, wet weight
* - a radionuclide not determined in the analysis
<LLD - less than the lower limit of detection

APPENDIX F

COMPARISON OF OPERATIONAL WITH PREOPERATIONAL DATA

COMPARISON OF OPERATIONAL WITH PREOPERATIONAL DATA

San Onofre Nuclear Generating Station consists of three pressurized water nuclear reactors housed in separate containment buildings. Unit 1 attained initial criticality in June 1967, and operated until February 1982 when it was shut down for seismic modifications. Unit 1 was brought back into service in December 1984. Units 2 and 3 attained initial criticality in July 1982 and in August 1983, respectively, and have been in operation since then.

The preoperational period (i.e., a span of time prior to attaining initial criticality) for SONGS Unit 1 Radiological Environmental Monitoring Program (REMP) has been defined as the time from 1964 through 1967. The preoperational data for SONGS Units 2 and 3 REMP, on the other hand, has been defined as the period extending from January 1979 to July 1982. The preoperational data for SONGS Units 2 and 3 are the actual operational data obtained from the REMP for SONGS Unit 1.

One method of determining the impact of SONGS operations on the environment during the past year is to compare preoperational data for each of the three units to operational data obtained during 1986. For SONGS Unit 1, this includes a comparison of preoperational to operational data for airborne particulates and local crops. For SONGS Units 2 and 3, this includes a comparison of preoperational to operational data for more types of environmental media, including: airborne particulates, local crops, direct radiation, ocean water, shoreline sediment, ocean bottom sediments, marine species, and kelp.

A. Direct Radiation

SONGS Unit 1:

No direct radiation data were obtained in the preoperational period of 1964 to 1967. Therefore, no comparison is possible.

SONGS Units 2 and 3:

Direct radiation measurements are made both quarterly and annually at a number of indicator locations, and at a control location situated in Huntington Beach. Calcium sulfate ($CaSO_4$:Dy) thermoluminescent dosimeters are used to measure quarterly radiation doses, and lithium fluoride (LiF) dosimeters are used to measure annual radiation doses. In order to evaluate the variation in external radiation exposure, plots were made of direct radiation exposure (in mrem) for six different locations versus for the preoperational and operational periods (through 1986) for Units 2 and 3. See Figures 20, 21, and 22.

The quarterly direct radiation levels measured during the preoperational period for the indicator locations ranged from 14.2 to 87.9 mrem, averaging 25.2 mrem. Quarterly direct radiation levels measured during the preoperational period for Huntington Beach ranged from 25.1 to 44.1 mrem, averaging 32.1 mrem.

Annual direct radiation levels measured during the preoperational period for the indicator locations ranged from 56.0 to 108.0 mrem, averaging 76.3 mrem. Annual direct radiation levels measured during the preoperational period for Huntington Beach ranged from 84.0 to 112.0 mrem, averaging 96.0 mrem.

The quarterly direct radiation levels measured during 1986 for the indicator locations ranged from 9.2 to 35.4 mrem, averaging 19.0 mrem. Quarterly direct radiation levels measured during 1986 for Huntington Beach ranged from 21.2 to 22.7 mrem, averaging 21.9 mrem.

Annual direct radiation levels measured during 1986 for the indicator locations ranged from 41.1 to 123.3 mrem, averaging 86.9 mrem. The annual direct radiation level measured during 1986 for Huntington Beach was 97.3 mrem.

The range of quarterly direct radiation doses was larger at both indicator and control locations during the preoperational period than during the 1986 operational period for SONGS Units 2 and 3. The range of annual direct radiation doses measured at the indicator locations in 1986 was larger than during the preoperational period. The direct radiation doses measured at the control location during both periods of time, however, were comparable.

The larger range of quarterly radiation levels seen during the preoperational time span may be attributable to atmospheric nuclear weapons tests that occurred in March 1978 and October 15, 1980, as well as the eruption of the Mount St. Helens volcano in May 1980. The noticeable decline in direct radiation levels since 1979 is likely due to a curtailment of the atmospheric nuclear weapons testing. The larger range of annual direct radiation levels seen in 1986 may be attributable to the Chernobyl nuclear power plant accident that occurred in Spring 1986, in addition to the continued fallout from weapons testing. Other factors, such as meteorology, geographic locations, and statistical and seasonal fluctuations may also describe the variation in the direct radiation levels.

Because of nuclear fallout, it is difficult to accurately assess the impact of SONGS operations during 1986 on this environmental medium.

B. Air Particulates

SONGS Unit 1:

Samples of air particulates are collected frequently from indicator locations, and a control location situated in Oceanside. After collection, the samples were subsequently analyzed for gross beta activity.

During the preoperational period (1964 to 1967), gross beta activities measured at the indicator locations ranged from 0.030 to 3.81 pCi/m3, averaging 0.253 pCi/m3. The gross beta activities measured at the control location, on the other hand, ranged from 0.04 to 2.77 pCi/m3, averaging 0.31 pCi/m3.

During 1986, gross beta activities measured at the indicator locations ranged from 0.003 to 0.89 pCi/m3, averaging 0.045 pCi/m3. Gross beta activities measured at the control location, however, ranged from 0.010 to 0.72 pCi/m3, averaging 0.0457 pCi/m3.

The gross beta levels seen during both the preoperational and operational periods are higher than anticipated for this environmental medium. Significant contributions to gross beta levels in air outside of Station operations is substantiated by the fact that gross beta levels were commensurate at both the indicator and control locations during the preoperational period, and again during 1986. The higher preoperational gross beta levels in air can be attributed to fallout from nuclear weapons testing. The higher 1986 gross beta levels in air may be attributed to fallout from the Chernobyl accident, as well as previous nuclear weapons testing.

Because the actual environmental levels were masked from the fallout, valid comparisons of preoperational data to 1986 operational data could not be made.

SONGS Units 2 and 3:

Samples of air particulates are collected frequently from indicator and control locations surrounding SONGS, and are subsequently analyzed for gross beta activity.

From 1979 through July 1982 (which is considered to be the preoperational period for SONGS Units 2 and 3), there is an 18 month period of noticeably higher gross beta activities in air. See Figures 23 and 24. This period extends from the fourth quarter of 1980 through the second quarter of 1981. These higher activities may be attributable to the atmospheric nuclear weapons tests that occurred in March 1978, and October 15, 1980, as well as the eruption of the Mount St. Helens volcano in May 1980. Because these higher levels mask the normal environmental gross beta levels near SONGS, the data collected during this time frame have been excluded from the preoperational baseline data set.

During the preoperational period, gross beta activities measured at the indicator locations ranged from 0.004 to 0.101 pCi/m3, averaging 0.027 pCi/m3. The gross beta activities measured at the control location, on the other hand, ranged from 0.005 to 0.104 pCi/m3, averaging 0.028 pCi/m3.

During the operational period, gross beta activities measured at the indicator locations ranged from 0.003 to 0.89 pCi/m3, averaging 0.045 pCi/m3. Gross beta activities measured at the control location, however, ranged from 0.010 to 0.72 pCi/m3, averaging 0.046 pCi/m3.

In reviewing the data, the gross beta activities measured during the 1986 operational period are higher than those measured during the preoperational period for SONGS Units 2 and 3. The higher activities seen in 1986, though, can be attributed to fallout from the Chernobyl nuclear power plant accident.

C. Crops

SONGS Unit 1:

During the preoperational phase of Unit 1, local crops were collected semiannually from both indicator and control locations, and were subsequently analyzed for both aqueous and organically-bound tritium, and for strontium-90. These analyses were then continued into the operational phase of the radiological environmental monitoring program, and were extended to include gamma spectral analysis of the crops. The results of these analyses are summarized below in terms of "as received" wet sample weights.

In short, from 1964 to 1967, no aqueous or organically-bound tritium were detected in samples collected from the indicator and control locations. Strontium-90, however, was present in detectable amounts in four of the six samples collected from the indicator locations near SONGS. The concentrations of strontium-90 in these samples ranged from 0.008 to 0.030 pCi/g, averaging 0.022 pCi/g. Strontium-90 was not detected in any of the samples collected from the control location.

During 1986, no strontium-90, aqueous tritium, or bound tritium was found in any of the samples collected from the indicator locations. Potassium-40, a naturally-occurring radionuclide, was the only gamma-emitting radionuclide detected in the crops from the indicator locations. Potassium-40 was seen in each of the samples. The concentrations of potassium-40 in these samples ranged from 1.08 to 15.4 pCi/g, averaging 5.2 pCi/g.

In 1986, no aqueous tritium or bound tritium was found in any of the samples collected from the control location. Potassium-40 and cesium-137 were the only gamma-emitting radionuclides detected in the crops from the control location. Potassium-40 was seen in each of the samples. The concentrations of potassium-40 in these samples ranged from 1.17 to 2.8 pCi/g, averaging 0.65 pCi/g. Cesium-137 was seen in two of the samples collected from the control location. The concentrations of cesium-137 in these samples were 0.0037 and 0.010 pCi/g. Strontium-90 was also detected in two of the four samples collected from the control location. The concentrations of strontium-90 in these samples were 0.010 and 0.011 pCi/g.

The levels of aqueous tritium, bound tritium, and strontium-90 seen in crops from 1964 to 1967 are commensurate to the levels seen during 1986. The presence of strontium-90 in the samples may be attributable to atmospheric nuclear weapons tests. Potassium-40 and cesium-137 concentrations were not measured in samples collected during the preoperational years for Unit 1, making a comparison with 1986 operational data impossible. However, it can be said that the potassium-40 concentrations measured in the samples during 1986 are not related to Station operations and are considered indicative of this environmental medium. The presence of cesium-137 in the samples collected in 1986 from the control location may be due to the Chernobyl nuclear power plant accident that occurred in May 1986, in addition to fallout from atmospheric weapons tests.

SONGS Units 2 and 3:

During the preoperational and operational phases for Units 2 and 3, local crops were collected semiannually from both indicator and control locations. The samples were subsequently analyzed for a number of gamma-emitting radionuclides, aqueous tritium, organically-bound tritium, and for strontium-90. These analyses were then continued into the operational phase of the radiological environmental monitoring program. The results of these analyses are summarized below in terms of "as received" wet sample weights.

From January 1979 to July 1982, no aqueous tritium or strontium-90 was found in crops collected from the indicator locations. Potassium-40 was the only gamma-emitting radionuclide detected in samples collected from the indicator locations. Bound tritium was detected in six crop samples collected from the indicator locations. The concentrations of bound tritium in these samples ranged from 16 to 300 pCi/g, averaging 147 pCi/g.

During this same time span, no aqueous tritium was found in crops collected from the control location. Several other radionuclides, though, were seen in some of the crops collected from the control location. Potassium-40 was detected in each sample. In June 1981, zirconium (niobium)-95 and cerium-144 were found in a sample of parsley from the control location. The concentrations of these radionuclides in the parsley were 0.090 and 0.12 pCi/g, respectively. Bound tritium was also detected in four samples. The concentrations of bound tritium in these samples ranged from 17 to 110 pCi/g, averaging 62 pCi/g. Strontium-90 was also present in detectable amounts in three samples. The concentrations of strontium-90 in the samples ranged from 0.027 to 0.090 pCi/g, averaging 0.056 pCi/g.

In 1986, no strontium-90, aqueous tritium or bound tritium was found in any of the samples collected from the indicator locations. Potassium-40, a naturally-occurring radionuclide, was the only gamma-emitting radionuclide detected in the crops from the indicator locations. Potassium-40 was seen in each of the samples. The concentrations of potassium-40 in these samples ranged from 1.08 to 15.4 pCi/g, averaging 5.2 pCi/g.

In 1986, no aqueous tritium or bound tritium was found in any of the samples collected from the control location. Potassium-40 and cesium-137 were the only gamma-emitting radionuclides detected in the crops from the control location. Potassium-40 was seen in each of the samples. The concentrations of potassium-40 in these samples ranged from 1.17 to 2.8 pCi/g, averaging 0.65 pCi/g. Cesium-137 was seen in two of the samples collected from the control location. The concentrations of cesium-137 in these samples were 0.0037 and 0.010 pCi/g. Strontium-90 was also detected in two of the four samples collected from the control location. The concentrations of strontium-90 in these samples were 0.010 and 0.011 pCi/g.

Radionuclide concentrations seen in crops collected in 1986 are, for the most part, commensurate to or less than those levels seen during the preoperational period for Units 2 and 3. The potassium-40 concentrations measured in the samples are not related to Station operations and are considered indicative of this environmental medium. The presence of strontium-90, cerium-144, and zirconium (niobium)-95 in crops collected from the control location may be attributable to atmospheric nuclear weapons tests. The presence of cesium-137 in the samples collected in 1986 from the control location may be due to the Chernobyl nuclear power plant accident that occurred in May 1986, and fallout from previous nuclear atmospheric weapons tests.

D. Ocean Water

SONGS Unit 1:

Ocean water samples were not collected and analyzed during the preoperational period for SONGS Unit 1. Therefore, no comparison with operational data is possible.

SONGS Units 2 and 3:

Ocean water samples are collected on a monthly basis in the vicinity of each of the Station discharge outfalls (which serve as indicator locations), and from Newport Beach (which serves as a control location). Upon collection, each of the samples are analyzed for 19 naturally-occurring and Station-related gamma-emitting radionuclides. Every other month, the samples are also analyzed for gross beta activity. Finally, samples are composited quarterly and are analyzed for tritium.

During the preoperational period, potassium-40 was the only gamma-emitting radionuclide detected in each of the samples collected from both indicator and control locations. Other gamma-emitting radionuclides were seen in only one ocean water sample. In May 1980, cobalt-58, cobalt-60, cesium-134 , and cesium-137 were found in an ocean water sample collected from the SONGS Unit 1 outfall. Concentrations of the radionuclides in this sample were 11, 6, 380, and 430 pCi/l, in that order.

Gross beta activities were detectable in each of the bimonthly samples during this time span. Gross beta activities in the samples collected from the indicator locations ranged from 660 to 1350 pCi/l, averaging 917 pCi/l. Gross beta activities measured at the control location, on the other hand, ranged from 640 to 1250 pCi/l, averaging 924 pCi/l.

Tritium was also seen in two of the ocean water samples collected in 1980 from the SONGS Unit 2 outfall and from Newport Beach. The tritium activities measured in ocean water were 1900 and 400 pCi/l, respectively.

Throughout 1986, potassium-40 was the only gamma-emitting radionuclide detected in the monthly gamma spectral analyses of samples collected from the indicator and control locations. Potassium-40 was detected in each sample.

Gross beta activity was detected in each bimonthly ocean water sample in 1986. The gross beta activity in the samples collected from the indicator locations ranged from 500 to 1200 pCi/l, averaging 822 pCi/l. The gross beta activity in the samples collected from the control location ranged from 700 to 1000 pCi/l, averaging 850 pCi/l.

Tritium was detected in the 1986 third quarter composite sample obtained from SONGS Unit 1. The concentration of tritium in this sample was 2200 pCi/l. Radionuclide concentrations seen in ocean water in 1986 are, for the most part, commensurate to or less than the levels seen during the preoperational period for Units 2 and 3.

E. Ocean Bottom Sediments

SONGS Unit 1:

Ocean bottom sediment samples were not collected and analyzed during the preoperational period for SONGS Unit 1. Therefore, no comparison with operational data is possible.

SONGS Units 2 and 3:

To determine the amount of radioactivity in ocean bottom sediments in the vicinity of SONGS, representative samples are collected semiannually near each of the Station discharge outfalls (which served as indicator locations), and from Newport Beach (which served as the control location). After collection, the samples are analyzed for 19 naturally-occurring and Station-related radionuclides.

During the preoperational period, three naturally-occurring radionuclides were found in each sample collected from the indicator locations. They include potassium-40, radium-226, and thorium-232.

Station-related radionuclides were also found in samples collected during this time frame. Manganese-54 was found in two samples. The concentrations of manganese-54 in these samples ranged from 0.080 to 0.49 pCi/g, averaging 0.29 pCi/g. Cobalt-58 was detected in four samples. The concentrations of cobalt-58 in the samples ranged from 0.046 to 1.16 pCi/g, averaging 0.42 pCi/g. Cobalt-60 was seen in ten samples. The concentrations of cobalt-60 in the samples ranged from 0.040 to 8.1 pCi/g, averaging 1.2 pCi/g. Cesium-137 was seen in ten samples. The concentrations of cesium-137 in the samples ranged from 0.040 to 0.090 pCi/g, averaging 0.050 pCi/g. Cerium-144 was found in one sample. The concentration of cerium-144 in the sample was 0.26 pCi/g.

In 1986, potassium-40, radium-226, and thorium-232 were found in each sediment sample. Cobalt-60 was found in one sample collected by the SONGS Unit 1 outfall in May 1986. The concentration of cobalt-60 in this sample was 0.06 pCi/g, wet weight.

The concentrations of Station-related radionuclides seen in ocean bottom sediment samples during 1986 are markedly lower than the levels seen in ocean bottom sediments during the preoperational years for Units 2 and 3. The results indicate that there has not been a build-up of

radionuclides with time in ocean bottom sediments near SONGS. The notable decrease in radionuclide concentrations found in ocean bottom sediments is due, at least in part, to Southern California Edison's commitment to reduce radioactive liquid discharges from San Onofre.

F. Marine Species (Flesh)

SONGS Unit 1:

Marine species were not collected and analyzed during the preoperational period for SONGS Unit 1. Therefore, no comparison with operational data is possible.

SONGS Units 2 and 3:

Non-migratory marine species are collected on a quarterly basis near SONGS to determine the amount of radioactivity that could be consumed by man or in the food chain to man. Marine species caught by the SONGS outfalls and from Newport Beach include two species of adult fish, crustacea and mollusks. Upon collection, the flesh portion is analyzed for three naturally-occurring radionuclides, for 16 gamma-emitting, Station-related radionuclides, and for aqueous and bound tritium. The results are subsequently reported to Edison in terms of both dry and wet sample weights.

Selected results for six different marine species for both the preoperational and 1986 operational periods for Units 2 and 3 are presented in Table F-1. The marine species used for purposes of comparison include: sheephead (a fish), black perch (a fish), bay mussel (a mollusk), spiny lobster (a crustacea), sea hare (a mollusk), and keyhole limpet (a mollusk). Radionuclides not included in Table F-1 were below the lower limits of detection for both the preoperational and operational time spans.

In comparing preoperational and operational data for each marine species and radionuclide, it is evident that potassium-40 (a non-Station-related radionuclide) is appearing more frequently at the same concentrations in marine species in 1986 than during the preoperational period. It is also clear--with few exceptions--that the concentrations of Station-related radionuclides detected in each species during 1986 are commensurate to or less than the concentrations seen in the same marine species during the preoperational period.

From these data, it can be concluded that the operation of SONGS Units 1, 2, and 3 in 1986 had less of an impact on the environment than the operation of SONGS Unit 1 during the preoperational period for SONGS Units 2 and 3. The reduction in the radionuclide concentrations can be attributed, at least in part, to Edison's commitment to decrease radioactive effluent releases.

G. Shoreline Sediment (Sand)

SONGS Unit 1:

Samples of shoreline sediment were not collected and analyzed during the preoperational period for SONGS Unit 1. Therefore, no comparison with operational data is possible.

SONGS Units 2 and 3:

Beach sand is collected semiannually from three indicator locations and from a control location situated in Newport Beach. After collection, the samples are analyzed for 19 naturally-occurring and SONGS-related radionuclides.

To assess the impact of SONGS operations on this environmental medium, preoperational data were compared to 1986 operational data. See Table F-2. No SONGS-related radionuclides were detected in shoreline sediment in either time frame. However, three naturally-occurring (i.e., non-Station-related) radionuclides were detected in shoreline sediment. They include: potassium-40, radium-226, and thorium-228. Although each of the radionuclides appears more frequently in the samples collected in 1986, the concentrations of the radionuclides are considered comparable to the preoperational period.

Because no Station-related radionuclides were detected in shoreline sediment during the preoperational and 1986 operational periods for SONGS Units 2 and 3, the impact of SONGS on this environmental medium is considered to be negligible.

H. Kelp

SONGS Unit 1:

Samples of kelp were not collected and analyzed during the preoperational period for SONGS Unit 1. Therefore, no comparison with operational data is possible.

SONGS Units 2 and 3:

Kelp is collected semiannually from two indicator locations and from a control location situated in Laguna Beach. After collection, the samples are analyzed by gamma-spectral analysis for 19 naturally-occurring and SONGS-related radionuclides. The samples are also analyzed for both aqueous and bound tritium.

To assess the impact of SONGS operations on kelp, preoperational data were compared to 1986 operational data. See Table F-3. Radionuclides detected during the preoperational period for SONGS Units 2 and 3 include potassium-40, bound tritium, manganese-54, cobalt-60, zirconium (niobium)-95, iodine-131, and cesium-137. Of these, only potassium-40, iodine-131, and cesium-137 are present in detectable amounts in kelp samples collected in 1986. Potassium-40 is seen more frequently, at

slightly higher concentrations in kelp samples collected in 1986. The range of iodine-131 concentrations is higher and is more frequent. Cesium-137 concentrations are seen more frequently in the same concentration range.

These data indicate that the impact of SONGS operations on this environmental medium has decreased in 1986 in comparison to the preoperational period. The exception to this is the more frequent and higher (yet still minute) concentrations of iodine-131 seen in kelp in 1986. Although the concentrations of iodine-131 have increased, there is no evidence that iodine-131 is steadily increasing in concentration in kelp near SONGS.

TABLE F-1

MARINE SPECIES (FLESH)
PREOPERATIONAL AND OPERATIONAL DATA #
SONGS UNITS 2 AND 3

SHEEPHEAD:

Radionuclide	Period*	Indicator* Freq. of Detection	Indicator* Range	Indicator* Average	Control* Freq. of Detection	Control* Range	Control* Average
H-3 Aqueous	Preop	0/28	<LLD	<LLD	1/14	0.110-0.110	0.110
H-3 Aqueous	Op	0/8	<LLD	<LLD	0/4	<LLD	<LLD
H-3 Bound	Preop	15/28	3.6-88.0	25.1	8/14	4.0-94.0	20.9
H-3 Bound	Op	0/8	<LLD	<LLD	0/4	<LLD	<LLD
K-40	Preop	2/28	3.1-3.4	3.25	1/14	2.8-2.8	2.8
K-40	Op	8/8	2.1-3.2	2.76	4/4	2.3-3.0	2.6
Mn-54	Preop	0/28	<LLD	<LLD	0/14	<LLD	<LLD
Mn-54	Op	0/8	<LLD	<LLD	0/4	<LLD	<LLD
Co-57	Preop	0/28	<LLD	<LLD	0/14	<LLD	<LLD
Co-57	Op	0/8	<LLD	<LLD	0/4	<LLD	<LLD
Co-58	Preop	2/28	0.016-0.030	0.023	0/14	<LLD	<LLD
Co-58	Op	2/8	.015-.015	.015	0/4	<LLD	<LLD
Fe-59	Preop	0/28	<LLD	<LLD	0/14	<LLD	<LLD
Fe-59	Op	0/8	<LLD	<LLD	0/4	<LLD	<LLD
Co-60	Preop	3/28	0.007-0.044	.0207	0/14	<LLD	<LLD
Co-60	Op	2/8	0.027-0.046	.037	0/4	<LLD	<LLD
Ag-110m	Preop	0/28	<LLD	<LLD	0/14	<LLD	<LLD
Ag-110m	Op	0/8	<LLD	<LLD	0/4	<LLD	<LLD
Cs-134	Preop	0/28	<LLD	<LLD	0/14	<LLD	<LLD
Cs-134	Op	0/8	<LLD	<LLD	0/4	<LLD	<LLD
Cs-137	Preop	28/28	0.004-0.018	0.0103	13/14	0.005-0.012	0.0075
Cs-137	Op	8/8	0.005-0.035	0.0123	4/4	0.004-0.005	0.0046

Preoperational data - from January 1979-July 1982
Operational data - from January-December 1986
* Concentrations listed are in units of pCi/g, wet weight

TABLE F-1

MARINE SPECIES (FLESH)
PREOPERATIONAL AND OPERATIONAL DATA #
SONGS UNITS 2 AND 3
(Continued)

BLACK PERCH:

Radionuclide	Period*	Indicator* Freq. of Detection	Indicator* Range	Indicator* Average	Control* Freq. of Detection	Control* Range	Control* Average
H-3 Aqueous	Preop	1/28	0.35-0.35	0.35	0/14	<LLD	<LLD
H-3 Aqueous	Op	0/8	<LLD	<LLD	0/4	<LLD	<LLD
H-3 Bound	Preop	20/28	3.2-109	27.7	6/14	4.5-150	42.3
H-3 Bound	Op	0/8	<LLD	<LLD	0/4	<LLD	<LLD
K-40	Preop	2/28	2.5-2.8	2.65	1/14	2.5-2.5	2.5
K-40	Op	8/8	1.8-2.8	2.41	4/4	2.0-2.5	2.3
Mn-54	Preop	0/28	<LLD	<LLD	0/14	<LLD	<LLD
Mn-54	Op	0/8	<LLD	<LLD	0/4	<LLD	<LLD
Co-57	Preop	0/28	<LLD	<LLD	0/14	<LLD	<LLD
Co-57	Op	0/8	<LLD	<LLD	0/4	<LLD	<LLD
Co-58	Preop	1/28	0.011-0.011	0.011	0/14	<LLD	<LLD
Co-58	Op	0/8	<LLD	<LLD	0/4	<LLD	<LLD
Fe-59	Preop	0/28	<LLD	<LLD	0/14	<LLD	<LLD
Fe-59	Op	0/8	<LLD	<LLD	0/4	<LLD	<LLD
Co-60	Preop	3/28	0.012-0.045	0.030	0/14	<LLD	<LLD
Co-60	Op	2/8	0.008-0.012	0.010	0/4	<LLD	<LLD
Ag-110m	Preop	0/28	<LLD	<LLD	0/14	<LLD	<LLD
Ag-110m	Op	0/8	<LLD	<LLD	0/4	<LLD	<LLD
Cs-134	Preop	0/28	<LLD	<LLD	0/14	<LLD	<LLD
Cs-134	Op	0/8	<LLD	<LLD	0/4	<LLD	<LLD
Cs-137	Preop	26/28	.003-.015	.0087	13/14	.004-.014	.0087
Cs-137	Op	7/8	0.005-0.009	0.0064	3/4	0.004-0.007	0.0055

Preoperational data - from January 1979-July 1982
Operational data - from January-December 1986
* Concentrations listed are in units of pCi/g, wet weight

TABLE F-1

MARINE SPECIES (FLESH)
PREOPERATIONAL AND OPERATIONAL DATA #
SONGS UNITS 2 AND 3
(Continued)

BAY MUSSEL:

Radionuclide	Period*	Indicator* Freq. of Detection	Indicator* Range	Indicator* Average	Control* Freq. of Detection	Control* Range	Control* Average
H-3 Aqueous	Preop	0/10	<LLD	<LLD	0/0	N/A	N/A
H-3 Aqueous	Op	0/4	<LLD	<LLD	0/0	N/A	N/A
H-3 Bound	Preop	1/10	53-53	53	0/0	N/A	N/A
H-3 Bound	Op	0/4	<LLD	<LLD	0/0	N/A	N/A
K-40	Preop	1/10	1.400-1.400	1.400	0/0	N/A	N/A
K-40	Op	4/4	0.67-0.75	0.72	0/0	N/A	N/A
Mn-54	Preop	1/10	0.025-0.025	0.025	0/0	N/A	N/A
Mn-54	Op	0/4	<LLD	<LLD	0/0	N/A	N/A
Co-57	Preop	0/10	<LLD	<LLD	0/0	N/A	N/A
Co-57	Op	0/4	<LLD	<LLD	0/0	N/A	N/A
Co-58	Preop	5/10	0.011-0.080	0.031	0/0	N/A	N/A
Co-58	Op	1/4	0.010-0.010	0.010	0/0	N/A	N/A
Fe-59	Preop	0/10	<LLD	<LLD	0/0	N/A	N/A
Fe-59	Op	0/4	<LLD	<LLD	0/0	N/A	N/A
Co-60	Preop	9/10	0.010-0.400	0.085	0/0	N/A	N/A
Co-60	Op	4/4	0.007-0.019	0.012	0/0	N/A	N/A
Ag-110m	Preop	0/10	<LLD	<LLD	0/0	N/A	N/A
Ag-110m	Op	0/4	<LLD	<LLD	0/0	N/A	N/A
Cs-134	Preop	0/10	<LLD	<LLD	0/0	N/A	N/A
Cs-134	Op	0/4	<LLD	<LLD	0/0	N/A	N/A
Cs-137	Preop	2/10	0.003-0.006	0.0045	0/0	N/A	N/A
Cs-137	Op	0/4	<LLD	<LLD	0/0	N/A	N/A
Ru-103	Preop	1/10	0.045-0.045	0.045	0/0	N/A	N/A
Ru-103	Op	0/4	<LLD	<LLD	0/0	N/A	N/A

Preoperational data - from January 1979-July 1982
Operational data - from January-December 1986
* Concentrations listed are in units of pCi/g, wet weight

TABLE F-1

MARINE SPECIES (FLESH)
PREOPERATIONAL AND OPERATIONAL DATA #
SONGS UNITS 2 AND 3
(Continued)

SPINY LOBSTER:

Radionuclide	Period*	Indicator* Freq. of Detection	Indicator* Range	Indicator* Average	Control* Freq. of Detection	Control* Range	Control* Average
H-3 Aqueous	Preop	0/24	<LLD	<LLD	0/14	<LLD	<LLD
H-3 Aqueous	Op	0/8	<LLD	<LLD	0/4	<LLD	<LLD
H-3 Bound	Preop	11/24	3.0-46.0	21.4	7/14	3.00-51.0	18.7
H-3 Bound	Op	0/8	<LLD	<LLD	0/4	<LLD	<LLD
K-40	Preop	2/24	2.600-3.100	2.850	1/14	2.8-2.8	2.8
K-40	Op	8/8	1.9-3.3	2.6	4/4	2.5-3.2	2.9
Mn-54	Preop	0/24	<LLD	<LLD	1/14	<LLD	<LLD
Mn-54	Op	0/8	<LLD	<LLD	0/4	<LLD	<LLD
Co-57	Preop	0/24	<LLD	<LLD	0/14	<LLD	<LLD
Co-57	Op	0/8	<LLD	<LLD	0/4	<LLD	<LLD
Co-58	Preop	8/24	0.013-0.270	0.095	0/14	<LLD	<LLD
Co-58	Op	0/8	<LLD	<LLD	0/4	<LLD	<LLD
Fe-59	Preop	0/24	<LLD	<LLD	0/14	<LLD	<LLD
Fe-59	Op	0/8	<LLD	<LLD	0/4	<LLD	<LLD
Co-60	Preop	17/24	0.014-0.210	0.061	0/14	<LLD	<LLD
Co-60	Op	5/8	0.008-0.017	0.012	0/4	<LLD	<LLD
Ag-110m	Preop	19/24	0.092-0.360	0.192	0/14	<LLD	<LLD
Ag-110m	Op	0/8	<LLD	<LLD	0/4	<LLD	<LLD
Cs-134	Preop	0/24	<LLD	<LLD	0/14	<LLD	<LLD
Cs-134	Op	0/8	<LLD	<LLD	0/4	<LLD	<LLD
Cs-137	Preop	4/24	0.005-0.011	.0075	6/14	0.004-0.015	.0075
Cs-137	Op	8/8	0.004-0.012	0.0053	3/4	0.003-0.004	0.0036

Preoperational data - from January 1979-July 1982
Operational data - from January-December 1986
* Concentrations listed are in units of pCi/g, wet weight

TABLE F-1

MARINE SPECIES (FLESH)
PREOPERATIONAL AND OPERATIONAL DATA #
SONGS UNITS 2 AND 3
(Continued)

SEA HARE:

Radionuclide	Period*	Freq. of Detection	Indicator* Range	Indicator* Average	Freq. of Detection	Control* Range	Control* Average
H-3 Aqueous	Preop	0/14	<LLD	<LLD	0/9	<LLD	<LLD
H-3 Aqueous	Op	0/4	<LLD	<LLD	0/0	N/A	N/A
H-3 Bound	Preop	3/14	6.2-11.9	9.03	1/9	6.2-6.2	6.2
H-3 Bound	Op	0/4	<LLD	<LLD	0/0	N/A	N/A
K-40	Preop	1/14	1.2-1.2	1.2	0/9	<LLD	<LLD
K-40	Op	4/4	0.84-1.2	0.99	0/0	N/A	N/A
Mn-54	Preop	0/14	<LLD	<LLD	0/9	<LLD	<LLD
Mn-54	Op	0/4	<LLD	<LLD	0/0	N/A	N/A
Co-57	Preop	1/14	0.017-0.017	0.017	0/9	<LLD	<LLD
Co-57	Op	0/4	<LLD	<LLD	0/0	N/A	N/A
Co-58	Preop	12/14	0.031-12.4	1.34	0/9	<LLD	<LLD
Co-58	Op	2/4	0.018-0.026	0.022	0/0	N/A	N/A
Fe-59	Preop	0/14	<LLD	<LLD	0/9	<LLD	<LLD
Fe-59	Op	0/4	<LLD	<LLD	0/0	N/A	N/A
Co-60	Preop	14/14	0.016-2.000	0.441	3/9	0.012-0.027	0.018
Co-60	Op	4/4	0.014-0.136	0.069	0/0	N/A	N/A
Zn-65	Preop	1/14	0.100-0.100	0.100	0/9	<LLD	<LLD
Zn-65	Op	0/4	<LLD	<LLD	0/0	N/A	N/A
Ag-110m	Preop	8/14	0.100-0.500	0.203	0/9	<LLD	<LLD
Ag-110m	Op	0/4	<LLD	<LLD	0/0	N/A	N/A
Cs-134	Preop	0/14	<LLD	<LLD	0/9	<LLD	<LLD
Cs-134	Op	0/4	<LLD	<LLD	0/0	N/A	N/A
Cs-137	Preop	1/14	0.004-0.004	0.004	1/9	0.005-0.005	0.005
Cs-137	Op	0/4	<LLD	<LLD	0/0	N/A	N/A
Ra-226	Preop	0/14	<LLD	<LLD	0/9	<LLD	<LLD
Ra-226	Op	1/4	0.040-0.040	0.040	0/0	N/A	N/A
Th-228	Preop	0/14	<LLD	<LLD	0/9	<LLD	<LLD
Th-228	Op	2/4	0.038-0.050	0.044	0/0	N/A	N/A

Preoperational data - from January 1979-July 1982
Operational data - from January-December 1986
* Concentrations listed are in units of pCi/g, wet weight

TABLE F-1

MARINE SPECIES (FLESH)
PREOPERATIONAL AND OPERATIONAL DATA #
SONGS UNITS 2 AND 3
(Continued)

KEYHOLE LIMPET:

Radionuclide	Period*	Indicator* Freq. of Detection	Indicator* Range	Indicator* Average	Control* Freq. of Detection	Control* Range	Control* Average
H-3 Aqueous	Preop	0/4	<LLD	<LLD	0/5	<LLD	<LLD
H-3 Aqueous	Op	0/0	N/A	N/A	0/4	<LLD	<LLD
H-3 Bound	Preop	0/4	<LLD	<LLD	1/5	35.0-35.0	35.0
H-3 Bound	Op	0/0	N/A	N/A	0/4	<LLD	<LLD
K-40	Preop	0/4	<LLD	<LLD	1/5	1.1-1.1	1.1
K-40	Op	0/0	N/A	N/A	4/4	0.68-1.02	0.89
Mn-54	Preop	0/4	<LLD	<LLD	0/5	<LLD	<LLD
Mn-54	Op	0/0	N/A	N/A	0/4	<LLD	<LLD
Co-57	Preop	0/4	<LLD	<LLD	0/5	<LLD	<LLD
Co-57	Op	0/0	N/A	N/A	0/4	<LLD	<LLD
Co-58	Preop	2/4	0.054-0.101	0.078	1/5	0.190-0.190	0.190
Co-58	Op	0/0	N/A	N/A	0/4	<LLD	<LLD
Fe-59	Preop	0/4	<LLD	<LLD	0/5	<LLD	<LLD
Fe-59	Op	0/0	N/A	N/A	0/4	<LLD	<LLD
Co-60	Preop	3/4	0.021-0.040	.0327	1/5	0.022-0.022	0.022
Co-60	Op	0/0	N/A	N/A	0/4	<LLD	<LLD
Ag-110m	Preop	1/4	0.101-0.101	0.101	0/5	<LLD	<LLD
Ag-110m	Op	0/0	N/A	N/A	0/4	<LLD	<LLD
Cs-134	Preop	0/4	<LLD	<LLD	0/5	<LLD	<LLD
Cs-134	Op	0/0	N/A	N/A	0/4	<LLD	<LLD
Cs-137	Preop	0/4	<LLD	<LLD	1/5	0.005-0.005	0.005
Cs-137	Op	0/0	N/A	N/A	0/4	<LLD	<LLD

Preoperational data - from January 1979-July 1982
Operational data - from January-December 1986
* Concentrations listed are in units of pCi/g, wet weight

TABLE F-2

SHORELINE SEDIMENT (SAND)
PREOPERATIONAL AND OPERATIONAL DATA #
SONGS UNITS 2 AND 3

Radionuclide	Period*	Freq. of Detection	Indicator* Range	Indicator* Average	Freq. of Detection	Control* Range	Control* Average
K-40	Preop	3/21	15.0-18.0	16.7	1/7	20.0-20.0	20.0
K-40	Op	6/6	12.9-16.6	14.2	2/2	17.5-17.8	17.7
Mn-54	Preop	0/21	<LLD	<LLD	0/7	<LLD	<LLD
Mn-54	Op	0/6	<LLD	<LLD	0/2	<LLD	<LLD
Co-57	Preop	0/21	<LLD	<LLD	0/7	<LLD	<LLD
Co-57	Op	0/6	<LLD	<LLD	0/2	<LLD	<LLD
Co-58	Preop	0/21	<LLD	<LLD	0/7	<LLD	<LLD
Co-58	Op	0/6	<LLD	<LLD	0/2	<LLD	<LLD
Fe-59	Preop	0/21	<LLD	<LLD	0/7	<LLD	<LLD
Fe-59	Op	0/6	<LLD	<LLD	0/2	<LLD	<LLD
Co-60	Preop	0/21	<LLD	<LLD	0/7	<LLD	<LLD
Co-60	Op	0/6	<LLD	<LLD	0/2	<LLD	<LLD
Ag-110m	Preop	0/21	<LLD	<LLD	0/7	<LLD	<LLD
Ag-110m	Op	0/6	<LLD	<LLD	0/2	<LLD	<LLD
Cs-134	Preop	0/21	<LLD	<LLD	0/7	<LLD	<LLD
Cs-134	Op	0/6	<LLD	<LLD	0/2	<LLD	<LLD
Cs-137	Preop	0/21	<LLD	<LLD	0/7	<LLD	<LLD
Cs-137	Op	0/6	<LLD	<LLD	0/2	<LLD	<LLD
Ce-144	Preop	0/21	<LLD	<LLD	0/7	<LLD	<LLD
Ce-144	Op	0/6	<LLD	<LLD	0/2	<LLD	<LLD
Ra-226	Preop	21/21	0.14-0.88	0.35	7/7	0.24-0.55	0.37
Ra-226	Op	6/6	0.12-0.37	0.19	2/2	0.24-0.37	0.31
Th-228	Preop	3/21	0.12-0.87	0.39	1/7	1.53-1.53	1.53
Th-228	Op	6/6	0.12-0.39	0.19	2/2	0.45-0.99	0.72

Preoperational data - from January 1979-July 1982
Operational data - from January-December 1986
* Concentrations listed are in units of pCi/g, wet weight

TABLE F-3

KELP
PREOPERATIONAL AND OPERATIONAL DATA #
SONGS UNITS 2 AND 3

Radionuclide	Period*	Indicator* Freq. of Detection	Indicator* Range	Indicator* Average	Control* Freq. of Detection	Control* Range	Control* Average
Bound H-3	Preop	5/21	1.20-2.40	1.66	1/7	1.70-1.70	1.70
Bound H-3	Op	0/6	<LLD	<LLD	0/3	<LLD	<LLD
K-40	Preop	3/21	2.10-5.20	3.83	1/7	2.40-2.40	2.40
K-40	Op	6/6	5.2-8.3	6.8	3/3	5.3-7.3	6.5
Mn-54	Preop	1/21	0.005-0.005	0.005	0/7	<LLD	<LLD
Mn-54	Op	0/6	<LLD	<LLD	0/3	<LLD	<LLD
Co-57	Preop	0/21	<LLD	<LLD	0/7	<LLD	<LLD
Co-57	Op	0/6	<LLD	<LLD	0/3	<LLD	<LLD
Co-58	Preop	0/21	<LLD	<LLD	0/7	<LLD	<LLD
Co-58	Op	0/6	<LLD	<LLD	0/3	<LLD	<LLD
Fe-59	Preop	0/21	<LLD	<LLD	0/7	<LLD	<LLD
Fe-59	Op	0/6	<LLD	<LLD	0/3	<LLD	<LLD
Co-60	Preop	2/21	0.006-0.009	0.0075	0/7	<LLD	<LLD
Co-60	Op	0/6	<LLD	<LLD	0/3	<LLD	<LLD
Zr(Nb)-95	Preop	6/21	0.014-0.090	0.47	2/7	0.018-0.053	0.036
Zr(Nb)-95	Op	0/6	<LLD	<LLD	0/3	<LLD	<LLD
Ag-110m	Preop	0/21	<LLD	<LLD	0/7	<LLD	<LLD
Ag-110m	Op	0/6	<LLD	<LLD	0/3	<LLD	<LLD
I-131	Preop	6/21	0.011-0.024	0.017	2/7	0.010-0.030	0.020
I-131	Op	5/6	0.008-0.25	0.12	3/3	0.049-0.129	0.076
Cs-134	Preop	0/21	<LLD	<LLD	0/7	<LLD	<LLD
Cs-134	Op	0/6	<LLD	<LLD	0/3	<LLD	<LLD
Cs-137	Preop	5/21	0.004-0.006	0.0050	0/7	<LLD	<LLD
Cs-137	Op	6/6	0.0026-.0057	0.0044	2/3	0.0034-0.0044	0.0039
Ce-144	Preop	0/21	<LLD	<LLD	0/7	<LLD	<LLD
Ce-144	Op	0/6	<LLD	<LLD	0/3	<LLD	<LLD
Ra-226	Preop	0/21	<LLD	<LLD	0/7	<LLD	<LLD
Ra-226	Op	0/6	<LLD	<LLD	0/3	<LLD	<LLD
Th-228	Preop	0/21	<LLD	<LLD	0/7	<LLD	<LLD
Th-228	Op	0/6	<LLD	<LLD	0/3	<LLD	<LLD

Preoperational data - from January 1979-July 1982
Operational data - from January-December 1986
* Concentrations listed are in units of pCi/g, wet weight

APPENDIX G

DEVIATIONS FROM TECHNICAL SPECIFICATION SAMPLING REQUIRMENTS

DEVIATIONS FROM TECHNICAL SPECIFICATION SAMPLING REQUIREMENTS

Sample Type	Location No.	Date	Requirement	Deviations from Requirements/ Corrective Actions (See Notes)
Air	3	01/14/86-01/28/86	Meet maximum LLD	Low volume of air collected due to abnormal loading of filter.
Air	11	01/28/86-02/04/86	Continuous collection	16.9 hours of collection time was lost due to a power outage.
Air	9	02/04/86-02/11/86	Continuous collection	115.9 hours of collection time was lost due to a trenching machine cutting through the air samplers buried power cable.
Air	11	03/04/86-03/11/86	Continuous collection	94.0 hours of collection time was lost due to a loss of power.
Air	11	03/11/86-03/18/86	Continuous collection	168 hours of collection time was lost due to a power outage.
Air	11	03/18/86-03/25/86	Continuous collection	80.2 hours of collection time was lost due to a power outage.
Air	10	03/25/86-04/01/86	Continuous collection	No sample was collected due to a power outage.
Air	10	04/01/86-04/08/86	Continuous collection	167.2 hours of collection time was lost due to a power outage.
Air	10	04/08/86-04/15/86	Continuous collection	No sample was collected due to a power outage.
Air	10	04/15/86-04/22/86	Continuous collection	36 hours of collection time was lost due to a loss of power. The outage was due ultimately to a malfunction of a State D.H.S. air sampler.
Air	6	04/15/86-04/22/86	Continuous collection	5.2 hours of collection time was lost due to a power outage at the Met. compound.
Air	12	04/15/86-04/22/86	Continuous collection	31.3 hours of collection time was lost due to sampler installation on 04/15/86 at 3 P.M.
Air	6	04/22/86-04/29/86	Continuous collection	59.8 hours of collection time was lost due to a planned power outage for maintenance of other equipment served by the same power source.
Air	10	05/06/86-05/13/86	Continuous collection	58.2 hours of collection time was lost due to a power outage.
Air	10	05/13/86-05/20/86	Continuous collection	Approximately 60 hours of collection time was lost due to a power outage.
Air	10	05/27/86-06/03/86	Continuous collection	55.8 hours of collection time was lost due to a breaker maintenance scheduled with a Unit 1 outage.

Notes:

1. Power outages observed - These were the result of an unprecedented amount of maintenance activity associated with the Unit 1 refueling outage and in reconfiguration of power distribution to the Mesa facilities. Due to the one-time nature of these maintenance activities, it is not anticipated that such outages will recur. However, the importance of maintaining reliable power supply to the air samplers has been emphasized to the Equipment Control Department.
2. Low volume of air - The air samplers are inspected mid-week to lower the probability of loss of sample due to dust loading. Additional corrective action is not considered applicable.

DEVIATIONS FROM TECHNICAL SPECIFICATION SAMPLING REQUIREMENTS

Sample Type	Location No.	Date	Requirement	Deviations from Requirements/ Corrective Actions (See Notes)
Air	6	06/03/86-06/10/86	Continuous collection	98.0 hours of collection time was lost due to breaker maintenance scheduled with the Unit 1 outage.
Air	10	06/03/86-06/10/86	Continuous collection	63.8 hours of collection time was lost due to breaker maintenance scheduled with the Unit 1 outage.
Air	6	06/10/86-06/17/86	Continuous collection	160.3 hours of collection time was lost due to breaker maintenance scheduled with the Unit 1 outage.
Air	12	06/17/86-06/24/86	Continuous collection	10.0 hours of collection time was lost due to an interruption in power.
Air	2	07/01/86-07/08/86	Continuous collection	10.4 hours of collection time was lost due to a power failure.
Crops	1	06/25/86	Collect leafy vegetables	Fleshy vegetables were substituted for the unavailable leafy variety.
Air	11	08/05/86-08/12/86	Continuous collection	7.9 hours of collection time was lost due to a planned power outage at the SONGS Mesa area. The outage occurred due to a shifting of the Mesa 12kV power source from SDG&E to Edison.
Air	9	08/12/86-08/19/86	Continuous collection	8.9 hours of collection time was lost due to a power outage caused by the modification of existing underground power lines.
Air	11	08/12/86-08/19/86	Continuous collection	36.5 hours of collection time was lost due to a switchover of 12kV power from an existing SDG&E system to SCE.
Air	2	08/19/86-08/26/86	Continuous collection	3.7 hours of collection time was lost due to a power outage of undetermined origin.
Direct Radiation	5	07/01/86-09/30/86	Sample acquisition	Sample lost due to Marine Corps activities.
Air	3	10/14/86-10/21/86	Meet Maximum LLD for I-131 (0.07 pCi/m3)	A low volume of air was collected due to abnormal loading of filter.

Notes:
1. Power outages observed - These were the result of an unprecedented amount of maintenance activity associated with the Unit 1 refueling outage and in reconfiguration of power distribution to the Mesa facilities. Due to the one-time nature of these maintenance activities, it is not anticipated that such outages will recur. However, the importance of maintaining reliable power supply to the air samplers has been emphasized to the Equipment Control Department.
2. Low volume of air - The air samplers are inspected mid-week to lower the probability of loss of sample due to dust loading. Additional corrective action is not considered applicable.

DEVIATIONS FROM TECHNICAL SPECIFICATION SAMPLING REQUIREMENTS

Sample Type	Location No.	Date	Requirement	Deviations from Requirements/ Corrective Actions (See Notes)
Crops	1	11/10/86	Collect leafy vegetables	Fleshy vegetables were substituted for the unavailable leafy variety.
Air	1	12/16/86-12/23/86	Continuous collection	103.8 hours of collection time was lost due to an unknown problem.
Air	1	12/23/86-12/30/86	Continuous collection	168 hours of collection time was lost due to a breaker trip. No sample.
Direct Radiation	5	01/01/86-12/31/86	Sample acquisition	Sample lost due to Marine Corps activities.

Notes:

1. Power outages observed - These were the result of an unprecedented amount of maintenance activity associated with the Unit 1 refueling outage and in reconfiguration of power distribution to the Mesa facilities. Due to the one-time nature of these maintenance activities, it is not anticipated that such outages will recur. However, the importance of maintaining reliable power supply to the air samplers has been emphasized to the Equipment Control Department.
2. Low volume of air - The air samplers are inspected mid-week to lower the probability of loss of sample due to dust loading. Additional corrective action is not considered applicable.

APPENDIX H

LAND USE CENSUS

PART A. 1986 LAND USE CENSUS

INTRODUCTION

This section explains the purpose of the land use survey, defines the land uses studied, defines the five-mile study area, overviews the methodology and survey procedures, and describes the report format and supporting materials.

1. Purpose Of The Land Use Census

William C. Lawrence Company (WCLC) was contracted to identify land uses within a five-mile radius of Southern California Edison Company's San Onofre Nuclear Generation Station (SONGS). See Figure H.1 for a map of the study area.

The overall objective of the census is to identify radiological pathways to man. The purpose of this census is to locate and document the nearest residences, milk animals, meat animals, gardens (of at least 500 square feet producing fleshy or leafy vegetables), and other specified uses (campgrounds, employment, etc.), in each of the 16 meteorological sectors within five miles of SONGS. This study is updated annually. All such uses within the study area are identified, not only the nearest. Additionally, information on how long a person or persons will be at closest (and certain other) non-residential uses is collected. This information is required by SONGS Technical Specifications.

2. Definition Of Uses

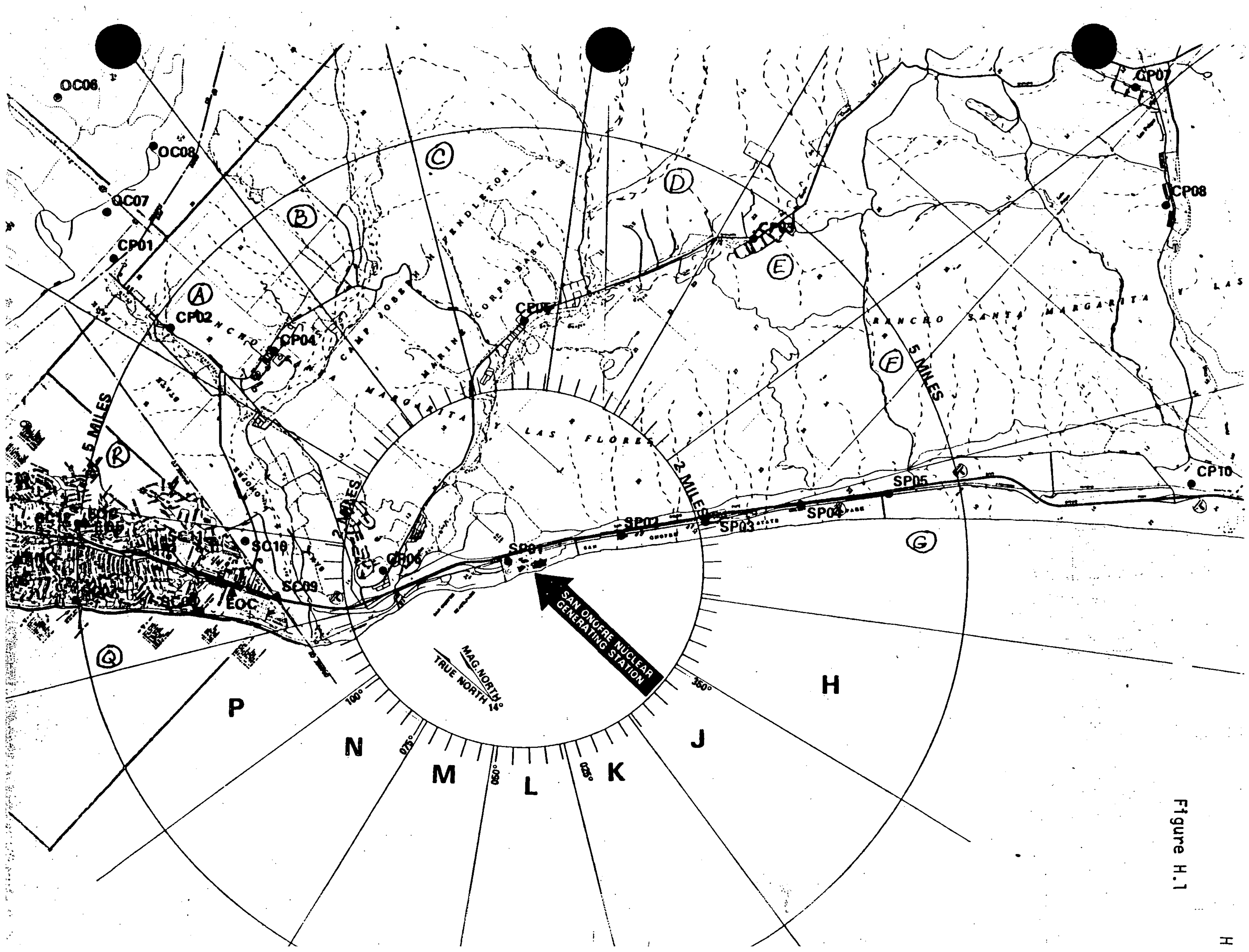
Residence is defined as any structure (single family house, apartment, mobile home, barracks or similar type unit), which is occupied by an individual(s) or resident(s) for three months (2,000 hours) or longer in a given year.

Other Specified Use is defined as a location occupied by members of the general population as other than their primary residence. The use is divided into two categories: employment and non-employment related.

Employment use is defined as a location occupied by members of the general population engaged in normal work activities regardless of the length of time spent at the location, or regardless of its permanence, including concession stands, restaurants, markets, and guard shacks.

Non-employment related use is defined as a location occupied by members of the general population who are not engaged in normal work activities, including campgrounds, temporary housing, timeshare condominiums, motels, hotels, schools, and beaches.

Milk animals are cows, goats or sheep, whose milk is used in dairy products for human consumption.



OC06
OC08
OC07
CP01
CP02
CP04
CP07
CP08
CP10
SP01
SP02
SP03
SP04
SP05
SC09
SC10
EOC
A
B
C
D
E
F
G
H
J
K
L
M
N
P
Q
R
5 MILES
2 MILES
RANCHO SANTA MARGARITA Y LAS FLORES
CAMP JOSEPH H PENDLETON MARINE CORPS BASE
SAN ONOFRE NUCLEAR GENERATING STATION
MAG.NORTH
TRUE NORTH
14°
350°
100°
075°
050°
025°

Figure H.1

Meat animals are cattle, goats or sheep, whose meat is used for human consumption.

Fresh, leafy vegetables include examples such as lettuce, cabbage, and spinach. Other vegetables, known as "fleshy" vegetables, were also included in the census. Fleshy vegetables include, for instance, tomatoes, cucumbers, cauliflower, and sweet corn.

3. Findings by Sector

Sector P (West Northwest)

This sector is mainly the Pacific Ocean but includes a sliver of land containing Enlisted Beach (military), San Onofre State Beach (public), the U. S. Coast Guard Loran Tracking Station at San Mateo Point, and the westernmost tip of the City of San Clemente.

Residences. The closest residential use to SONGS is Cotton Point, owned by Mr. Gavin Herbert. He has subdivided the property into 17 improved home sites ready for construction. Mr. Herbert uses the house on an irregular basis, but a guard lives in a guest house on a permanent basis. Additional housing is found north of the area in the Cypress Shore development.

Gardens, Milk and Meat Animals. No instances of these uses are found in Sector P.

Other Specified. San Onofre Beach (Surf Beach) is the closest use to the SONGS facility. It is a day-use area exclusively; use is confined to parking and beach use. The daily use at peak season (July 4) is about 500 cars at three persons per car, or a total of 1,500 persons. Lifeguard stations and change rooms are located along the beach. Employment uses on the beach include mobile (in jeeps) and stationary (in towers) lifeguards. Total high season staffing for all beaches (Surf Beach, San Onofre State Beach, Trestles Beach and San Clemente State Beach) is 86 lifeguards. Each guard works eight hours per day (40 hours per week) and is rotated among the beaches, so a worst case exposure time is estimated at 10 hours per week at the closest point (500 hours per year). No estimate of lifeguard time on individual beaches is possible as assignments are constantly rotated.

Enlisted Beach is a Marine recreation area and contains 123 camping spaces and 10 mobile homes on foundations. The camping spaces are occupied by mobile homes, RV's, trailers, and tents. Maximum stay at the campground is 30 days in the winter and seven days in the summer. Capacity of the camping area is approximately 470 persons. Only a small portion of this area is contained within Sector P--the majority is found in Sector Q. Sector P does contain a trailer containing the campground check-in. The check-in facility is open seven days per week. Four

8:18 THURSDAY, APRIL 23, 1987

Southern California Edison Company Environmental Monitoring Program Database Listings

Verified by: Mina Courtney, Ph.D. Date: 4/23/87

Table 2: Weekly Airborne Particulates Gross Beta Activity

Control Location: #3

Observation Number	Calendar Date	Location #1	Location #1 (2 sigma)	Location #2	Location #2 (2 sigma)	Location #3	Location #3 (2 sigma)	Location #4
1428	04/01/86	0.014	0.001	0.022	0.001	0.014	0.001	*
1429	04/08/86	0.011	0.001	0.016	0.001	0.014	0.001	*
1430	04/15/86	0.012	0.001	0.018	0.001	0.012	0.001	*
1431	04/22/86	0.013	0.001	0.018	0.001	0.018	0.001	*
1432	04/29/86	0.019	0.001	0.028	0.001	0.016	0.001	*
1433	05/06/86	0.013	0.001	0.016	0.001	0.017	0.001	*
1434	05/13/86	0.390	0.020	0.084	0.004	0.290	0.010	*
1435	05/20/86	0.460	0.020	0.640	0.030	0.720	0.040	*
1436	05/27/86	0.220	0.010	0.290	0.010	0.210	0.010	*
1437	06/03/86	0.076	0.004	0.100	0.005	0.079	0.004	*
1438	06/10/86	0.031	0.002	0.046	0.002	0.038	0.002	*
1439	06/17/86	0.041	0.002	0.052	0.002	0.032	0.002	*

Observation Number	Calendar Date	Location #4 (2 sigma)	Location #5	Location #5 (2 sigma)	Location #6	Location #6 (2 sigma)	Location #9	Location #10
1428	04/01/86	*	0.018	0.001	0.019	0.001	0.022	0.360
1429	04/08/86	*	0.011	0.001	0.018	0.001	0.013	*
1430	04/15/86	*	0.017	0.001	0.013	0.001	0.019	*
1431	04/22/86	*	0.020	0.001	0.016	0.001	0.011	0.025
1432	04/29/86	*	0.022	0.001	0.021	0.001	0.023	0.021
1433	05/06/86	*	0.018	0.001	0.020	0.001	0.008	0.016
1434	05/13/86	*	0.380	0.020	0.170	0.008	0.240	0.032
1435	05/20/86	*	0.890	0.040	0.640	0.030	0.560	0.550
1436	05/27/86	*	0.260	0.010	0.230	0.010	0.240	0.270
1437	06/03/86	*	0.127	0.006	0.113	0.007	0.068	0.146
1438	06/10/86	*	0.039	0.002	0.026	0.002	0.044	0.068
1439	06/17/86	*	0.055	0.003	0.080	0.004	0.052	0.042

Observation Number	Calendar Date	Location #11	Location #9 (2 sigma)	Location #10 (2 sigma)	Location #11 (2 sigma)	Location #12	Location #12 (2 sigma)
1428	04/01/86	0.031	0.001	0.040	0.002	*	*
1429	04/08/86	0.014	0.001	*	0.001	*	*
1430	04/15/86	0.019	0.002	*	0.001	*	*
1431	04/22/86	0.020	0.001	0.001	0.001	0.020	0.001
1432	04/29/86	0.027	0.001	0.001	0.001	0.020	0.001
1433	05/06/86	0.015	0.001	0.001	0.001	0.018	0.001
1434	05/13/86	0.076	0.010	0.002	0.005	0.240	0.010
1435	05/20/86	0.890	0.030	0.030	0.040	0.670	0.030
1436	05/27/86	0.290	0.010	0.010	0.010	0.260	0.010
1437	06/03/86	0.101	0.004	0.008	0.002	0.099	0.006
1438	06/10/86	0.059	0.002	0.003	0.003	0.046	0.002
1439	06/17/86	0.045	0.003	0.002	0.002	0.057	0.003

Southern California Edison Company Environmental Monitoring Program Database Listings

Verified by: Mina Goeders, Ph.D. Date: 4/23/87

Table 2: Weekly Airborne Particulates Gross Beta Activity

Control Location: #3

Observation Number	Calendar Date	Location #1	Location #1 (2 sigma)	Location #2	Location #2 (2 sigma)	Location #3	Location #3 (2 sigma)	Location #4
1416	01/07/86	0.029	0.002	0.027	0.002	0.027	0.002	0.029
1417	01/14/86	0.024	0.001	0.022	0.001	0.023	0.001	0.020
1418	01/21/86	0.026	0.002	0.036	0.002	0.025	0.002	0.036
1419	01/28/86	0.023	0.001	0.031	0.002	0.048	0.003	0.026
1420	02/04/86	0.014	0.001	0.017	0.001	0.012	0.001	0.017
1421	02/11/86	0.015	0.001	0.017	0.001	0.016	0.001	0.018
1422	02/18/86	0.014	0.001	0.018	0.001	0.018	0.001	0.010
1423	02/25/86	0.010	0.001	0.019	0.001	0.014	0.001	0.010
1424	03/04/86	0.014	0.001	0.017	0.001	0.019	0.001	0.016
1425	03/11/86	0.022	0.001	0.023	0.001	0.019	0.001	0.010
1426	03/18/86	0.010	0.001	0.010	0.001	0.010	0.001	0.010
1427	03/25/86	0.010	0.001	0.024	0.001	0.027	0.002	0.023

Observation Number	Calendar Date	Location #4 (2 sigma)	Location #5	Location #5 (2 sigma)	Location #6	Location #6 (2 sigma)	Location #9	Location #10
1416	01/07/86	0.002	0.023	0.001	0.021	0.001	0.025	0.023
1417	01/14/86	0.001	0.024	0.001	0.024	0.001	0.021	0.022
1418	01/21/86	0.002	0.027	0.002	0.020	0.001	0.043	0.028
1419	01/28/86	0.002	0.047	0.003	0.039	0.002	0.021	0.037
1420	02/04/86	0.001	0.016	0.001	0.018	0.001	0.018	0.014
1421	02/11/86	0.001	0.018	0.001	0.018	0.001	0.014	0.020
1422	02/18/86	0.001	0.011	0.001	0.014	0.001	0.018	0.016
1423	02/25/86	0.001	0.010	0.001	0.010	0.001	0.010	0.013
1424	03/04/86	0.001	0.022	0.001	0.017	0.001	0.019	0.014
1425	03/11/86	0.001	0.017	0.001	0.024	0.001	0.017	0.014
1426	03/18/86	0.001	0.010	0.001	0.010	0.001	0.010	0.010
1427	03/25/86	0.001	0.016	0.001	0.014	0.001	0.015	0.029

Observation Number	Calendar Date	Location #11	Location #9 (2 sigma)	Location #10 (2 sigma)	Location #11 (2 sigma)	Location #12	Location #12 (2 sigma)
1416	01/07/86	0.030	0.002	0.002	0.002	*	*
1417	01/14/86	0.023	0.001	0.001	0.001	*	*
1418	01/21/86	0.045	0.002	0.001	0.002	*	*
1419	01/28/86	0.052	0.001	0.002	0.003	*	*
1420	02/04/86	0.015	0.001	0.001	0.001	*	*
1421	02/11/86	0.018	0.001	0.001	0.001	*	*
1422	02/18/86	0.020	0.001	0.001	0.001	*	*
1423	02/25/86	0.014	0.001	0.001	0.001	*	*
1424	03/04/86	0.031	0.001	0.001	0.002	*	*
1425	03/11/86	0.036	0.001	0.001	0.002	*	*
1426	03/18/86	*	0.001	0.001	*	*	*
1427	03/25/86	0.027	0.001	0.001	0.001	*	*

10:37 MONDAY, APRIL 20, 1987

Southern California Edison Company Environmental Monitoring Program Database Listings

Verified by: Mina Goeders, Ph.D. Date: 4/20/87

Table 1b: Annual Gamma Exposure

Control Location: #14

Observation Number	Calendar Date	Location #1	Location #2	Location #3	Location #4	Location #5	Location #6	Location #7	Location #8	Location #9	Location #10	Location #11	Location #12
12	12/31/86	86.7	104.3	90.4	92.2	*	70.5	85.1	87.8	90.5	93.8	92.3	88.5

Observation Number	Calendar Date	Location #13	Location #14	Location #15	Location #16	Location #17	Location #18	Location #19	Location #20	Location #21	Location #22	Location #23	Location #24
12	12/31/86	109.9	97.3	74.3	104	41.1	45.3	97.6	93.2	86.8	86.3	85.8	92.5

Observation Number	Calendar Date	Location #25	Location #26	Location #27	Location #28	Location #29	Location #30	Location #31	Location #32	Location #33	Location #34	Location #35	Location #36
12	12/31/86	86.7	91.4	81	90.4	93.6	89	92.3	83	89.4	83.1	88.9	99

Observation Number	Calendar Date	Location #37	Location #38	Location #39	Location #40	Location #41	Location #42	Location #43	Location #44	Location #45	Location #46	Location #47	Location #48
12	12/31/86	100.7	66.8	87	89.8	84.1	105.5	76.3	72.1	77.2	65.9	75.7	81.8

Observation Number	Calendar Date	Location #49	Location #50	Location #51	Location #52	Location #53	Location #54	Location #55	Location #56	Location #57	Location #58	Location #59
12	12/31/86	82.6	76.2	76.1	76.3	79.2	88	123.3	108.1	96.4	97	98.4

N= 1

Southern California Edison Company Environmental Monitoring Program Database Listings

Verified by: Mina Goeden, Ph.D. Date: 4/20/87

Table 1A: Quarterly Gamma Exposure

Control Location: #14

Observation Number	Calendar Date	Location #1	Location #2	Location #3	Location #4	Location #5	Location #6	Location #7	Location #8	Location #9	Location #10	Location #11	Location #12
45	03/31/86	18.9	22.7	19.3	19.8	18.7	15.7	18.5	18.5	19.0	19.9	19.1	19.5
46	06/30/86	20.0	22.6	19.9	20.0	19.4	16.3	19.0	19.1	20.6	20.5	20.0	19.4
47	09/30/86	*	*	*	*	*	*	*	*	*	*	*	*
48	12/31/86	19.9	23.4	20.4	20.7	19.2	16.2	18.6	19.8	20.7	20.9	20.4	19.9

Observation Number	Calendar Date	Location #13	Location #14	Location #15	Location #16	Location #17	Location #18	Location #19	Location #20	Location #21	Location #22	Location #23	Location #24
45	03/31/86	17.5	21.7	18.3	18.3	10.1	9.8	21.5	21.0	20.6	19.6	19.3	20.3
46	06/30/86	17.9	21.2	16.7	18.2	9.9	9.4	18.0	19.7	17.5	17.7	17.8	19.8
47	09/30/86	*	*	*	*	*	*	*	*	*	*	*	*
48	12/31/86	35.4	22.7	17.0	30.4	9.2	9.3	21.2	20.6	19.7	19.1	20.1	20.9

Observation Number	Calendar Date	Location #25	Location #26	Location #27	Location #28	Location #29	Location #30	Location #31	Location #32	Location #33	Location #34	Location #35	Location #36
45	03/31/86	19.3	20.6	18.8	21.0	21.2	20.3	21.0	19.3	20.6	19.0	19.3	21.5
46	06/30/86	18.8	19.7	18.4	19.4	19.7	18.3	18.8	17.4	19.2	18.3	18.6	20.0
47	09/30/86	*	*	*	*	*	*	*	18.5	20.5	19.8	19.0	21.9
48	12/31/86	19.3	20.3	18.8	20.5	21.3	20.6	20.1	19.0	20.1	19.4	20.0	21.3

Observation Number	Calendar Date	Location #37	Location #38	Location #39	Location #40	Location #41	Location #42	Location #43	Location #44	Location #45	Location #46	Location #47	Location #48
45	03/31/86	22.1	15.2	20.3	21.9	19.2	23.4	18.2	17.7	18.0	15.7	17.6	18.9
46	06/30/86	21.2	14.4	19.4	19.5	18.4	19.6	16.4	15.2	17.1	14.6	15.4	16.7
47	09/30/86	23.1	15.7	19.7	20.8	19.1	24.2	18.1	17.6	18.2	16.0	16.5	17.9
48	12/31/86	22.3	15.0	19.1	20.6	18.4	23.0	17.8	17.0	17.7	14.9	17.0	18.5

Observation Number	Calendar Date	Location #49	Location #50	Location #51	Location #52	Location #53	Location #54	Location #55	Location #56	Location #57	Location #58	Location #59
45	03/31/86	18.7	17.4	17.5	17.2	18.8	19.6	25.7	23.7	23.3	22.8	22.0
46	06/30/86	17.7	16.8	16.8	16.5	17.1	17.0	23.0	21.9	19.1	19.6	20.6
47	09/30/86	17.8	16.9	16.9	17.1	17.7	19.0	26.7	23.5	22.3	20.8	21.8
48	12/31/86	17.7	16.7	16.7	17.4	17.7	18.2	23.8	22.8	21.3	20.4	20.7

N= 4

APPENDIX I

RADIOLOGICAL ENVIRONMENTAL (RAW) DATA TABLES FOR 1986

PART C. SIGNIFICANCE OF NEW/CHANGED LAND USES

None of the new locations identified in the 1986 Land Use Census identify locations which yield calculated doses greater than those currently calculated in accordance with Technical Specification 3.18.2 (Unit 1) and 3/4.12.2 (Units 2/3).

Sector G

The distance to the closest "other specified" use (San Onofre State Beach) is 1.0 miles from SONGS Unit 1, rather than the 1.3 miles shown on the 1985 Land Use Census Summary Sheet.

The discrepancy was noted while preparing the draft 1986 Land Use Census Summary Sheet.

Sector R

The distance to the closest meat animals is .9 miles from SONGS Unit 1, rather than the 1.4 miles shown on the 1985 and draft 1986 SONGS Unit 1 Land Use Census Summary Sheet.

The discrepancy was noted while preparing the final 1986 Land Use Census Summary Sheet.

No other changes in closest uses were identified.

PART B. HIGHLIGHT OF CHANGES FROM THE 1985 CENSUS

INTRODUCTION

Two new closest "other specified" uses have been identified in Sectors A (SONGS Units 2 and 3) and E (SONGS Units 1, 2 and 3). Both are motor pools located next to Marine barrack camps. Also, the distances to the closest "other specified" use to SONGS Unit 1 in Sector G and to the closest meat animals in Sector R were shown incorrectly in 1985.

Changes for sector are explained below.

Sector A

A motor pool, 3.6 miles from SONGS Units 2 and 3, has been located at the northwestern end of Camp San Mateo. The motor pool houses equipment and vehicles for a Marine Combat Engineer Battalion and the 7th Marines. The facility was previously identified only as a support facility for the camp, and thus not noted separately.

The motor pool constitutes a new land use for SONGS Units 2 and 3. It is not, however, a nearest "other-specified" land use for SONGS Unit 1 because the Camp San Mateo Sewage Treatment Plant is still closer to Unit 1 in this sector.

Approximately 180 persons work at the site, of which 75 percent (135 persons) are stationed at Camp San Mateo. The remaining 25 percent (45 persons) commute from other parts of the base or from off-base. Persons at the site work eight hours per day, five days per week, for an annual exposure time of 2,000 hours (40 hours per week x 50 work weeks per year).

Sector E

Another motor pool has been located at the northwestern end of Camp Horno. The motor pool is located 4.0 miles from SONGS Units 2 and 3, and 4.2 miles from SONGS Unit 1. The motor pool houses some equipment and vehicles for Marine units not located in Camp Horno. The facility was previously identified only as a support facility for the camp, and thus not noted separately.

Approximately 100 persons work at the site, of which 75 percent (75 persons) are stationed at Camp Horno. The remaining 25 percent (25 persons) commute from other parts of the base, or from off-base. Persons at the site work an average of 10 hours per day, five days per week, for an annual exposure time of 2,500 hours (50 hours per week x 50 work weeks per year).

Other Specified. The closest other specified use to SONGS is San Onofre State Park and Beach Campground (see narrative in Sector F). Estimated maximum annual exposure time is 500 hours.

A Highway Patrol Weigh Station is located on the west side of the San Diego Freeway. See Sector F for discussion of staffing and work hours.

Sectors H, J, K, L, M, and N

Sectors H, J, K, L, M, and N do not contain any of the land uses in question. These sectors contain only a small portion of the plant site, a public beach, and beach walkway. The beach walkway provides an access path between beaches north and south of the plant.

South of the guard shack is a new ranger station. The station will be manned by one of seven rangers stationed at the beach for two hours per day, year-round. Because ranger assignments are constantly rotated among the four beaches, and there are seven rangers at this beach, the annual exposure time is 1/4 (4 beaches) x 1/7 (7 rangers) x 500 (hours spent in shack) = 20 hours.

Tony's Market, which was housed in a trailer south of the guard shack, is closed. The market will probably not reopen before Spring of 1987, and possibly not even then. The park also has a campground. Peak season daily use of the campground (which also extends to Sector G) is as follows:

Campers (Bluffs area):	221 campers x 3 persons per camper	663
Day use walk-in visitors:	600 x 3 persons per car	1,800
TOTAL		2,463

These figures are based on a hypothetical July 4 weekend. The maximum length of stay in summer months is 15 days (30 days in the winter), and total annual stay cannot exceed 30 days.

A Highway Patrol Weigh Station and Border Patrol checkpoint are located on the east side of the San Diego Freeway. The Border Patrol checkpoint is manned 24 hours a day, 365 days per year; the maximum length of stay for one person is 50 hours per week and 2,500 hours per year. Total employment at the site is 80 persons, with an average of 12 on the site at any one time. There is also a holding facility for up to 100 aliens who may be detained for seven hours before being transported south. The Weight Station is usually manned for two eight hour shifts, with ten persons per shift. Once every three months, a third shift is added for one week. There are 12 full-time Commercial Vehicle Inspection Specialists, seven uniformed officers, and one janitor stationed at the site. Employees work an average of 40 hours per week or 2,000 hours per year.

Sector G (Southeast)

Residences. No residential uses were identified in Sector G.

Gardens. No gardens greater than 500 square feet were located in Sector G.

Milk Animals. No milk animals were identified in Sector G.

Meat Animals. Sheep are grazed in this sector between January and June or July under a lease agreement between the Marine Corps and Etchegaray Livestock, a private firm. The closest the animals could be to SONGS in Sector G is 2.7 miles. No animals, however, were sighted in Sector G this year.

Sector E (East)

Residences. The closest residential use to SONGS is Camp Horno. See Table H.1 for details.

Gardens. No gardens greater than 500 square feet were located in Sector E.

Milk Animals. No milk animals were identified in Sector E.

Meat Animals. Sheep are grazed in this sector between January and June or July under a lease agreement between the Marine Corps and Etchegaray Livestock, a private firm. The closest the animals could be to SONGS in Sector E is 0.3 miles. No animals, however, were sighted in Sector E this year.

Other Specified. The closest other specified use in Sector E is a motor pool at the northwest end of Camp Horno. The motor pool houses equipment and vehicles for the 1st Marines, and is staffed by approximately 100 persons. About 75 percent (75 persons) are stationed at Camp Horno. The other 25 persons commute from other parts of the base or from off-base. Persons at the site average 10 hours a day, five days a week (50 hours per week or 2,500 hours per year).

A truck company for the 1st Marines is located at the southeast end of Camp Horno, employing about 150 persons. Again, 75 percent (110 persons) are stationed at Camp Horno, with the other 25 percent (40 persons) commuting to the site. Work time at the site averages 50 hours per week, per person (2,500 hours per year).

Sector F (East Southeast)

Residences. No residential uses were identified in Sector F.

Gardens. No gardens greater than 500 square feet were located in Sector F.

Milk Animals. No milk animals were identified in Sector F.

Meat Animals. Sheep are grazed in this sector between January and June or July under a lease agreement between the Marine Corps and Etchegaray Livestock, a private firm. The closest the animals could be to SONGS in Sector F is 0.5 miles. No animals, however, were sighted in Sector F this year.

Other Specified. The closest other specified use to SONGS is the San Onofre State Beach guard shack. The use is designated employment related. The shack is manned by one or two employees for a maximum of 10 hours a day. Employees work a maximum of 40 hours per week but are rotated among duties between all State Park Beaches, so estimated annual exposure time is 500 hours.

The Northern Impact Control Tower is staffed for 12 to 14 hours per day by a rotating crew of six marines (32 hours per week per person or 1,600 hours per year). The tower controls are used in the firing ranges in the north Camp Pendleton area. The only permanently staffed firing range in the study area is manned by 12 marines for 30 hours per week (1,500 hours per year).

Sector C (Northeast)

Residences. The closest residential use in this sector is Camp San Onofre. See Table H.1 for details.

Gardens. No gardens greater than 500 square feet were located in Sector C.

Milk Animals. No milk animals were identified in Sector C.

Meat Animals. Sheep are grazed in this sector between January and June or July under a lease agreement between the Marine Corps and Etchegaray Livestock, a private firm. The closest the animals could be to SONGS in Sector C is 0.2 miles. No animals, however, were sighted in Sector C this year.

Other Specified. The closest other specified use in Sector C is the Camp San Onofre Sewage Treatment Plant. The plant is manned by one person for eight hours per day (40 hours per week or 2,000 hours per year).

The Camp San Onofre Fire Station is manned by rotating crews of four civilian firefighters. Firefighters work an average of 13 shifts per month, at 24 hours per shift. This averages to 70 hours per week per firefighter or 2,500 hours per year. Personnel are assigned to a station for about two years.

Sector D (East Northeast)

Residences. The closest residential use in this sector is Camp San Onofre. See Table H.1 for details.

Gardens. No gardens greater than 500 square feet were located in Sector D.

Milk Animals. No milk animals were identified in Sector D.

Meat Animals. Sheep are grazed in this sector between January and June or July under a lease agreement between the Marine Corps and Etchegaray Livestock, a private firm. The closest the animals could be to SONGS in Sector D is 0.2 miles. No animals, however, were sighted in Sector D this year.

Other Specified. The closest other specified use in Sector D is the Camp Horno Sewage Treatment Plan. The plant is staffed by one person for eight hours per day (40 hours per week or 2,000 hours per year).

Gardens. No instances of gardens greater than 500 square feet were located in Sector A.

Milk Animals. No instances of milk animals were identified in Sector A.

Meat Animals. Sheep are grazed in this sector between January and June or July under a lease agreement between the Marine Corps and Etchegaray Livestock, a private firm. The closest the animals could be to SONGS in Sector A is 0.2 miles. No animals, however, were sighted in Sector A this year.

Other Specified. The closest other specified use in this section is a motor pool at the northwest end of Camp San Mateo. The motor pool houses equipment and vehicles for a Marine Combat Engineer Battalion and the 7th Marines. Approximately 180 persons work at the site, of which 75 percent (135 persons) are stationed at Camp San Mateo. The remaining 45 persons commute from other parts of the base or from off-base. Persons at the site work eight hours a day, five days a week (2,000 hours per year).

A gas station is located in this sector. The station is staffed by one person for eight hours per day, five days a week (40 hours per week or 2,000 hours per year).

The Cristianitos Fire Station is manned by rotating crews of four civilian firefighters. Firefighters work an average of 13 shifts per month, at 24 hours per shift. This averages to 70 hours per week per firefighter or 2,500 hours per year. Personnel are assigned to a station for about two years. Edison land uses are located in this area.

Sector B (North Northeast)

Residences. No instances of residential uses were identified in Sector B.

Gardens. No gardens greater than 500 square feet were located in Sector B.

Milk Animals. No milk animals were identified in Sector B.

Meat Animals. Sheep are grazed in this sector between January and June or July under a lease agreement between the Marine Corps and Etchegaray Livestock, a private firm. The closest the animals could be to SONGS in Sector B is 0.2 miles. No animals, however, were sighted in Sector B this year.

Other Specified. A sanitary landfill serving Camp Pendleton is the closest other specified use in Sector B. The site is manned by one equipment operator for 37.5 hours per week (1,875 hours per year).

Table H.1

Camp Pendleton Residential Land Uses

Area	Sector	Population	Units	Length of Stay	Resident Characteristics	Type of Building	Other Uses
San Onofre Heights	Q, R	3,003 (total)	940 (total)	Average - 3 yrs. Range - 1 to 5+ yrs.	Enlisted and officers	Single-family units	School
San Onofre Mobile Homes	R	485	149	Average - 3 yrs. Range - 1 to 5+ yrs.	Enlisted and officers	Mobile homes on foundations	Commissary, food store and gas station nearby
Camp San Mateo	A	1,899	N/A	Average - 1.5 to 2 yrs.	Enlisted	Barracks	Support facilities, motor pool
Camp San Onofre	C, D	1,660	N/A	Average - 3 to 6 yrs. 200 instructors stay 3 yrs.	Infantry training school	Barracks	Educational, commercial support facilities, fire station, motor pool
Camp Honro	E	1,612	N/A	Average - 1.5 to 2 yrs., max. 3 yrs.	State of readiness units	Barracks	Support building, motor pool

the site is 50 to 60 hours per week for the operators. The stands also have several part-time employees. Maximum estimated annual exposure time is 1,040 hours at the closer stand and 865 hours at the T Street stand. Non-employment related uses in the City include several schools and a time-share condominium complex.

Sector R (North Northwest)

Residences. The closest residential use to SONGS is the San Onofre Mobile Home Park, a military housing project.

A portion of the San Onofre Heights (see narrative in Sector Q) extends into this sector.

The northern and most recently constructed portion of the San Clemente residential area lies in Sector R; a fairly substantial stock of serviced, but as yet undeveloped, lots exist.

Gardens. The San Clemente Ranch is the closest garden of over 500 square feet in Sector R; this includes a non-contiguous portion of land along San Mateo Road. The crops grown in these areas are the same as Sector Q. An Avocado Grove is located in the City of San Clemente and is estimated to cover one-half acre.

Milk Animals. No milk animals were identified in Sector R.

Meat Animals. Sheep are grazed in this sector between January and June or July under a lease agreement between the Marine Corps and Etchegaray Livestock, a private firm. The closest the animals could be to SONGS in Sector R is 0.9 miles. No animals, however, were sighted in Sector R this year.

Other Specified. The closest other specified use to SONGS is the San Clemente Ranch packing and shipping area. This area is designated commercial. The use includes two guards who live at the site for 11 months per year and up to 70 employees working six months for eight hours per day (40 hours per week). Between 100 and 200 field hands are on the site during harvest times.

Edison land uses are located in this sector. The Camp San Mateo Sewage Treatment Plant is manned by one employee for eight hours per day (40 hours per week or 2,000 hours per year). A guard shack guarding the Cristianitos Road entrance to Camp Pendleton is manned 24 hours per day. The typical duty shift is nine hours, and duty is rotated so a typical serviceperson will stand duty four times per year (36 hours per year).

Sector A (North)

Residences. The closest residential use to SONGS is Camp San Mateo, a military camp. See Table H.1 for details.

A portion of San Onofre Beach is located in this sector, which includes the entrance to the Beach. The entrance is manned by one or two State Park employees for a maximum of 10 hours a day. Employees work a maximum of 40 hours per week but are rotated among duties between all four State Park Beaches. Estimated annual exposure is 500 hours.

The narrative in Sector P outlines the uses of the portion of Enlisted Beach located in Sector Q.

The Enlisted Beach Recreation building is located in this sector. The facility has no permanent staffing. A small portion of Trestles Beach is found in Sector Q (see Sector P for details).

The portion of Sector Q north of the San Diego Freeway contains Edison land uses and the Marine's commercial and guard station uses. The commercial center contains a retail outlet, gas station, Burger King, and day care center which are open seven days a week for eight to ten hours a day. The gas station has 23 full-time and 12 part-time employees. The retail center has 40 full-time and nine part-time employees. The new Burger King has three full-time and 50 part-time employees. The day care center has nine full-time and ten part-time employees. Maximum employee time at the site is 40 hours per week (2,000 hours per year). The guard station at Basilone Road is manned by one marine 24 hours a day. The typical duty shift is nine hours, and duty is rotated so a typical service person will stand duty four times per year (36 hours per year).

San Clemente State Park is located within the City of San Clemente. It contains administrative offices for the Pendleton Coast Area, permanent residences consisting of seven houses and 11 trailers, and a campground area. The administrative offices are staffed by 11 employees for 40 hours per week each (2,000 hours per year). Daily peak use of the park (based on a hypothetical July 4) has been estimated as follows:

Campers:	157 x 3 persons per camper	471
Day Use:	830 autos x 3 persons per auto	2,514
Daily Use:	Auto/walk-in	215
"Bike 'n Hike" Users:		11
TOTAL		3,211

The San Clemente Ranch administrative offices are in this area. The offices are staffed by eight employees for up to 60 hours per week, with a maximum annual exposure of 2,000 hours.

The City of San Clemente has several commercial areas. The primary area is along El Camino Real and extends the length of the study area. Other areas are a gas station and two beach concession stands operated by the City of San Clemente. Operating only from Easter to Labor Day, the beach concession stands are open seven days a week. Maximum amount of time at

There is no land explicitly devoted to agricultural use in the City of San Clemente. Most developed residential lots are small, precluding large (500+ square foot) gardens. However, two gardens greater than 500 square feet were located on vacant lots during the windshield survey of the city. There are a significant number of empty vacant lots which could be converted to gardens.

The first garden is located at 238 Avenida Montalvo and is estimated to be 625 square feet. Leafy and fleshy vegetables are being grown there.

The second garden is located at 224 Avenida Allesandro. The site is estimated to be 600 square feet, and is producing leafy and fleshy vegetables. This garden was not present during the 1985 survey.

Additional gardens between 250 and 500 square feet were identified at the following locations:

1. Between 215 and 219 Avenida Santa Barbara; approximately 325 square feet; leafy and fleshy vegetables.

2. Between 145 and 153 West Avenida Junipero; approximately 275 square feet; leafy and fleshy vegetables.

3. At 2405 Calle Madiera; approximately 275 square feet; leafy and fleshy vegetables.

4. At 105 Esplanade; approximately 400 square feet; fleshy vegetables.

These locations are not mapped because they are not required by SONGS technical specifications. Additional gardens were identified less than 250 square feet, and it is probable that more are located out of sight in backyards.

Milk Animals. No instances of milk producing animals were identified in Sector Q.

Meat Animals. Sheep are grazed in this sector between January and June or July under a lease agreement between the Marine Corps and Etchegaray Livestock, a private firm. The closest the animals could be to SONGS in Sector Q is 1.6 miles. No animals, however, were sighted in Sector Q this year.

Other Specified. The closest other specified use to SONGS is a State Park trailer located in a maintenance yard. The use is designated employment related and contains a maintenance room which is used infrequently for a maximum of five to eight hours per week by one or two persons, for an annual exposure of 400 hours (eight hours/week x 50 work weeks/year).

persons man the trailer for eight hours during the week (Monday through Friday) and one person is on duty on weekends for eight hours per day. Maximum exposure time is 2,000 hours per year. There are seven marine lifeguards on the beach for 32 hours per week from June 1 to October 31. Three permanent maintenance people working 40 hours per week are stationed on the beach, along with five Marine workers (40 hours per week) from May 1 to November 1. Two housekeepers work in the campground from May 1 to October 1.

The portion of the San Onofre State Park north of Enlisted Beach, known as Trestles Beach, is a day-use area. Visitors park east of the San Diego Freeway and walk to the beach. The peak day-use of this area is approximataely 2,200 persons. A lookout tower and communications center is located above Trestles Beach. The lookout tower is manned, during the summer only, by one person (duty rotated among lifeguard staff) from 10 a.m. to 6 p.m. Estimated annual exposure time is 500 hours per year. No one lives or sleeps at the facility, as has been indicated in past years.

The San Mateo Point Loran Coast Guard Station contains a guest house which is used by Coast Guard employees for vacation purposes. The maximum length of stay is seven days, so maximum exposure time is 170 hours/year (seven days x 24 hours/day); the facility is used year around and is occupied 90 percent of the time.

Also, located in this portion of the site are a recreation building, garage/storage building, bath house/change room, and camping area for a maximum of three groups for up to three days. The estimate of the average monthly use of the camping facilities during the summer months is 24 persons per month. The Coast Guard expects the property to be sold by U. S. General Services this year.

Sector Q (Northwest)

This sector contains the northeast half of some of the uses identified in Sector P, as well as major garden, residential, and other specified areas.

Residences. The closest residential use in Sector Q is new housing in San Onofre Heights, a military housing project. San Onofre Heights contains 940 units, housing approximately 3,000 persons. This sector also covers a large portion of the City of San Clemente. The city is primarily residential with some institutional, commercial, and recreational uses. Total population is 31,970 persons.

Gardens. The closest agricultural use greater than 500 square feet is San Clemente Ranch. The San Clemente Ranch is a private business under a long-term lease in an area of north Camp Pendleton (Sectors Q and R). The ranch produces fleshy vegetables; that is, tomatoes, cucumbers, sweet corn, and cauliflower. The ranch is 2.2 miles from SONGS in Sector Q, and 2.3 miles from SONGS in Sector R.

Southern California Edison Company Environmental Monitoring Program Database Listings

Verified by: Muna Goodeter, Ph.D. Date: 4/23/87

Table 2: Weekly Airborne Particulates Gross Beta Activity

Control Location: #3

Observation Number	Calendar Date	Location #1	Location #1 (2 sigma)	Location #2	Location #2 (2 sigma)	Location #3	Location #3 (2 sigma)	Location #4
1440	06/24/86	0.015	0.001	0.018	0.001	0.012	0.001	*
1441	07/01/86	0.016	0.001	0.019	0.001	0.020	0.001	*
1442	07/08/86	0.010	0.001	0.014	0.001	0.010	0.001	*
1443	07/15/86	0.016	0.001	0.014	0.001	0.012	0.001	*
1444	07/22/86	0.014	0.001	0.027	0.001	0.015	0.001	*
1445	07/29/86	0.017	0.001	0.024	0.001	0.020	0.001	*
1446	08/05/86	0.013	0.001	0.018	0.001	0.012	0.001	*
1447	08/12/86	0.018	0.001	0.023	0.001	0.020	0.001	*
1448	08/19/86	0.018	0.001	0.025	0.001	0.016	0.001	*
1449	08/26/86	0.018	0.001	0.021	0.001	0.018	0.001	*
1450	09/02/86	0.010	0.001	0.018	0.001	0.013	0.001	*
1451	09/09/86	0.016	0.001	0.020	0.001	0.021	0.001	*

Observation Number	Calendar Date	Location #4 (2 sigma)	Location #5	Location #5 (2 sigma)	Location #6	Location #6 (2 sigma)	Location #9	Location #10
1440	06/24/86	*	0.017	0.001	0.014	0.001	0.016	0.014
1441	07/01/86	*	0.022	0.001	0.016	0.001	0.018	0.022
1442	07/08/86	*	0.010	0.001	0.012	0.001	0.010	0.010
1443	07/15/86	*	0.014	0.001	0.014	0.001	0.014	0.013
1444	07/22/86	*	0.015	0.001	0.012	0.001	0.018	0.014
1445	07/29/86	*	0.019	0.001	0.024	0.001	0.019	0.023
1446	08/05/86	*	0.014	0.001	0.017	0.001	0.020	0.015
1447	08/12/86	*	0.021	0.001	0.022	0.001	0.017	0.018
1448	08/19/86	*	0.019	0.001	0.015	0.001	0.022	0.021
1449	08/26/86	*	0.027	0.001	0.020	0.001	0.022	0.024
1450	09/02/86	*	0.017	0.001	0.015	0.001	0.015	0.014
1451	09/09/86	*	0.024	0.001	0.024	0.001	0.021	0.018

Observation Number	Calendar Date	Location #11	Location #9 (2 sigma)	Location #10 (2 sigma)	Location #11 (2 sigma)	Location #12	Location #12 (2 sigma)
1440	06/24/86	0.015	0.001	0.001	0.001	0.018	0.001
1441	07/01/86	0.024	0.001	0.001	0.001	0.020	0.001
1442	07/08/86	0.014	0.001	0.001	0.001	0.018	0.001
1443	07/15/86	0.011	0.001	0.001	0.001	0.014	0.001
1444	07/22/86	0.017	0.001	0.001	0.001	0.016	0.001
1445	07/29/86	0.019	0.001	0.001	0.001	0.024	0.001
1446	08/05/86	0.023	0.001	0.001	0.001	0.020	0.001
1447	08/12/86	0.018	0.001	0.001	0.001	0.018	0.001
1448	08/19/86	0.023	0.001	0.001	0.001	0.024	0.001
1449	08/26/86	0.023	0.001	0.001	0.001	0.022	0.001
1450	09/02/86	0.018	0.001	0.001	0.001	0.020	0.001
1451	09/09/86	0.023	0.001	0.001	0.001	0.027	0.002

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Southern California Edison Company Environmental Monitoring Program Database Listings

Verified by: Mina Goesters, Ph.D. Date: 4/23/87

Table 2: Weekly Airborne Particulates Gross Beta Activity

Control Location: #3

Observation Number	Calendar Date	Location #1	Location #1 (2 sigma)	Location #2	Location #2 (2 sigma)	Location #3	Location #3 (2 sigma)	Location #4
1452	09/16/86	0.015	0.001	0.023	0.001	0.016	0.001	*
1453	09/23/86	0.015	0.001	0.017	0.001	0.017	0.001	*
1454	09/30/86	0.018	0.001	0.019	0.001	0.018	0.001	*
1455	10/07/86	0.021	0.001	0.026	0.001	0.021	0.001	*
1456	10/14/86	0.023	0.001	0.052	0.003	0.035	0.002	*
1457	10/21/86	0.036	0.002	0.041	0.002	0.055	0.003	*
1458	10/28/86	0.023	0.001	0.039	0.002	0.020	0.001	*
1459	11/04/86	0.025	0.001	0.035	0.002	0.041	0.002	*
1460	11/11/86	0.026	0.001	0.037	0.002	0.022	0.001	*
1461	11/18/86	0.023	0.001	0.027	0.002	0.035	0.002	*
1462	11/25/86	0.017	0.001	0.019	0.001	0.011	0.001	*
1463	12/02/86	0.020	0.001	0.028	0.001	0.029	0.002	*

Observation Number	Calendar Date	Location #4 (2 sigma)	Location #5	Location #5 (2 sigma)	Location #6	Location #6 (2 sigma)	Location #9	Location #10
1452	09/16/86	*	0.018	0.001	0.018	0.001	0.020	0.016
1453	09/23/86	*	0.018	0.001	0.017	0.001	0.013	0.015
1454	09/30/86	*	0.021	0.001	0.022	0.001	0.024	0.016
1455	10/07/86	*	0.027	0.001	0.021	0.001	0.020	0.022
1456	10/14/86	*	0.038	0.002	0.039	0.002	0.042	0.026
1457	10/21/86	*	0.050	0.002	0.046	0.002	0.030	0.035
1458	10/28/86	*	0.035	0.002	0.033	0.002	0.025	0.027
1459	11/04/86	*	0.046	0.002	0.037	0.002	0.039	0.027
1460	11/11/86	*	0.028	0.002	0.029	0.002	0.043	0.003
1461	11/18/86	*	0.030	0.002	0.033	0.002	0.020	0.018
1462	11/25/86	*	0.012	0.001	0.015	0.001	0.012	0.012
1463	12/02/86	*	0.024	0.001	0.021	0.001	0.022	0.021

Observation Number	Calendar Date	Location #11	Location #9 (2 sigma)	Location #10 (2 sigma)	Location #11 (2 sigma)	Location #12	Location #12 (2 sigma)
1452	09/16/86	0.028	0.001	0.001	0.001	0.026	0.001
1453	09/23/86	0.014	0.001	0.001	0.001	0.018	0.001
1454	09/30/86	0.020	0.001	0.001	0.001	0.023	0.001
1455	10/07/86	0.022	0.001	0.001	0.001	0.028	0.001
1456	10/14/86	0.037	0.002	0.001	0.002	0.046	0.002
1457	10/21/86	0.054	0.002	0.002	0.003	0.044	0.002
1458	10/28/86	0.056	0.001	0.001	0.003	0.048	0.002
1459	11/04/86	0.034	0.002	0.001	0.002	0.039	0.002
1460	11/11/86	0.044	0.002	0.001	0.002	0.034	0.002
1461	11/18/86	0.036	0.001	0.001	0.002	0.031	0.002
1462	11/25/86	0.023	0.001	0.001	0.001	0.026	0.001
1463	12/02/86	0.026	0.001	0.001	0.001	0.028	0.001

Southern California Edison Company Environmental Monitoring Program Database Listings

Verified by: Mina Goeters, Ph.D. Date: 4/22/87

Table 2: Weekly Airborne Particulates Gross Beta Activity

Control Location: #3

Observation Number	Calendar Date	Location #1	Location #1 (2 sigma)	Location #2	Location #2 (2 sigma)	Location #3	Location #3 (2 sigma)	Location #4
1464	12/09/86	0.026	0.001	0.033	0.002	0.040	0.002	*
1465	12/16/86	0.034	0.002	0.048	0.002	0.049	0.002	*
1466	12/23/86	0.041	0.002	0.039	0.002	0.028	0.001	*
1467	12/30/86	*	*	0.033	0.002	0.034	0.002	*

Observation Number	Calendar Date	Location #4 (2 sigma)	Location #5	Location #5 (2 sigma)	Location #6	Location #6 (2 sigma)	Location #9	Location #10
1464	12/09/86	*	0.012	0.001	0.029	0.001	0.045	0.019
1465	12/16/86	*	0.046	0.002	0.044	0.002	0.036	0.036
1466	12/23/86	*	0.034	0.002	0.035	0.002	0.032	0.030
1467	12/30/86	*	0.035	0.002	0.037	0.002	0.029	0.024

Observation Number	Calendar Date	Location #11	Location #9 (2 sigma)	Location #10 (2 sigma)	Location #11 (2 sigma)	Location #12	Location #12 (2 sigma)
1464	12/09/86	0.044	0.002	0.001	0.002	0.026	0.001
1465	12/16/86	0.044	0.002	0.002	0.002	0.044	0.002
1466	12/23/86	0.010	0.002	0.002	0.001	0.040	0.002
1467	12/30/86	0.032	0.002	0.001	0.002	0.032	0.002

N= 52

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Southern California Edison Company Environmental Monitoring Program Database Listings

Verified by: Mina Goeders, Ph.D. Date: 4/23/87

Table 3: Weekly Radioiodine I-131 Activity

Control Location: #3

Observation Number	Calendar Date	Location #1	Location #1 (2 sigma)	Location #2	Location #2 (2 sigma)	Location #3	Location #3 (2 sigma)	Location #4
580	01/07/86	0.00	0.04	0.00	0.04	0.00	0.04	0
581	01/14/86	0.00	0.04	0.00	0.04	0.00	0.04	0
582	01/21/86	0.00	0.04	0.00	0.04	0.00	0.04	0
583	01/28/86	0.00	0.04	0.00	0.04	0.00	0.08	0
584	02/04/86	0.00	0.04	0.00	0.04	0.00	0.04	0
585	02/11/86	0.00	0.04	0.00	0.04	0.00	0.04	0
586	02/18/86	0.00	0.04	0.00	0.04	0.00	0.04	0
587	02/25/86	0.00	0.04	0.00	0.04	0.00	0.04	0
588	03/04/86	0.00	0.04	0.00	0.04	0.00	0.04	0
589	03/11/86	0.00	0.04	0.00	0.04	0.00	0.04	0
590	03/18/86	0.00	0.04	0.00	0.04	0.00	0.04	0
591	03/25/86	0.00	0.04	0.00	0.04	0.00	0.04	0

Observation Number	Calendar Date	Location #4 (2 sigma)	Location #5	Location #5 (2 sigma)	Location #6	Location #6 (2 sigma)	Location #9	Location #10
580	01/07/86	0.04	0.00	0.04	0.00	0.04	0.00	0.00
581	01/14/86	0.04	0.00	0.04	0.00	0.04	0.00	0.00
582	01/21/86	0.04	0.00	0.04	0.00	0.04	0.00	0.00
583	01/28/86	0.04	0.00	0.06	0.00	0.05	0.00	0.00
584	02/04/86	0.04	0.00	0.04	0.00	0.04	0.00	0.00
585	02/11/86	0.04	0.00	0.04	0.00	0.04	0.00	0.00
586	02/18/86	0.04	0.00	0.04	0.00	0.04	0.00	0.00
587	02/25/86	0.04	0.00	0.04	0.00	0.04	0.00	0.00
588	03/04/86	0.04	0.00	0.04	0.00	0.04	0.00	0.00
589	03/11/86	0.04	0.00	0.04	0.00	0.04	0.00	0.00
590	03/18/86	0.04	0.00	0.04	0.00	0.04	0.00	0.00
591	03/25/86	0.04	0.00	0.04	0.00	0.04	0.07	0.00

Observation Number	Calendar Date	Location #11	Location #9 (2 sigma)	Location #10 (2 sigma)	Location #11 (2 sigma)	Location #12	Location #12 (2 sigma)
580	01/07/86	0.00	0.04	0.04	0.04	*	*
581	01/14/86	0.00	0.04	0.04	0.04	*	*
582	01/21/86	0.00	0.04	0.04	0.04	*	*
583	01/28/86	0.00	0.04	0.04	0.05	*	*
584	02/04/86	0.00	0.04	0.04	0.04	*	*
585	02/11/86	0.00	0.04	0.04	0.04	*	*
586	02/18/86	0.00	0.04	0.04	0.04	*	*
587	02/25/86	0.00	0.04	0.04	0.04	*	*
588	03/04/86	0.00	0.04	0.04	0.05	*	*
589	03/11/86	0.00	0.04	0.04	0.04	*	*
590	03/18/86	*	0.04	0.04	*	*	*
591	03/25/86	0.00	0.04	0.04	0.04	*	*

Southern California Edison Company Environmental Monitoring Program Database Listings

Verified by: Mina Goeckers, Ph.D. Date: 4/23/87

Table 3: Weekly Radioiodine I-131 Activity

Control Location: #3

Observation Number	Calendar Date	Location #1	Location #1 (2 sigma)	Location #2	Location #2 (2 sigma)	Location #3	Location #3 (2 sigma)	Location #4
592	04/01/86	0.00	0.04	0.00	0.04	0.00	0.04	*
593	04/08/86	0.00	0.04	0.00	0.04	0.00	0.04	*
594	04/15/86	0.00	0.04	0.00	0.04	0.00	0.04	*
595	04/22/86	0.00	0.04	0.00	0.04	0.00	0.04	*
596	04/29/86	0.00	0.04	0.00	0.04	0.00	0.04	0
597	05/06/86	0.00	0.04	0.00	0.04	0.00	0.04	*
598	05/13/86	0.91	0.04	0.15	0.04	0.74	0.04	*
599	05/20/86	0.41	0.04	1.03	0.05	0.62	0.04	*
600	05/27/86	0.11	0.04	0.39	0.04	0.27	0.04	*
601	06/03/86	0.08	0.04	0.09	0.04	0.12	0.04	*
602	06/10/86	0.00	0.04	0.00	0.04	0.00	0.04	*
603	06/17/86	0.00	0.04	0.00	0.04	0.00	0.04	*

Observation Number	Calendar Date	Location #4 (2 sigma)	Location #5	Location #5 (2 sigma)	Location #6	Location #6 (2 sigma)	Location #9	Location #10
592	04/01/86	*	0.00	0.04	0.00	0.04	0.00	0.00
593	04/08/86	*	0.00	0.04	0.00	0.04	0.00	*
594	04/15/86	*	0.00	0.04	0.00	0.04	0.00	*
595	04/22/86	*	0.00	0.04	0.00	0.04	0.00	0.00
596	04/29/86	0.06	0.00	0.04	0.00	0.04	0.00	0.00
597	05/06/86	*	0.00	0.04	0.00	0.04	0.00	0.00
598	05/13/86	*	0.34	0.04	0.51	0.04	0.19	0.07
599	05/20/86	*	1.49	0.07	0.61	0.04	0.34	0.35
600	05/27/86	*	0.13	0.04	0.30	0.04	0.12	0.44
601	06/03/86	*	0.06	0.04	0.00	0.04	0.10	0.12
602	06/10/86	*	0.00	0.04	0.00	0.04	0.00	0.00
603	06/17/86	*	0.00	0.04	0.00	0.30	0.00	0.00

Observation Number	Calendar Date	Location #11	Location #9 (2 sigma)	Location #10 (2 sigma)	Location #11 (2 sigma)	Location #12	Location #12 (2 sigma)
592	04/01/86	0.00	0.04	1.00	0.04	*	*
593	04/08/86	0.00	0.04	*	0.04	*	*
594	04/15/86	0.00	0.04	*	0.04	*	*
595	04/22/86	0.00	0.04	0.04	0.04	0.00	0.04
596	04/29/86	0.00	0.04	0.04	0.04	0.00	0.04
597	05/06/86	0.00	0.04	0.04	0.04	0.00	0.04
598	05/13/86	0.07	0.04	0.04	0.04	0.20	0.04
599	05/20/86	0.47	0.04	0.04	0.04	0.55	0.04
600	05/27/86	0.09	0.04	0.04	0.04	0.27	0.04
601	06/03/86	0.09	0.04	0.04	0.04	0.09	0.04
602	06/10/86	0.00	0.04	0.04	0.04	0.00	0.04
603	06/17/86	0.00	0.04	0.04	0.04	0.00	0.04

8:18 THURSDAY, APRIL 23, 1987

Southern California Edison Company Environmental Monitoring Program Database Listings

Verified by: Mina Goetter, PhD. Date: 4/23/87

Table 3: Weekly Radioiodine I-131 Activity

Control Location: #3

Observation Number	Calendar Date	Location #1	Location #1 (2 sigma)	Location #2	Location #2 (2 sigma)	Location #3	Location #3 (2 sigma)	Location #4
604	06/24/86	0	0.04	0	0.04	0	0.04	*
605	07/01/86	0	0.04	0	0.04	0	0.04	*
606	07/08/86	0	0.04	0	0.04	0	0.04	*
607	07/15/86	0	0.04	0	0.04	0	0.04	*
608	07/22/86	0	0.04	0	0.04	0	0.04	*
609	07/29/86	0	0.04	0	0.04	0	0.04	*
610	08/05/86	0	0.04	0	0.04	0	0.04	*
611	08/12/86	0	0.04	0	0.04	0	0.04	*
612	08/19/86	0	0.04	0	0.04	0	0.04	*
613	08/26/86	0	0.04	0	0.04	0	0.04	*
614	09/02/86	0	0.04	0	0.04	0	0.04	*
615	09/09/86	0	0.04	0	0.04	0	0.04	*

Observation Number	Calendar Date	Location #4 (2 sigma)	Location #5	Location #5 (2 sigma)	Location #6	Location #6 (2 sigma)	Location #9	Location #10
604	06/24/86	*	0	0.04	0	0.04	0	0
605	07/01/86	*	0	0.04	0	0.04	0	0
606	07/08/86	*	0	0.04	0	0.04	0	0
607	07/15/86	*	0	0.04	0	0.04	0	0
608	07/22/86	*	0	0.04	0	0.04	0	0
609	07/29/86	*	0	0.04	0	0.04	0	0
610	08/05/86	*	0	0.04	0	0.04	0	0
611	08/12/86	*	0	0.04	0	0.04	0	0
612	08/19/86	*	0	0.04	0	0.04	0	0
613	08/26/86	*	0	0.04	0	0.04	0	0
614	09/02/86	*	0	0.04	0	0.04	0	0
615	09/09/86	*	0	0.04	0	0.04	0	0

Observation Number	Calendar Date	Location #11	Location #9 (2 sigma)	Location #10 (2 sigma)	Location #11 (2 sigma)	Location #12	Location #12 (2 sigma)
604	06/24/86	0	0.04	0.04	0.04	0	0.04
605	07/01/86	0	0.04	0.04	0.04	0	0.04
606	07/08/86	0	0.04	0.04	0.04	0	0.04
607	07/15/86	0	0.04	0.04	0.04	0	0.04
608	07/22/86	0	0.04	0.04	0.04	0	0.04
609	07/29/86	0	0.04	0.04	0.04	0	0.04
610	08/05/86	0	0.04	0.04	0.04	0	0.04
611	08/12/86	0	0.04	0.04	0.04	0	0.04
612	08/19/86	0	0.04	0.04	0.04	0	0.04
613	08/26/86	0	0.04	0.04	0.04	0	0.04
614	09/02/86	0	0.04	0.04	0.04	0	0.04
615	09/09/86	0	0.04	0.04	0.04	0	0.04

Southern California Edison Company Environmental Monitoring Program Database Listings

Verified by: Mona Goeders, Ph.D. Date: 4/23/87

Table 3: Weekly Radioiodine I-131 Activity

Control Location: #3

Observation Number	Calendar Date	Location #1	Location #1 (2 sigma)	Location #2	Location #2 (2 sigma)	Location #3	Location #3 (2 sigma)	Location #4
616	09/16/86	0	0.04	0	0.04	0	0.04	*
617	09/23/86	0	0.04	0	0.04	0	0.04	*
618	09/30/86	0	0.04	0	0.04	0	0.04	*
619	10/07/86	0	0.04	0	0.04	0	0.04	*
620	10/14/86	0	0.04	0	0.04	0	0.04	*
621	10/21/86	0	0.04	0	0.04	0	0.08	*
622	10/28/86	0	0.04	0	0.04	0	0.04	*
623	11/04/86	0	0.04	0	0.04	0	0.04	*
624	11/11/86	0	0.04	0	0.04	0	0.04	*
625	11/18/86	0	0.04	0	0.04	0	0.04	*
626	11/25/86	0	0.04	0	0.04	0	0.04	*
627	12/02/86	0	0.04	0	0.04	0	0.04	*

Observation Number	Calendar Date	Location #4 (2 sigma)	Location #5	Location #5 (2 sigma)	Location #6	Location #6 (2 sigma)	Location #9	Location #10
616	09/16/86	*	0	0.04	0	0.04	0	0
617	09/23/86	*	0	0.04	0	0.04	0	0
618	09/30/86	*	0	0.04	0	0.04	0	0
619	10/07/86	*	0	0.04	0	0.04	0	0
620	10/14/86	*	0	0.04	0	0.04	0	0
621	10/21/86	*	0	0.04	0	0.04	0	0
622	10/28/86	*	0	0.04	0	0.04	0	0
623	11/04/86	*	0	0.05	0	0.04	0	0
624	11/11/86	*	0	0.05	0	0.04	0	0
625	11/18/86	*	0	0.04	0	0.04	0	0
626	11/25/86	*	0	0.04	0	0.04	0	0
627	12/02/86	*	0	0.04	0	0.04	0	0

Observation Number	Calendar Date	Location #11	Location #9 (2 sigma)	Location #10 (2 sigma)	Location #11 (2 sigma)	Location #12	Location #12 (2 sigma)
616	09/16/86	0	0.04	0.04	0.04	0	0.04
617	09/23/86	0	0.04	0.04	0.04	0	0.04
618	09/30/86	0	0.04	0.04	0.04	0	0.04
619	10/07/86	0	0.04	0.04	0.04	0	0.04
620	10/14/86	0	0.04	0.04	0.04	0	0.04
621	10/21/86	0	0.04	0.04	0.04	0	0.04
622	10/28/86	0	0.04	0.04	0.04	0	0.04
623	11/04/86	0	0.04	0.04	0.04	0	0.04
624	11/11/86	0	0.04	0.04	0.05	0	0.04
625	11/18/86	0	0.04	0.04	0.04	0	0.04
626	11/25/86	0	0.04	0.04	0.04	0	0.04
627	12/02/86	0	0.04	0.04	0.04	0	0.04

8:18 THURSDAY, APRIL 23, 1987

Southern California Edison Company Environmental Monitoring Program Database Listings

Verified by: Mina Gonzales, Ph.D. Date: 4/23/87

Table 3: Weekly Radioiodine I-131 Activity

Control Location: #3

Observation Number	Calendar Date	Location #1	Location #1 (2 sigma)	Location #2	Location #2 (2 sigma)	Location #3	Location #3 (2 sigma)	Location #4
628	12/09/86	0	0.04	0	0.04	0	0.04	*
629	12/16/86	0	0.04	0	0.04	0	0.04	*
630	12/23/86	0	0.04	0	0.04	0	0.04	*
631	12/30/86	*	*	0	0.04	0	0.06	*

Observation Number	Calendar Date	Location #4 (2 sigma)	Location #5	Location #5 (2 sigma)	Location #6	Location #6 (2 sigma)	Location #9	Location #10
628	12/09/86	*	0	0.04	0	0.04	0	0
629	12/16/86	*	0	0.04	0	0.04	0	0
630	12/23/86	*	0	0.04	0	0.04	0	0
631	12/30/86	*	0	0.04	0	0.04	0	0

Observation Number	Calendar Date	Location #11	Location #9 (2 sigma)	Location #10 (2 sigma)	Location #11 (2 sigma)	Location #12	Location #12 (2 sigma)
628	12/09/86	0	0.04	0.04	0.04	0	0.04
629	12/16/86	0	0.04	0.04	0.04	0	0.04
630	12/23/86	0	0.04	0.04	0.04	0	0.04
631	12/30/86	0	0.04	0.04	0.04	0	0.04

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Southern California Edison Company Environmental Monitoring Program Database Listings

Verified by: Mina Goeders, Ph.D. Date: 4/20/87

Table 4a: Quarterly Composite Airborne Particualtes Gamma Spectral Analysis

Control Location: #3

Observation Number	Calendar Date	Location	Be-7	Be-7 (2 sigma)	Zr(Nb)-95	Zr(Nb)-95 (2 sigma)	Cs-134	Cs-134 (2 sigma)	K-40	K-40 (2 sigma)	Ru-103	Ru-103 (2 sigma)	Cs-137
267	01/01/86	1	0.088	0.005	0	0.004	0.000	0.001	0	0.010	0.000	0.004	0.000
268	01/01/86	2	0.097	0.007	0	0.004	0.000	0.001	0	0.005	0.000	0.004	0.000
269	01/01/86	3	0.086	0.006	0	0.004	0.000	0.001	0	0.010	0.000	0.004	0.000
270	01/01/86	4	0.091	0.006	0	0.004	0.000	0.001	0	0.006	0.000	0.004	0.000
271	01/01/86	5	0.092	0.007	0	0.004	0.000	0.001	0	0.010	0.000	0.004	0.000
272	01/01/86	6	0.086	0.006	0	0.004	0.000	0.001	0	0.009	0.000	0.004	0.000
273	01/01/86	9	0.089	0.007	0	0.004	0.000	0.001	0	0.009	0.000	0.004	0.000
274	01/01/86	10	0.102	0.006	0	0.004	0.000	0.001	0	0.010	0.000	0.004	0.000
275	01/01/86	11	0.105	0.007	0	0.004	0.000	0.001	0	0.009	0.000	0.004	0.000
276	04/01/86	1	0.099	0.009	0	0.004	0.010	0.001	0	0.010	0.010	0.004	0.021
277	04/01/86	2	0.104	0.008	0	0.004	0.007	0.001	0	0.005	0.015	0.004	0.015
278	04/01/86	3	0.080	0.007	0	0.004	0.009	0.001	0	0.005	0.014	0.004	0.017
279	04/01/86	5	0.108	0.007	0	0.004	0.010	0.001	0	0.005	0.017	0.004	0.021
280	04/01/86	6	0.116	0.009	0	0.004	0.010	0.001	0	0.007	0.014	0.004	0.019
281	04/01/86	9	0.106	0.008	0	0.004	0.008	0.001	0	0.004	0.017	0.004	0.018
282	04/01/86	10	0.150	0.010	0	0.004	0.008	0.001	0	0.020	0.018	0.004	0.018
283	04/01/86	11	0.144	0.009	0	0.004	0.010	0.001	0	0.007	0.019	0.004	0.020
284	04/01/86	12	0.120	0.009	0	0.004	0.013	0.001	0	0.020	0.015	0.004	0.026
285	07/01/86	1	0.083	0.008	0	0.004	0.000	0.001	0	0.008	0.000	0.004	0.000
286	07/01/86	2	0.109	0.006	0	0.004	0.000	0.001	0	0.005	0.000	0.004	0.000

Observation Number	Calendar Date	Cs-137 (2 sigma)	Co-58	Co-58 (2 sigma)	Ag-110m	Ag-110m (2 sigma)	Ce-141	Ce-141 (2 sigma)	Co-60	Co-60 (2 sigma)	I-131	I-131 (2 sigma)	Ce-144	Ce-144 (2 sigma)
267	01/01/86	0.001	0	0.002	0	0.002	0	0.004	0	0.002	*	*	0	0.005
268	01/01/86	0.001	0	0.002	0	0.002	0	0.004	0	0.002	*	*	0	0.005
269	01/01/86	0.001	0	0.002	0	0.002	0	0.004	0	0.002	*	*	0	0.005
270	01/01/86	0.001	0	0.002	0	0.002	0	0.004	0	0.002	*	*	0	0.005
271	01/01/86	0.001	0	0.002	0	0.002	0	0.004	0	0.002	*	*	0	0.005
272	01/01/86	0.001	0	0.002	0	0.002	0	0.004	0	0.002	*	*	0	0.005
273	01/01/86	0.001	0	0.002	0	0.002	0	0.004	0	0.002	*	*	0	0.005
274	01/01/86	0.001	0	0.002	0	0.002	0	0.004	0	0.002	*	*	0	0.005
275	01/01/86	0.001	0	0.002	0	0.002	0	0.004	0	0.002	*	*	0	0.005
276	04/01/86	0.001	0	0.002	0	0.002	0	0.004	0	0.002	*	*	0	0.005
277	04/01/86	0.001	0	0.002	0	0.002	0	0.004	0	0.002	*	*	0	0.005
278	04/01/86	0.001	0	0.002	0	0.002	0	0.004	0	0.002	*	*	0	0.005
279	04/01/86	0.001	0	0.002	0	0.002	0	0.004	0	0.002	*	*	0	0.005
280	04/01/86	0.001	0	0.002	0	0.002	0	0.004	0	0.002	*	*	0	0.005
281	04/01/86	0.001	0	0.002	0	0.002	0	0.004	0	0.002	*	*	0	0.005
282	04/01/86	0.001	0	0.002	0	0.002	0	0.004	0	0.002	*	*	0	0.005
283	04/01/86	0.001	0	0.002	0	0.002	0	0.004	0	0.002	*	*	0	0.005
284	04/01/86	0.001	0	0.002	0	0.002	0	0.004	0	0.002	*	*	0	0.005
285	07/01/86	0.001	0	0.002	0	0.002	0	0.004	0	0.002	*	*	0	0.005
286	07/01/86	0.001	0	0.002	0	0.002	0	0.004	0	0.002	*	*	0	0.005

10:37 MONDAY, APRIL 20, 1987

Southern California Edison Company Environmental Monitoring Program Database Listings

Verified by: Mina Goodarzi, Ph.D. Date: 4/20/87

Table 4a: Quarterly Composite Airborne Particualtes Gamma Spectral Analysis

Control Location: 83

Observation Number	Calendar Date	Location	Be-7	Be-7 (2 sigma)	Zr(Nb)-95	Zr(Nb)-95 (2 sigma)	Cs-134	Cs-134 (2 sigma)	K-40	K-40 (2 sigma)	Ru-103	Ru-103 (2 sigma)	Cs-137
287	07/01/86	3	0.093	0.006	0	0.004	0	0.001	0	0.009	0	0.004	0
288	07/01/86	5	0.110	0.006	0	0.004	0	0.001	0	0.008	0	0.004	0
289	07/01/86	6	0.109	0.006	0	0.004	0	0.001	0	0.005	0	0.004	0
290	07/01/86	9	0.080	0.008	0	0.004	0	0.001	0	0.010	0	0.004	0
291	07/01/86	10	0.095	0.006	0	0.004	0	0.001	0	0.005	0	0.004	0
292	07/01/86	11	0.104	0.007	0	0.004	0	0.001	0	0.007	0	0.004	0
293	07/01/86	12	0.115	0.008	0	0.004	0	0.001	0	0.006	0	0.004	0
294	10/01/86	1	0.112	0.006	0	0.004	0	0.001	0	0.007	0	0.004	0
295	10/01/86	2	0.148	0.007	0	0.004	0	0.001	0	0.010	0	0.004	0
296	10/01/86	3	0.138	0.007	0	0.004	0	0.001	0	0.006	0	0.004	0
297	10/01/86	5	0.157	0.008	0	0.004	0	0.001	0	0.010	0	0.004	0
298	10/01/86	6	0.117	0.001	0	0.004	0	0.001	0	0.006	0	0.004	0
299	10/01/86	9	0.157	0.008	0	0.004	0	0.001	0	0.007	0	0.004	0
300	10/01/86	10	0.088	0.006	0	0.004	0	0.001	0	0.006	0	0.004	0
301	10/01/86	11	0.143	0.007	0	0.004	0	0.001	0	0.010	0	0.004	0
302	10/01/86	12	0.167	0.008	0	0.004	0	0.001	0	0.020	0	0.004	0

Observation Number	Calendar Date	Cs-137 (2 sigma)	Co-58	Co-58 (2 sigma)	Ag-110m	Ag-110m (2 sigma)	Ce-141	Ce-141 (2 sigma)	Co-60	Co-60 (2 sigma)	I-131	I-131 (2 sigma)	Ce-144	Ce-144 (2 sigma)
287	07/01/86	0.001	0	0.002	0	0.002	0	0.004	0	0.002	*	*	0	0.005
288	07/01/86	0.001	0	0.002	0	0.002	0	0.004	0	0.002	*	*	0	0.005
289	07/01/86	0.001	0	0.002	0	0.002	0	0.004	0	0.002	*	*	0	0.005
290	07/01/86	0.001	0	0.002	0	0.002	0	0.004	0	0.002	*	*	0	0.005
291	07/01/86	0.001	0	0.002	0	0.002	0	0.004	0	0.002	*	*	0	0.005
292	07/01/86	0.001	0	0.002	0	0.002	0	0.004	0	0.002	*	*	0	0.005
293	07/01/86	0.001	0	0.002	0	0.002	0	0.004	0	0.002	*	*	0	0.005
294	10/01/86	0.001	0	0.002	0	0.002	0	0.004	0	0.002	*	*	0	0.005
295	10/01/86	0.001	0	0.002	0	0.002	0	0.004	0	0.002	*	*	0	0.005
296	10/01/86	0.001	0	0.002	0	0.002	0	0.004	0	0.002	*	*	0	0.005
297	10/01/86	0.001	0	0.002	0	0.002	0	0.004	0	0.002	*	*	0	0.005
298	10/01/86	0.001	0	0.002	0	0.002	0	0.004	0	0.002	*	*	0	0.005
299	10/01/86	0.001	0	0.002	0	0.002	0	0.004	0	0.002	*	*	0	0.005
300	10/01/86	0.001	0	0.002	0	0.002	0	0.004	0	0.002	*	*	0	0.005
301	10/01/86	0.001	0	0.002	0	0.002	0	0.004	0	0.002	*	*	0	0.005
302	10/01/86	0.001	0	0.002	0	0.002	0	0.004	0	0.002	*	*	0	0.005

N= 36

Southern California Edison Company Environmental Monitoring Program Database Listings

Verified by: Mina Goeders, Ph.D. Date: 4/23/87

Table 4c: Quarterly Composite Airborne Particulates Gross Alpha and Strontium Activities

Control Location: 83

Observation Number	Calendar Date	Location 1 Sr-89	Location 1 Sr-89(2 sigma)	Location 1 Sr-90	Location 1 Sr-90(2 sigma)	Location 1 Gross Alpha	Location 1 Gross Alpha (2 sigma)	Location 2 Sr-89	Location 2 Sr-89(2 sigma)
67	01/01/86	*	*	0	0.001	0	0.001	*	*
68	04/01/86	*	*	0	0.001	0	0.001	*	*
69	07/01/86	*	*	0	0.001	0	0.001	*	*
70	10/01/86	*	*	0	0.001	0	0.001	*	*

Observation Number	Calendar Date	Location 2 Sr-90	Location 2 Sr-90(2 sigma)	Location 2 Gross Alpha	Location 2 Gross Alpha (2 sigma)	Location 3 Sr-89	Location 3 Sr-89(2 sigma)	Location 3 Sr-90	Location 3 Sr-90(2 sigma)
67	01/01/86	0	0.001	0	0.001	*	*	0	0.001
68	04/01/86	0	0.001	0	0.001	*	*	0	0.001
69	07/01/86	0	0.001	0	0.001	*	*	0	0.001
70	10/01/86	0	0.001	0	0.001	*	*	0	0.001

Observation Number	Calendar Date	Location 3 Gross Alpha	Location 3 Gross Alpha (2 sigma)	Location 4 Sr-89	Location 4 Sr-89(2 sigma)	Location 4 Sr-90	Location 4 Sr-90(2 sigma)	Location 4 Gross Alpha	Location 4 Gross Alpha (2 sigma)
67	01/01/86	0.000	0.001	*	*	0	0.001	0	0.001
68	04/01/86	0.000	0.001	*	*	*	*	*	*
69	07/01/86	0.002	0.001	*	*	*	*	*	*
70	10/01/86	0.000	0.001	*	*	*	*	*	*

Observation Number	Calendar Date	Location 5 Sr-89	Location 5 Sr-89(2 sigma)	Location 5 Sr-90	Location 5 Sr-90(2 sigma)	Location 5 Gross Alpha	Location 5 Gross Alpha (2 sigma)	Location 6 Sr-89	Location 6 Sr-89(2 sigma)
67	01/01/86	*	*	0	0.001	0.000	0.001	*	*
68	04/01/86	*	*	0	0.001	0.000	0.001	*	*
69	07/01/86	*	*	0	0.001	0.002	0.001	*	*
70	10/01/86	*	*	0	0.001	0.000	0.001	*	*

8:18 THURSDAY, APRIL 23, 1987

Southern California Edison Company Environmental Monitoring Program Database Listings

Verified by: Mina Sanders, Ph.D. Date: 4/23/87

Table 4c: Quarterly Composite Airborne Particulates Gross Alpha and Strontium Activities

Control Location: #3

Observation Number	Calendar Date	Location 6 Sr-90	Location 6 Sr-90(2 sigma)	Location 6 Gross Alpha	Location 6 Gross Alpha (2 sigma)	Location 9 Sr-89	Location 9 Sr-89(2 sigma)	Location 9 Sr-90	Location 9 Sr-90(2 sigma)
67	01/01/86	0	0.001	0.000	0.001	*	*	0	0.001
68	04/01/86	0	0.001	0.000	0.001	*	*	0	0.001
69	07/01/86	0	0.001	0.002	0.001	*	*	0	0.001
70	10/01/86	0	0.001	0.000	0.001	*	*	0	0.001

Observation Number	Calendar Date	Location 9 Gross Alpha	Location 9 Gross Alpha (2 sigma)	Location 10 Sr-89	Location 10 Sr-89(2 sigma)	Location 10 Sr-90	Location 10 Sr-90(2 sigma)	Location 10 Gross Alpha	Location 10 Gross Alpha (2 sigma)
67	01/01/86	0.000	0.001	*	*	0	0.001	0.000	0.001
68	04/01/86	0.000	0.001	*	*	0	0.001	0.000	0.001
69	07/01/86	0.002	0.001	*	*	0	0.001	0.002	0.001
70	10/01/86	0.000	0.001	*	*	0	0.001	0.000	0.001

Observation Number	Calendar Date	Location 11 Sr-89	Location 11 Sr-89(2 sigma)	Location 11 Sr-90	Location 11 Sr-90(2 sigma)	Location 11 Gross Alpha	Location 11 Gross Alpha (2 sigma)	Location 12 Sr-89
67	01/01/86	*	*	0	0.001	0.000	0.001	*
68	04/01/86	*	*	0	0.001	0.000	0.001	*
69	07/01/86	*	*	0	0.001	0.003	0.001	*
70	10/01/86	*	*	0	0.001	0.002	0.001	*

Observation Number	Calendar Date	Location 12 Sr-89(2 sigma)	Location 12 Sr-90	Location 12 Sr-90(2 sigma)	Location 12 Gross Alpha	Location 12 Gross Alpha (2 sigma)
67	01/01/86	*	*	*	*	*
68	04/01/86	*	0	0.001	0.000	0.001
69	07/01/86	*	0	0.001	0.003	0.001
70	10/01/86	*	0	0.001	0.002	0.001

N= 4

Southern California Edison Company Environmental Monitoring Program Database Listings

Verified by: Mina Sanders, Ph.D. Date: 4/20/87

Table 5: Monthly Ocean Water Gamma Spectral Analysis

Control Location: D

Observation Number	Calendar Date	Location	K-40	K-40 (2 sigma)	Zn-65	Zn-65 (2 sigma)	Cs-134	Cs-134 (2 sigma)	Mn-54	Mn-54 (2 sigma)	Zr(Nb)-95	Zr(Nb)-95 (2 sigma)	Cs-137	Cs-137 (2 sigma)
322	01/07/86	A	300	30	0	20	0	6	0	6	0	20	0	6
323	01/07/86	B	300	30	0	20	0	6	0	6	0	20	0	6
324	01/07/86	C	340	30	0	20	0	6	0	6	0	20	0	6
325	01/08/86	D	360	40	0	20	0	6	0	6	0	20	0	6
326	02/05/86	A	320	30	0	20	0	6	0	6	0	20	0	6
327	02/05/86	B	300	30	0	20	0	6	0	6	0	20	0	6
328	02/05/86	C	340	30	0	20	0	6	0	6	0	20	0	6
329	02/06/86	D	340	30	0	20	0	6	0	6	0	20	0	6
330	03/03/86	D	320	20	0	20	0	6	0	6	0	20	0	6
331	03/04/86	A	350	30	0	20	0	6	0	6	0	20	0	6
332	03/04/86	B	320	30	0	20	0	6	0	6	0	20	0	6
333	03/04/86	C	300	20	0	20	0	6	0	6	0	20	0	6

Observation Number	Calendar Date	Co-57	Co-57 (2 sigma)	Mo(Tc)-99	Mo(Tc)-99 (2 sigma)	Ce-141	Ce-141 (2 sigma)	Co-58	Co-58 (2 sigma)	Ru-103	Ru-103 (2 sigma)	Ce-144	Ce-144 (2 sigma)	Fe-59
322	01/07/86	0	6	0	3000	0	20	0	6	0	10	0	20	0
323	01/07/86	0	6	0	2000	0	20	0	6	0	10	0	20	0
324	01/07/86	0	6	0	4000	0	20	0	6	0	10	0	20	0
325	01/08/86	0	6	0	4000	0	20	0	6	0	10	0	20	0
326	02/05/86	0	6	0	2000	0	20	0	6	0	10	0	20	0
327	02/05/86	0	6	0	2000	0	20	0	6	0	10	0	20	0
328	02/05/86	0	6	0	2000	0	20	0	6	0	10	0	20	0
329	02/06/86	0	6	0	3000	0	20	0	6	0	10	0	20	0
330	03/03/86	0	6	0	2000	0	20	0	6	0	10	0	20	0
331	03/04/86	0	6	0	2000	0	20	0	6	0	10	0	20	0
332	03/04/86	0	6	0	4000	0	20	0	6	0	10	0	20	0
333	03/04/86	0	6	0	2000	0	20	0	6	0	10	0	20	0

Observation Number	Calendar Date	Fe-59 (2 sigma)	Ru-106	Ru-106 (2 sigma)	Ra-226	Ra-226 (2 sigma)	Co-60	Co-60 (2 sigma)	Ag-110m	Ag-110m (2 sigma)	Th-228	Th-228 (2 sigma)	I-131	I-131 (2 sigma)
322	01/07/86	20	0	40	0	20	0	6	0	10	0	20	*	*
323	01/07/86	20	0	30	0	20	0	6	0	10	0	20	*	*
324	01/07/86	20	0	30	0	20	0	6	0	10	0	20	*	*
325	01/08/86	20	0	30	0	20	0	6	0	10	0	20	*	*
326	02/05/86	20	0	30	0	20	0	6	0	10	0	20	*	*
327	02/05/86	20	0	30	0	20	0	6	0	10	0	20	*	*
328	02/05/86	20	0	30	0	20	0	6	0	10	0	20	*	*
329	02/06/86	20	0	30	0	20	0	6	0	10	0	20	*	*
330	03/03/86	20	0	30	0	20	0	6	0	10	0	20	*	*
331	03/04/86	20	0	30	0	20	0	6	0	10	0	20	*	*
332	03/04/86	20	0	30	0	20	0	6	0	10	0	20	*	*
333	03/04/86	20	0	30	0	20	0	6	0	10	0	20	*	*

10:37 MONDAY, APRIL 20, 1987

Southern California Edison Company Environmental Monitoring Program Database Listings

Verified by: Mina Goeders, Ph.D. Date: 4/20/87

Table 5: Monthly Ocean Water Gamma Spectral Analysis

Control Location: D

Observation Number	Calendar Date	Location	K-40	K-40 (2 sigma)	Zn-65	Zn-65 (2 sigma)	Cs-134	Cs-134 (2 sigma)	Mn-54	Mn-54 (2 sigma)	Zr(Nb)-95	Zr(Nb)-95 (2 sigma)	Cs-137	Cs-137 (2 sigma)
334	04/03/86	A	300	30	0	20	0	6	0	6	0	20	0	6
335	04/03/86	B	300	30	0	20	0	6	0	6	0	20	0	6
336	04/03/86	C	350	40	0	20	0	6	0	6	0	20	0	6
337	04/09/86	D	350	30	0	20	0	6	0	6	0	20	0	6
338	05/01/86	D	300	30	0	20	0	6	0	6	0	20	0	6
339	05/02/86	A	300	30	0	20	0	6	0	6	0	20	0	6
340	05/02/86	B	300	30	0	20	0	6	0	6	0	20	0	6
341	05/02/86	C	350	30	0	20	0	6	0	6	0	20	0	6
342	06/03/86	C	300	20	0	20	0	6	0	6	0	20	0	6
343	06/03/86	D	370	50	0	20	0	6	0	6	0	20	0	6
344	06/04/86	A	320	30	0	20	0	6	0	6	0	20	0	6
345	06/04/86	B	300	20	0	20	0	6	0	6	0	20	0	6

Observation Number	Calendar Date	Co-57	Co-57 (2 sigma)	Mo(Tc)-99	Mo(Tc)-99 (2 sigma)	Ce-141	Ce-141 (2 sigma)	Co-58	Co-58 (2 sigma)	Ru-103	Ru-103 (2 sigma)	Ce-144	Ce-144 (2 sigma)	Fe-59
334	04/03/86	0	6	0	2000	0	20	0	6	0	10	0	20	0
335	04/03/86	0	6	0	2000	0	20	0	6	0	10	0	20	0
336	04/03/86	0	6	0	2000	0	20	0	6	0	10	0	20	0
337	04/09/86	0	6	0	2000	0	20	0	6	0	10	0	20	0
338	05/01/86	0	6	0	2000	0	20	0	6	0	10	0	20	0
339	05/02/86	0	6	0	2000	0	20	0	6	0	10	0	20	0
340	05/02/86	0	6	0	2000	0	20	0	6	0	10	0	20	0
341	05/02/86	0	6	0	2000	0	20	0	6	0	10	0	20	0
342	06/03/86	0	6	0	30000	0	20	0	6	0	10	0	20	0
343	06/03/86	0	6	0	90000	0	20	0	6	0	10	0	20	0
344	06/04/86	0	6	0	20000	0	20	0	6	0	10	0	20	0
345	06/04/86	0	6	0	20000	0	20	0	6	0	10	0	20	0

Observation Number	Calendar Date	Fe-59 (2 sigma)	Ru-106	Ru-106 (2 sigma)	Ra-226	Ra-226 (2 sigma)	Co-60	Co-60 (2 sigma)	Ag-110m	Ag-110m (2 sigma)	Th-228	Th-228 (2 sigma)	I-131	I-131 (2 sigma)
334	04/03/86	20	0	30	0	20	0	6	0	10	0	20	*	*
335	04/03/86	20	0	30	0	20	0	6	0	10	0	20	*	*
336	04/03/86	20	0	30	0	20	0	6	0	10	0	20	*	*
337	04/09/86	20	0	30	0	20	0	6	0	10	0	20	*	*
338	05/01/86	20	0	30	0	20	0	6	0	10	0	20	*	*
339	05/02/86	20	0	30	0	20	0	6	0	10	0	20	*	*
340	05/02/86	20	0	30	0	20	0	6	0	10	0	20	*	*
341	05/02/86	20	0	30	0	20	0	6	0	10	0	20	*	*
342	06/03/86	20	0	30	0	20	0	6	0	10	0	20	*	*
343	06/03/86	20	0	30	0	20	0	6	0	10	0	20	*	*
344	06/04/86	20	0	30	0	20	0	6	0	10	0	20	*	*
345	06/04/86	20	0	30	0	20	0	6	0	10	0	20	*	*

Southern California Edison Company Environmental Monitoring Program Database Listings

Verified by: Mina Bowers, Ph.D. Date: 4/20/87

Table 5: Monthly Ocean Water Gamma Spectral Analysis

Control Location: D

Observation Number	Calendar Date	Location	K-40	K-40 (2 sigma)	Zn-65	Zn-65 (2 sigma)	Cs-134	Cs-134 (2 sigma)	Mn-54	Mn-54 (2 sigma)	Zr(Nb)-95	Zr(Nb)-95 (2 sigma)	Cs-137	Cs-137 (2 sigma)
346	07/01/86	A	300	30	0	20	0	6	0	6	0	20	0	6
347	07/01/86	B	340	30	0	20	0	6	0	6	0	20	0	6
348	07/01/86	C	300	30	0	20	0	6	0	6	0	20	0	6
349	07/01/86	D	300	30	0	20	0	6	0	6	0	20	0	6
350	08/05/86	A	310	30	0	20	0	6	0	6	0	20	0	6
351	08/05/86	B	320	30	0	20	0	6	0	6	0	20	0	6
352	08/05/86	C	330	30	0	20	0	6	0	6	0	20	0	6
353	08/08/86	D	330	30	0	20	0	6	0	6	0	20	0	6
354	09/04/86	A	290	40	0	20	0	6	0	6	0	20	0	6
355	09/04/86	B	340	30	0	20	0	6	0	6	0	20	0	6
356	09/04/86	C	350	40	0	20	0	6	0	6	0	20	0	6
357	09/09/86	D	300	30	0	20	0	6	0	6	0	20	0	6

Observation Number	Calendar Date	Co-57	Co-57 (2 sigma)	Mo(Tc)-99	Mo(Tc)-99 (2 sigma)	Ce-141	Ce-141 (2 sigma)	Co-58	Co-58 (2 sigma)	Ru-103	Ru-103 (2 sigma)	Ce-144	Ce-144 (2 sigma)	Fe-59
346	07/01/86	0	6	0	2000	0	20	0	6	0	10	0	20	0
347	07/01/86	0	6	0	2000	0	20	0	6	0	10	0	20	0
348	07/01/86	0	6	0	2000	0	20	0	6	0	10	0	20	0
349	07/01/86	0	6	0	2000	0	20	0	6	0	10	0	20	0
350	08/05/86	0	6	0	2000	0	20	0	6	0	10	0	20	0
351	08/05/86	0	6	0	2000	0	20	0	6	0	10	0	20	0
352	08/05/86	0	6	0	6000	0	20	0	6	0	10	0	20	0
353	08/08/86	0	6	0	10000	0	20	0	6	0	10	0	20	0
354	09/04/86	0	6	0	2000	0	20	0	6	0	10	0	20	0
355	09/04/86	0	6	0	2000	0	20	0	6	0	10	0	20	0
356	09/04/86	0	6	0	2000	0	20	0	6	0	10	0	20	0
357	09/09/86	0	6	0	2000	0	20	0	6	0	10	0	20	0

Observation Number	Calendar Date	Fe-59 (2 sigma)	Ru-106	Ru-106 (2 sigma)	Ra-226	Ra-226 (2 sigma)	Co-60	Co-60 (2 sigma)	Ag-110m	Ag-110m (2 sigma)	Th-228	Th-228 (2 sigma)	I-131	I-131 (2 sigma)
346	07/01/86	20	0	30	0	20	0	6	0	10	0	20	*	*
347	07/01/86	20	0	30	0	20	0	6	0	10	0	20	*	*
348	07/01/86	20	0	30	0	20	0	6	0	10	0	20	*	*
349	07/01/86	20	0	30	0	20	0	6	0	10	0	20	*	*
350	08/05/86	20	0	30	0	20	0	6	0	10	0	20	*	*
351	08/05/86	20	0	30	0	20	0	6	0	10	0	20	*	*
352	08/05/86	20	0	30	0	20	0	6	0	10	0	20	*	*
353	08/08/86	20	0	30	0	20	0	6	0	10	20	0	*	*
354	09/04/86	20	0	30	0	20	0	6	0	10	0	20	*	*
355	09/04/86	20	0	30	0	20	0	6	0	10	0	20	*	*
356	09/04/86	20	0	30	0	20	0	6	0	10	0	20	*	*
357	09/09/86	20	0	30	0	20	0	6	0	10	0	20	*	*

10:37 MONDAY, APRIL 20, 1987

Southern California Edison Company Environmental Monitoring Program Database Listings

Verified by: Mina Goeders, Ph.D. Date: 4/20/87

Table 5: Monthly Ocean Water Gamma Spectral Analysis

Control Location: D

Observation Number	Calendar Date	Location	K-40	K-40 (2 sigma)	Zn-65	Zn-65 (2 sigma)	Cs-134	Cs-134 (2 sigma)	Mn-54	Mn-54 (2 sigma)	Zr(Nb)-95	Zr(Nb)-95 (2 sigma)	Cs-137	Cs-137 (2 sigma)
358	10/02/86	D	300	30	0	20	0	6	0	6	0	20	0	6
359	10/06/86	A	300	30	0	20	0	6	0	6	0	20	0	6
360	10/06/86	B	300	30	0	20	0	6	0	6	0	20	0	6
361	10/06/86	C	300	30	0	20	0	6	0	6	0	20	0	6
362	11/03/86	A	350	30	0	20	0	6	0	6	0	20	0	6
363	11/03/86	B	320	30	0	20	0	6	0	6	0	20	0	6
364	11/03/86	C	320	30	0	20	0	6	0	6	0	20	0	6
365	11/03/86	D	290	30	0	20	0	6	0	6	0	20	0	6
366	12/02/86	D	320	30	0	20	0	6	0	6	0	20	0	6
367	12/03/86	A	290	30	0	20	0	6	0	6	0	20	0	6
368	12/03/86	B	310	30	0	20	0	6	0	6	0	20	0	6
369	12/03/86	C	310	30	0	20	0	6	0	6	0	20	0	6

Observation Number	Calendar Date	Co-57	Co-57 (2 sigma)	Mo(Tc)-99	Mo(Tc)-99 (2 sigma)	Ce-141	Ce-141 (2 sigma)	Co-58	Co-58 (2 sigma)	Ru-103	Ru-103 (2 sigma)	Ce-144	Ce-144 (2 sigma)	Fe-59
358	10/02/86	0	6	0	60000	0	20	0	6	0	10	0	20	0
359	10/06/86	0	6	0	2000	0	20	0	6	0	10	0	20	0
360	10/06/86	0	6	0	4000	0	20	0	6	0	10	0	20	0
361	10/06/86	0	6	0	3000	0	20	0	6	0	10	0	20	0
362	11/03/86	0	6	0	900000	0	20	0	6	0	10	0	20	0
363	11/03/86	0	6	0	700000	0	20	0	6	0	10	0	20	0
364	11/03/86	0	6	0	600000	0	20	0	6	0	10	0	20	0
365	11/03/86	0	6	0	700000	0	20	0	6	0	10	0	20	0
366	12/02/86	0	6	0	500000	0	20	0	6	0	10	0	20	0
367	12/03/86	0	6	0	500000	0	20	0	6	0	10	0	20	0
368	12/03/86	0	6	0	500000	0	20	0	6	0	10	0	20	0
369	12/03/86	0	6	0	500000	0	20	0	6	0	10	0	20	0

Observation Number	Calendar Date	Fe-59 (2 sigma)	Ru-106	Ru-106 (2 sigma)	Ra-226	Ra-226 (2 sigma)	Co-60	Co-60 (2 sigma)	Ag-110m	Ag-110m (2 sigma)	Th-228	Th-228 (2 sigma)	I-131	I-131 (2 sigma)
358	10/02/86	20	0	30	0	20	0	6	0	10	0	20	*	*
359	10/06/86	20	0	30	0	20	0	6	0	10	0	20	*	*
360	10/06/86	20	0	30	0	20	0	6	0	10	0	20	*	*
361	10/06/86	20	0	30	0	20	0	6	0	10	0	20	*	*
362	11/03/86	20	0	30	0	20	0	6	0	10	0	20	*	*
363	11/03/86	20	0	30	0	20	0	6	0	10	0	20	*	*
364	11/03/86	20	0	30	0	20	0	6	0	10	0	20	*	*
365	11/03/86	20	0	30	0	20	0	6	0	10	0	20	*	*
366	12/02/86	20	0	30	0	20	0	6	0	10	0	20	*	*
367	12/03/86	20	0	40	0	20	0	6	0	10	0	20	*	*
368	12/03/86	20	0	30	0	20	0	6	0	10	0	20	*	*
369	12/03/86	20	0	30	0	20	0	6	0	10	0	20	*	*

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Table 6: Bi-Monthly Ocean Water Gross Beta Activity

Control Location: #1

Observation Number	Calendar Date	Location #1	Location #1 (2 sigma)	Location #2	Location #2 (2 sigma)	Location #3	Location #3 (2 sigma)	Location #4	Location #4 (2 sigma)
70	01/07/86	900	100	600	100	500	100	700	100
71	03/04/86	1000	100	1000	100	900	100	1200	100
72	05/02/86	700	100	900	100	600	100	800	100
73	07/01/86	800	100	1000	100	800	100	900	100
74	09/04/86	800	100	800	100	800	100	900	100
75	11/03/86	900	100	700	100	900	100	800	100

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Table 7: Quarterly Composite Ocean Water Tritium Activity

Control Location: #1

Observation Number	Calendar Date	Location #1	Location #1 (2 sigma)	Location #2	Location #2 (2 sigma)	Location #3	Location #3 (2 sigma)	Location #4	Location #4 (2 sigma)
31	03/31/86	0	100	0	100	0	100	0	100
32	06/30/86	0	100	0	100	0	100	0	100
33	09/30/86	0	100	2200	100	0	100	0	100
34	12/31/86	0	100	0	100	0	100	0	100

N= 4

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Verified by: Mina Goeters, Ph.D. Date: 4/20/87

Table 9a: Monthly Drinking Water Analysis

Control Location: 83

Observation Number	Calendar Date	Location	Be-7	Be-7 (2 sigma)	Zr(Nb)-95	Zr(Nb)-95 (2 sigma)	Cs-134	Cs-134 (2 sigma)	K-40	K-40 (2 sigma)
133	01/09/86	1	0	30	0	20	0	6	0	20
134	01/09/86	2	0	40	0	20	0	6	0	60
135	01/09/86	3	0	30	0	20	0	6	0	30
136	02/06/86	1	0	50	0	20	0	6	0	30
137	02/06/86	2	0	50	0	20	0	6	0	50
138	02/06/86	3	0	50	0	20	0	6	0	70
139	03/06/86	1	0	50	0	20	0	6	0	40
140	03/06/86	2	0	50	0	20	0	6	0	30
141	03/06/86	3	0	50	0	20	0	6	0	60
142	04/10/86	1	0	30	0	20	0	6	0	60
143	04/10/86	2	0	20	0	20	0	6	0	30
144	04/10/86	3	0	20	0	20	0	6	0	20

Observation Number	Calendar Date	Ru-103	Ru-103 (2 sigma)	Cs-137	Cs-137 (2 sigma)	Co-58	Co-58 (2 sigma)	Ag-110m	Ag-110m (2 sigma)	Ce-141
133	01/09/86	0	20	0	6	0	6	0	10	0
134	01/09/86	0	20	0	6	0	6	0	10	0
135	01/09/86	0	20	0	6	0	6	0	10	0
136	02/06/86	0	20	0	6	0	6	0	10	0
137	02/06/86	0	20	0	6	0	6	0	10	0
138	02/06/86	0	20	0	6	0	6	0	10	0
139	03/06/86	0	20	0	6	0	6	0	10	0
140	03/06/86	0	20	0	6	0	6	0	10	0
141	03/06/86	0	20	0	6	0	6	0	10	0
142	04/10/86	0	20	0	6	0	6	0	10	0
143	04/10/86	0	20	0	6	0	6	0	10	0
144	04/10/86	0	20	0	6	0	6	0	10	0

Observation Number	Calendar Date	Ce-141 (2 sigma)	Co-60	Co-60 (2 sigma)	I-131	I-131 (2 sigma)	Ce-144	Ce-144 (2 sigma)	H-3	H-3 (2 sigma)
133	01/09/86	20	0	6	0	2	0	20	0	100
134	01/09/86	20	0	6	0	2	0	20	0	100
135	01/09/86	20	0	6	0	2	0	20	0	100
136	02/06/86	20	0	6	0	2	0	20	0	100
137	02/06/86	20	0	6	0	2	0	20	0	100
138	02/06/86	20	0	6	0	2	0	20	0	100
139	03/06/86	20	0	6	0	2	0	20	0	100
140	03/06/86	20	0	6	0	2	0	20	0	100
141	03/06/86	20	0	6	0	2	0	20	0	100
142	04/10/86	20	0	6	0	2	0	20	0	100
143	04/10/86	20	0	6	0	2	0	20	0	100
144	04/10/86	20	0	6	0	2	0	20	0	100

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Table 9a: Monthly Drinking Water Analysis

Control Location: #3

Observation Number	Calendar Date	Location	Be-7	Be-7 (2 sigma)	Zr(Nb)-95	Zr(Nb)-95 (2 sigma)	Cs-134	Cs-134 (2 sigma)	K-40	K-40 (2 sigma)
145	05/09/86	1	0	30	0	20	0	6	0	30
146	05/09/86	2	0	50	0	20	0	6	0	80
147	05/09/86	3	0	30	0	20	0	6	0	50
148	06/04/86	1	0	50	0	20	0	6	0	50
149	06/04/86	2	0	50	0	20	0	6	0	60
150	06/04/86	3	0	50	0	20	0	6	0	50
151	07/10/86	1	0	30	0	20	0	6	0	80
152	07/10/86	2	0	30	0	20	0	6	0	20
153	07/10/86	3	0	20	0	20	0	6	0	60
154	08/08/86	1	0	50	0	20	0	6	0	90
155	08/08/86	2	0	50	0	20	0	6	0	40
156	08/08/86	3	0	50	0	20	0	60	0	60

Observation Number	Calendar Date	Ru-103	Ru-103 (2 sigma)	Cs-137	Cs-137 (2 sigma)	Co-58	Co-58 (2 sigma)	Ag-110m	Ag-110m (2 sigma)	Ce-141
145	05/09/86	0	20	0	6	0	6	0	10	0
146	05/09/86	0	20	0	6	0	6	0	10	0
147	05/09/86	0	20	0	6	0	6	0	10	0
148	06/04/86	0	20	0	6	0	6	0	10	0
149	06/04/86	0	20	0	6	0	6	0	10	0
150	06/04/86	0	20	0	6	0	6	0	10	0
151	07/10/86	0	20	0	6	0	6	0	10	0
152	07/10/86	0	20	0	6	0	6	0	10	0
153	07/10/86	0	20	0	6	0	6	0	10	0
154	08/08/86	0	20	0	6	0	6	0	10	0
155	08/08/86	0	20	0	6	0	6	0	10	0
156	08/08/86	0	20	0	6	0	6	0	10	0

Observation Number	Calendar Date	Ce-141 (2 sigma)	Co-60	Co-60 (2 sigma)	I-131	I-131 (2 sigma)	Ce-144	Ce-144 (2 sigma)	H-3	H-3 (2 sigma)
145	05/09/86	20	0	6	0	2	0	20	0	100
146	05/09/86	20	0	6	0	2	0	20	0	100
147	05/09/86	20	0	6	0	2	0	20	0	100
148	06/04/86	20	0	6	0	2	0	20	0	100
149	06/04/86	20	0	6	0	2	0	20	0	100
150	06/04/86	20	0	6	0	2	0	20	0	100
151	07/10/86	20	0	6	0	2	0	20	0	100
152	07/10/86	20	0	6	0	2	0	20	0	100
153	07/10/86	20	0	6	0	2	0	20	0	100
154	08/08/86	20	0	6	0	2	0	20	0	100
[redacted]	08/08/86	20	0	6	0	2	0	20	0	100
[redacted]	08/08/86	20	0	6	0	2	0	20	0	100

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Table 9a: Monthly Drinking Water Analysis

Control Location: #3

Observation Number	Calendar Date	Location	Be-7	Be-7 (2 sigma)	Zr(Nb)-95	Zr(Nb)-95 (2 sigma)	Cs-134	Cs-134 (2 sigma)	K-40	K-40 (2 sigma)
157	09/10/86	1	0	30	0	20	0	6	0	50
158	09/10/86	2	0	30	0	20	0	6	0	30
159	09/10/86	3	0	30	0	20	0	6	0	70
160	10/09/86	1	0	30	0	20	0	6	0	30
161	10/09/86	2	0	30	0	20	0	6	0	60
162	10/09/86	3	0	20	0	20	0	6	0	30
163	11/06/86	1	0	50	0	20	0	6	0	20
164	11/06/86	2	0	50	0	20	0	6	0	70
165	11/06/86	3	0	50	0	20	0	6	0	40
166	12/08/86	1	0	40	0	20	0	6	0	40
167	12/08/86	2	0	40	0	20	0	6	0	40
168	12/08/86	3	0	40	0	20	0	6	0	70

Observation Number	Calendar Date	Ru-103	Ru-103 (2 sigma)	Cs-137	Cs-137 (2 sigma)	Co-58	Co-58 (2 sigma)	Ag-110m	Ag-110m (2 sigma)	Ce-141
157	09/10/86	0	20	0	6	0	6	0	10	0
158	09/10/86	0	20	0	6	0	6	0	10	0
159	09/10/86	0	20	0	6	0	6	0	10	0
160	10/09/86	0	20	0	6	0	6	0	10	0
161	10/09/86	0	20	0	6	0	6	0	10	0
162	10/09/86	0	20	0	6	0	6	0	10	0
163	11/06/86	0	20	0	6	0	6	0	10	0
164	11/06/86	0	20	0	6	0	6	0	10	0
165	11/06/86	0	20	0	6	0	6	0	10	0
166	12/08/86	0	20	0	6	0	6	0	10	0
167	12/08/86	0	20	0	6	0	6	0	10	0
168	12/08/86	0	20	0	6	0	6	0	10	0

Observation Number	Calendar Date	Ce-141 (2 sigma)	Co-60	Co-60 (2 sigma)	I-131	I-131 (2 sigma)	Ce-144	Ce-144 (2 sigma)	H-3	H-3 (2 sigma)
157	09/10/86	20	0	6	0	2	0	20	0	100
158	09/10/86	20	0	6	0	2	0	20	0	100
159	09/10/86	20	0	6	0	2	0	20	0	100
160	10/09/86	20	0	6	0	2	0	20	0	100
161	10/09/86	20	0	6	0	2	0	20	0	100
162	10/09/86	20	0	6	0	2	0	20	0	100
163	11/06/86	20	0	6	0	2	0	20	0	100
164	11/06/86	20	0	6	0	2	0	20	0	100
165	11/06/86	20	0	6	0	2	0	20	0	100
166	12/08/86	20	0	6	0	2	0	20	0	100
167	12/08/86	20	0	6	0	2	0	20	0	100
168	12/08/86	20	0	6	0	2	0	20	0	100

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Table 9b: Monthly Drinking Water Solids Gross Alpha and Gross Beta Activities

Control Location: #3

Observation Number	Calendar Date	Location 3 Gross Alpha	Location 3 Gross Alpha (2 sigma)	Location 3 Gross Beta	Location 3 Gross Beta (2 sigma)	Location 1 Gross Alpha	Location 1 Gross Alpha (2 sigma)
139	01/09/86	0.2	0.1	0.0	0.1	0	0.1
140	02/06/86	0.0	0.1	0.4	0.1	0	0.1
141	03/06/86	0.0	0.1	0.0	0.1	0	0.1
142	04/10/86	0.0	0.1	0.3	0.1	0	0.1
143	05/09/86	0.0	0.1	0.0	0.1	0	0.1
144	06/04/86	0.0	0.1	0.2	0.1	0	0.1
145	07/10/86	0.0	0.1	0.2	0.1	0	0.1
146	08/08/86	0.0	0.1	0.3	0.1	0	0.1
147	09/10/86	0.0	0.1	0.0	0.1	0	0.1
148	10/09/86	0.0	0.1	0.0	0.1	0	0.1
149	11/06/86	0.0	0.1	0.3	0.1	0	0.1
150	12/08/86	0.0	0.1	0.0	0.1	0	0.1

Observation Number	Calendar Date	Location 1 Gross Beta	Location 1 Gross Beta (2 sigma)	Location 2 Gross Alpha	Location 2 Gross Alpha (2 sigma)	Location 2 Gross Beta	Location 2 Gross Beta (2 sigma)
139	01/09/86	0.8	0.1	0.0	0.1	0.0	0.1
140	02/06/86	0.8	0.1	2.0	0.4	9.8	0.5
141	03/06/86	0.0	0.1	0.6	0.1	1.7	0.2
142	04/10/86	0.4	0.1	0.0	0.1	0.4	0.1
143	05/09/86	0.4	0.1	2.8	0.4	12.4	0.8
144	06/04/86	0.4	0.1	1.0	0.2	3.1	0.2
145	07/10/86	0.3	0.1	3.3	0.5	28.0	1.0
146	08/08/86	1.0	0.1	1.2	0.2	1.1	0.2
147	09/10/86	0.5	0.1	0.8	0.1	4.0	0.3
148	10/09/86	0.6	0.1	0.5	0.2	1.9	0.2
149	11/06/86	0.4	0.1	0.5	0.1	1.8	0.2
150	12/08/86	0.3	0.1	0.8	0.2	2.4	0.2

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Table 9c: Monthly Drinking Water Filtrate Gross Alpha and Gross Beta Activities

Control Location: #3

Observation Number	Calendar Date	Location 3 Gross Alpha	Location 3 Gross Alpha (2 sigma)	Location 3 Gross Beta	Location 3 Gross Beta (2 sigma)	Location 1 Gross Alpha	Location 1 Gross Alpha (2 sigma)
143	01/09/86	0	2	13	1	0	4
144	02/06/86	0	4	6	1	0	2
145	03/06/86	0	4	8	1	0	4
146	04/10/86	0	2	8	1	0	2
147	05/09/86	0	2	7	1	0	1
148	06/04/86	0	4	10	1	0	4
149	07/10/86	0	4	9	1	0	3
150	08/08/86	0	4	6	1	0	5
151	09/10/86	0	2	7	1	0	2
152	10/09/86	0	4	7	1	0	4
153	11/06/86	0	4	7	1	0	4
154	12/08/86	0	4	8	1	0	3

Observation Number	Calendar Date	Location 1 Gross Beta	Location 1 Gross Beta (2 sigma)	Location 2 Gross Alpha	Location 2 Gross Alpha (2 sigma)	Location 2 Gross Beta	Location 2 Gross Beta (2 sigma)
143	01/09/86	14	1	0	5	15	1
144	02/06/86	9	1	0	5	14	1
145	03/06/86	14	1	0	6	20	1
146	04/10/86	12	1	0	3	16	1
147	05/09/86	12	1	0	7	24	1
148	06/04/86	13	1	6	4	17	1
149	07/10/86	10	1	10	7	18	1
150	08/08/86	16	1	0	4	14	1
151	09/10/86	11	1	0	4	15	1
152	10/09/86	8	1	0	4	16	1
153	11/06/86	6	1	0	4	13	1
154	12/08/86	11	1	0	4	14	1

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Table 9d: Quarterly Composite Drinking Water Solids Gross Alpha and Gross Beta Activities

Control Location: #3

Observation Number	Calendar Date	Location 3 Gross Alpha	Location 3 Gross Alpha (2 sigma)	Location 3 Gross Beta	Location 3 Gross Beta (2 sigma)	Location 1 Gross Alpha	Location 1 Gross Alpha (2 sigma)
101	01/01/86	0	0.1	0.0	0.1	0	0.1
102	04/01/86	0	0.1	0.0	0.1	0	0.1
103	07/01/86	0	0.1	0.3	0.1	0	0.1
104	10/01/86	0	0.1	0.0	0.1	0	0.1

Observation Number	Calendar Date	Location 1 Gross Beta	Location 1 Gross Beta (2 sigma)	Location 2 Gross Alpha	Location 2 Gross Alpha (2 sigma)	Location 2 Gross Beta	Location 2 Gross Beta (2 sigma)
101	01/01/86	0.6	0.1	1.2	0.2	6.7	0.4
102	04/01/86	0.4	0.1	1.2	0.2	4.6	0.3
103	07/01/86	0.7	0.1	1.1	0.3	10.1	0.7
104	10/01/86	0.5	0.1	0.7	0.1	2.7	0.3

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Table 9e: Quarterly Composite Drinking Water Filtrate Analysis

Control Location: #3

Observation Number	Calendar Date	Location	Be-7	Be-7 (2 sigma)	Zr(Nb)-95	Zr(Nb)-95 (2 sigma)	Cs-134	Cs-134 (2 sigma)	K-40	K-40 (2 sigma)	Ru-103	Ru-103 (2 sigma)
214	03/31/86	1	*	*	*	*	*	*	*	*	*	*
215	03/31/86	2	*	*	*	*	*	*	*	*	*	*
216	03/31/86	3	*	*	*	*	*	*	*	*	*	*
217	06/30/86	1	*	*	*	*	*	*	*	*	*	*
218	06/30/86	2	*	*	*	*	*	*	*	*	*	*
219	06/30/86	3	*	*	*	*	*	*	*	*	*	*
220	09/30/86	1	*	*	*	*	*	*	*	*	*	*
221	09/30/86	2	*	*	*	*	*	*	*	*	*	*
222	09/30/86	3	*	*	*	*	*	*	*	*	*	*
223	12/31/86	1	*	*	*	*	*	*	*	*	*	*
224	12/31/86	2	*	*	*	*	*	*	*	*	*	*
225	12/31/86	3	*	*	*	*	*	*	*	*	*	*

Observation Number	Calendar Date	Cs-137	Cs-137 (2 sigma)	Co-58	Co-58 (2 sigma)	Ag-110m	Ag-110m (2 sigma)	Ce-141	Ce-141 (2 sigma)	Co-60	Co-60 (2 sigma)	I-131
214	03/31/86	*	*	*	*	*	*	*	*	*	*	*
215	03/31/86	*	*	*	*	*	*	*	*	*	*	*
216	03/31/86	*	*	*	*	*	*	*	*	*	*	*
217	06/30/86	*	*	*	*	*	*	*	*	*	*	*
218	06/30/86	*	*	*	*	*	*	*	*	*	*	*
219	06/30/86	*	*	*	*	*	*	*	*	*	*	*
220	09/30/86	*	*	*	*	*	*	*	*	*	*	*
221	09/30/86	*	*	*	*	*	*	*	*	*	*	*
222	09/30/86	*	*	*	*	*	*	*	*	*	*	*
223	12/31/86	*	*	*	*	*	*	*	*	*	*	*
224	12/31/86	*	*	*	*	*	*	*	*	*	*	*
225	12/31/86	*	*	*	*	*	*	*	*	*	*	*

Observation Number	Calendar Date	I-131 (2 sigma)	Ce-144	Ce-144 (2 sigma)	Gross Alpha	Gross Alpha (2 sigma)	Gross Beta	Gross Beta (2 sigma)	H-3	H-3 (2 sigma)
214	03/31/86	*	*	*	0	2	10	1	0	100
215	03/31/86	*	*	*	0	5	20	1	0	100
216	03/31/86	*	*	*	0	4	7	1	0	100
217	06/30/86	*	*	*	0	4	9	1	0	100
218	06/30/86	*	*	*	7	4	18	1	0	100
219	06/30/86	*	*	*	0	4	12	1	0	100
220	09/30/86	*	*	*	0	4	13	1	0	100
221	09/30/86	*	*	*	0	4	17	2	0	100
222	09/30/86	*	*	*	0	4	8	1	0	100
223	12/31/86	*	*	*	0	4	8	1	0	100
224	12/31/86	*	*	*	0	4	16	1	0	100
225	12/31/86	*	*	*	0	4	10	1	0	100

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Table 10: Semi-Annual Shoreline Sediment Gamma Spectral Analysis

Control Location: #4

Observation Number	Calendar Date	Location	K-40	K-40 (2 sigma)	Zn-65	Zn-65 (2 sigma)	Cs-134	Cs-134 (2 sigma)	Mn-54	Mn-54 (2 sigma)	Zr(Nb)-95	Zr(Nb)-95 (2 sigma)	Cs-137	Cs-137 (2 sigma)
96	04/11/86	1	12.9	0.6	0	0.2	0	0.03	0	0.05	0	0.1	0	0.02
97	04/11/86	2	13.2	0.7	0	0.2	0	0.03	0	0.05	0	0.1	0	0.03
98	04/11/86	3	15.4	0.8	0	0.2	0	0.03	0	0.05	0	0.1	0	0.02
99	04/11/86	4	17.8	0.8	0	0.2	0	0.03	0	0.05	0	0.1	0	0.02
100	09/17/86	1	14.3	0.7	0	0.2	0	0.03	0	0.05	0	0.1	0	0.02
101	09/17/86	2	16.6	0.8	0	0.2	0	0.03	0	0.05	0	0.1	0	0.03
102	09/17/86	3	12.9	0.6	0	0.2	0	0.03	0	0.05	0	0.1	0	0.02
103	09/17/86	4	17.5	0.9	0	0.2	0	0.03	0	0.05	0	0.1	0	0.02

Observation Number	Calendar Date	Co-57	Co-57 (2 sigma)	Mo(Tc)-99	Mo(Tc)-99 (2 sigma)	Ce-141	Ce-141 (2 sigma)	Co-58	Co-58 (2 sigma)	Ru-103	Ru-103 (2 sigma)	Ce-144	Ce-144 (2 sigma)	Fe-59
96	04/11/86	0	0.05	0	10	0	0.1	0	0.05	0	0.1	0	0.2	0
97	04/11/86	0	0.05	0	10	0	0.1	0	0.05	0	0.1	0	0.2	0
98	04/11/86	0	0.05	0	5	0	0.1	0	0.05	0	0.1	0	0.2	0
99	04/11/86	0	0.05	0	20	0	0.1	0	0.05	0	0.1	0	0.2	0
100	09/17/86	0	0.05	0	5	0	0.1	0	0.05	0	0.1	0	0.2	0
101	09/17/86	0	0.05	0	5	0	0.1	0	0.05	0	0.1	0	0.2	0
102	09/17/86	0	0.05	0	5	0	0.1	0	0.05	0	0.1	0	0.2	0
103	09/17/86	0	0.05	0	5	0	0.1	0	0.05	0	0.1	0	0.2	0

Observation Number	Calendar Date	Fe-59 (2 sigma)	Ru-106	Ru-106 (2 sigma)	Ra-226	Ra-226 (2 sigma)	Co-60	Co-60 (2 sigma)	Ag-110m	Ag-110m (2 sigma)	Th-228	Th-228 (2 sigma)	I-131	I-131 (2 sigma)
96	04/11/86	0.2	0	0.3	0.17	0.05	0	0.05	0	0.1	0.14	0.05	0	0.5
97	04/11/86	0.2	0	0.3	0.37	0.05	0	0.05	0	0.1	0.39	0.05	0	0.5
98	04/11/86	0.2	0	0.3	0.14	0.05	0	0.05	0	0.1	0.12	0.05	0	0.5
99	04/11/86	0.2	0	0.3	0.37	0.05	0	0.05	0	0.1	0.99	0.05	0	0.5
100	09/17/86	0.2	0	0.3	0.19	0.05	0	0.05	0	0.1	0.20	0.05	0	0.5
101	09/17/86	0.2	0	0.3	0.12	0.05	0	0.05	0	0.1	0.14	0.05	0	0.5
102	09/17/86	0.2	0	0.3	0.15	0.05	0	0.05	0	0.1	0.14	0.05	0	0.5
103	09/17/86	0.2	0	0.3	0.24	0.05	0	0.05	0	0.1	0.45	0.05	0	0.5

N= 8

Southern California Edison Company Environmental Monitoring Program Database Listings

Verified by: Mina Gaukers, Ph.D. Date: 4/20/87

Table 11: Semi-Annual Ocean Bottom Sediment Gamma Spectral Analysis

Control Location: E

Observation Number	Calendar Date	Location	K-40	K-40 (2 sigma)	Zn-65	Zn-65 (2 sigma)	Cs-134	Cs-134 (2 sigma)	Mn-54	Mn-54 (2 sigma)	Zr(Nb)-95	Zr(Nb)-95 (2 sigma)	Cs-137	Cs-137 (2 sigma)
104	05/12/86	A	10.6	0.5	0	0.2	0	0.04	0	0.04	0	0.08	0	0.04
105	05/12/86	B	13.8	0.7	0	0.2	0	0.04	0	0.04	0	0.09	0	0.04
106	05/12/86	C	15.2	0.7	0	0.2	0	0.04	0	0.04	0	0.09	0	0.04
107	05/15/86	E	13.2	0.6	0	0.2	0	0.04	0	0.04	0	0.08	0	0.04
108	05/21/86	D	15.2	0.7	0	0.2	0	0.04	0	0.04	0	0.09	0	0.04
109	11/05/86	C	12.4	0.6	0	0.2	0	0.04	0	0.04	0	0.08	0	0.04
110	11/05/86	D	10.6	0.6	0	0.2	0	0.04	0	0.04	0	0.08	0	0.04
111	11/06/86	E	14.6	0.7	0	0.2	0	0.04	0	0.04	0	0.08	0	0.04
112	11/07/86	A	11.1	0.5	0	0.2	0	0.04	0	0.04	0	0.08	0	0.04
113	11/07/86	B	12.5	0.6	0	0.2	0	0.04	0	0.04	0	0.09	0	0.04

Observation Number	Calendar Date	Co-57	Co-57 (2 sigma)	Mo(Tc)-99	Mo(Tc)-99 (2 sigma)	Ce-141	Ce-141 (2 sigma)	Co-58	Co-58 (2 sigma)	Ru-103	Ru-103 (2 sigma)	Ce-144	Ce-144 (2 sigma)	Fe-59
104	05/12/86	0	0.04	0	60000	0	0.08	0	0.04	0	0.08	0	0.2	0
105	05/12/86	0	0.04	0	40000	0	0.09	0	0.04	0	0.09	0	0.2	0
106	05/12/86	0	0.04	0	90000	0	0.09	0	0.04	0	0.09	0	0.2	0
107	05/15/86	0	0.04	0	30000	0	0.08	0	0.04	0	0.08	0	0.2	0
108	05/21/86	0	0.04	0	9000	0	0.09	0	0.04	0	0.09	0	0.2	0
109	11/05/86	0	0.04	0	6000	0	0.08	0	0.04	0	0.08	0	0.2	0
110	11/05/86	0	0.04	0	20000	0	0.08	0	0.04	0	0.08	0	0.2	0
111	11/06/86	0	0.04	0	8000	0	0.08	0	0.04	0	0.08	0	0.2	0
112	11/07/86	0	0.04	0	6000	0	0.08	0	0.04	0	0.08	0	0.2	0
113	11/07/86	0	0.04	0	2000	0	0.09	0	0.04	0	0.09	0	0.2	0

Observation Number	Calendar Date	Fe-59 (2 sigma)	Ru-106	Ru-106 (2 sigma)	Ra-226	Ra-226 (2 sigma)	Co-60	Co-60 (2 sigma)	Ag-110m	Ag-110m (2 sigma)	Th-228	Th-228 (2 sigma)	I-131	I-131 (2 sigma)
104	05/12/86	0.2	0	0.2	0.56	0.04	0.06	0.04	0	0.08	0.64	0.04	0	2.0
105	05/12/86	0.2	0	0.3	0.24	0.04	0.00	0.04	0	0.09	0.28	0.04	0	2.0
106	05/12/86	0.2	0	0.3	0.16	0.04	0.00	0.04	0	0.09	0.12	0.04	0	3.0
107	05/15/86	0.2	0	0.2	0.22	0.04	0.00	0.04	0	0.08	0.42	0.04	0	2.0
108	05/21/86	0.2	0	0.3	0.21	0.04	0.00	0.04	0	0.09	0.24	0.04	0	0.9
109	11/05/86	0.2	0	0.2	0.29	0.04	0.00	0.04	0	0.08	0.40	0.04	0	0.8
110	11/05/86	0.2	0	0.2	0.50	0.04	0.00	0.04	0	0.08	0.57	0.04	0	2.0
111	11/06/86	0.2	0	0.2	0.25	0.04	0.00	0.04	0	0.08	0.49	0.04	0	0.8
112	11/07/86	0.2	0	0.2	0.54	0.04	0.00	0.04	0	0.08	0.70	0.04	0	2.0
113	11/07/86	0.2	0	0.3	0.25	0.04	0.00	0.04	0	0.09	0.25	0.04	0	0.9

N= 10

10:37 MONDAY, APRIL 20, 1987

Southern California Edison Company Environmental Monitoring Program Database Listings

Verified by: Mina Booters, Ph.D. Date: 4/20/87

Table 12a: Quarterly Non-Migratory Marine Animals Analysis (Flesh type)

Control Location: C

Observation Number	Calendar Date	Sample Type	Location	K-40	K-40 (2 sigma)	Zn-65	Zn-65 (2 sigma)	Cs-134	Cs-134 (2 sigma)	Mn-54	Mn-54 (2 sigma)	Zr(Nb)-95
508	02/28/86	sheephead	C	3.00	0.20	0	0.06	0	0.006	0	0.010	0
509	02/28/86	black perch	C	2.00	0.10	0	0.05	0	0.005	0	0.010	0
510	02/28/86	spiny lobster	C	2.50	0.20	0	0.05	0	0.005	0	0.010	0
511	02/28/86	keyhole limpet	C	1.02	0.05	0	0.04	0	0.004	0	0.007	0
512	03/04/86	sheephead	A	2.10	0.10	0	0.06	0	0.006	0	0.010	0
513	03/04/86	black perch	A	2.70	0.10	0	0.06	0	0.006	0	0.010	0
514	03/04/86	sheephead	B	3.20	0.10	0	0.06	0	0.006	0	0.010	0
515	03/04/86	black perch	B	2.80	0.20	0	0.08	0	0.008	0	0.020	0

Observation Number	Calendar Date	Zr(Nb)-95 (2 sigma)	Cs-137	Cs-137 (2 sigma)	Co-57	Co-57 (2 sigma)	Mo(Tc)-99	Mo(Tc)-99 (2 sigma)	Ce-141	Ce-141 (2 sigma)	Co-58	Co-58 (2 sigma)
508	02/28/86	0.030	0.0053	0.0002	0	0.010	0	3	0	0.06	0.0000	0.009
509	02/28/86	0.030	0.0073	0.0003	0	0.010	0	5	0	0.05	0.0000	0.010
510	02/28/86	0.020	0.0040	0.0002	0	0.010	0	5	0	0.05	0.0000	0.010
511	02/28/86	0.020	0.0000	0.0040	0	0.007	0	4	0	0.04	0.0000	0.007
512	03/04/86	0.030	0.0220	0.0010	0	0.010	0	6	0	0.06	0.0150	0.002
513	03/04/86	0.030	0.0090	0.0003	0	0.010	0	6	0	0.06	0.0000	0.010
514	03/04/86	0.030	0.0089	0.0003	0	0.010	0	6	0	0.06	0.0000	0.010
515	03/04/86	0.040	0.0000	0.0080	0	0.020	0	8	0	0.08	0.0000	0.020

Observation Number	Calendar Date	Ru-103	Ru-103 (2 sigma)	Ce-144	Ce-144 (2 sigma)	Fe-59	Fe-59 (2 sigma)	Ru-106	Ru-106 (2 sigma)	Ra-226	Ra-226 (2 sigma)	Co-60	Co-60 (2 sigma)
508	02/28/86	0	0.009	0	0.06	0	0.06	0	0.03	0.000	0.020	0.0000	0.0090
509	02/28/86	0	0.008	0	0.05	0	0.05	0	0.05	0.000	0.020	0.0000	0.0050
510	02/28/86	0	0.008	0	0.05	0	0.05	0	0.05	0.000	0.020	0.0000	0.0100
511	02/28/86	0	0.005	0	0.04	0	0.04	0	0.04	0.000	0.010	0.0021	0.0009
512	03/04/86	0	0.008	0	0.06	0	0.06	0	0.06	0.000	0.020	0.0270	0.0020
513	03/04/86	0	0.006	0	0.06	0	0.06	0	0.06	0.000	0.020	0.0043	0.0009
514	03/04/86	0	0.009	0	0.06	0	0.06	0	0.06	0.000	0.020	0.0000	0.0100
515	03/04/86	0	0.010	0	0.08	0	0.08	0	0.08	0.000	0.030	0.0000	0.0100

Observation Number	Calendar Date	Ag-110m	Ag-110m (2 sigma)	Th-228	Th-228 (2 sigma)	I-131	I-131 (2 sigma)	Bound H-3	Bound H-3 (2 sigma)	Aqueous H-3	Aqueous H-3 (2 sigma)
508	02/28/86	0.0000	0.0060	0.000	0.020	0	0.20	0	0.6	0	0.020
509	02/28/86	0.0000	0.0050	0.000	0.020	0	0.10	0	0.5	0	0.020
510	02/28/86	0.0000	0.0080	0.000	0.020	0	0.10	0	0.5	0	0.020
511	02/28/86	0.0071	0.0007	0.000	0.020	0	0.09	0	0.4	0	0.020
512	03/04/86	0.0000	0.0060	0.000	0.020	0	0.10	0	0.6	0	0.020
513	03/04/86	0.0000	0.0060	0.000	0.020	0	0.10	0	0.9	0	0.020
514	03/04/86	0.0000	0.0090	0.000	0.020	0	0.10	0	0.6	0	0.020
515	03/04/86	0.0000	0.0080	0.000	0.030	0	0.20	0	0.1	0	0.030

Southern California Edison Company Environmental Monitoring Program Database Listings

Verified by: Mina Sanders, Ph.D. Date: 4/20/87

Table 12a: Quarterly Non-Migratory Marine Animals Analysis (Flesh type)

Control Location: C

Observation Number	Calendar Date	Sample Type	Location	K-40	K-40 (2 sigma)	Zn-65	Zn-65 (2 sigma)	Cs-134	Cs-134 (2 sigma)	Mn-54	Mn-54 (2 sigma)	Zr(Nb)-95
516	03/04/86	bay mussel	B	0.70	0.08	0	0.03	0	0.007	0	0.007	0
517	03/05/86	spiny lobster	A	2.90	0.10	0	0.07	0	0.007	0	0.010	0
518	03/05/86	bay mussel	A	0.67	0.06	0	0.03	0	0.005	0	0.006	0
519	03/07/86	spiny lobster	B	3.30	0.20	0	0.06	0	0.006	0	0.010	0
520	05/12/86	bay mussel	B	0.75	0.07	0	0.03	0	0.003	0	0.007	0
521	05/15/86	sheephead	C	2.60	0.10	0	0.05	0	0.005	0	0.010	0
522	05/15/86	black perch	C	2.20	0.10	0	0.05	0	0.005	0	0.010	0
523	05/15/86	keyhole limpet	C	0.89	0.04	0	0.03	0	0.003	0	0.006	0

Observation Number	Calendar Date	Zr(Nb)-95 (2 sigma)	Cs-137	Cs-137 (2 sigma)	Co-57	Co-57 (2 sigma)	Mo(Tc)-99	Mo(Tc)-99 (2 sigma)	Ce-141	Ce-141 (2 sigma)	Co-58	Co-58 (2 sigma)
516	03/04/86	0.010	0.0000	0.0060	0	0.006	0	3	0	0.03	0.0000	0.010
517	03/05/86	0.040	0.0051	0.0004	0	0.010	0	7	0	0.07	0.0000	0.010
518	03/05/86	0.020	0.0016	0.0002	0	0.006	0	3	0	0.03	0.0090	0.002
519	03/07/86	0.030	0.0120	0.0060	0	0.010	0	6	0	0.06	0.0000	0.010
520	05/12/86	0.020	0.0000	0.0030	0	0.007	0	500	0	0.03	0.0100	0.003
521	05/15/86	0.030	0.0043	0.0003	0	0.010	0	100	0	0.05	0.0000	0.008
522	05/15/86	0.020	0.0045	0.0002	0	0.010	0	100	0	0.05	0.0000	0.010
523	05/15/86	0.010	0.0000	0.0030	0	0.006	0	70	0	0.03	0.0000	0.006

Observation Number	Calendar Date	Ru-103	Ru-103 (2 sigma)	Ce-144	Ce-144 (2 sigma)	Fe-59	Fe-59 (2 sigma)	Ru-106	Ru-106 (2 sigma)	Ra-226	Ra-226 (2 sigma)	Co-60	Co-60 (2 sigma)
516	03/04/86	0	0.007	0	0.03	0	0.03	0	0.06	0.000	0.010	0.007	0.0030
517	03/05/86	0	0.010	0	0.07	0	0.07	0	0.07	0.000	0.030	0.014	0.0020
518	03/05/86	0	0.006	0	0.03	0	0.03	0	0.03	0.000	0.010	0.011	0.0010
519	03/07/86	0	0.009	0	0.06	0	0.06	0	0.06	0.000	0.020	0.006	0.0010
520	05/12/86	0	0.008	0	0.03	0	0.03	0	0.03	0.000	0.010	0.010	0.0020
521	05/15/86	0	0.008	0	0.05	0	0.05	0	0.03	0.000	0.020	0.000	0.0080
522	05/15/86	0	0.007	0	0.05	0	0.05	0	0.05	0.000	0.020	0.000	0.0050
523	05/15/86	0	0.004	0	0.03	0	0.03	0	0.03	0.000	0.010	0.000	0.0020

Observation Number	Calendar Date	Ag-110m	Ag-110m (2 sigma)	Th-228	Th-228 (2 sigma)	I-131	I-131 (2 sigma)	Bound H-3	Bound H-3 (2 sigma)	Aqueous H-3	Aqueous H-3 (2 sigma)
516	03/04/86	0.0000	0.0070	0.000	0.010	0	0.07	0	0.3	0	0.010
517	03/05/86	0.0080	0.0030	0.000	0.030	0	0.20	0	1.0	0	0.030
518	03/05/86	0.0000	0.0060	0.000	0.010	0	0.08	0	0.3	0	0.010
519	03/07/86	0.0180	0.0020	0.000	0.020	0	0.10	0	0.6	0	0.020
520	05/12/86	0.0000	0.0070	0.000	0.010	0	0.30	0	0.3	0	0.008
521	05/15/86	0.0000	0.0050	0.000	0.020	0	0.10	0	0.5	0	0.010
522	05/15/86	0.0000	0.0050	0.000	0.020	0	0.10	0	0.5	0	0.010
523	05/15/86	0.0000	0.0060	0.000	0.010	0	0.07	0	0.3	0	0.009

10:37 MONDAY, APRIL 20, 1987

Southern California Edison Company Environmental Monitoring Program Database Listings

Verified by: Mina Steeter, Ph.D. Date: 4/20/87

Table 12a: Quarterly Non-Migratory Marine Animals Analysis (Flesh type)

Control Location: C

Observation Number	Calendar Date	Sample Type	Location	K-40	K-40 (2 sigma)	Zn-65	Zn-65 (2 sigma)	Cs-134	Cs-134 (2 sigma)	Mn-54	Mn-54 (2 sigma)	Zr(Nb)-95
524	05/16/86	spiny lobster	A	2.40	0.10	0	0.05	0	0.005	0	0.010	0
525	05/16/86	spiny lobster	B	2.90	0.10	0	0.05	0	0.005	0	0.010	0
526	05/16/86	spiny lobster	C	2.90	0.10	0	0.05	0	0.005	0	0.010	0
527	05/20/86	sheephead	B	2.70	0.10	0	0.05	0	0.005	0	0.010	0
528	05/21/86	sheephead	A	2.50	0.10	0	0.05	0	0.005	0	0.010	0
529	05/21/86	black perch	A	2.30	0.10	0	0.05	0	0.005	0	0.010	0
530	05/21/86	black perch	B	1.80	0.10	0	0.05	0	0.005	0	0.010	0
531	05/25/86	sea hare	A	0.84	0.04	0	0.02	0	0.004	0	0.004	0

Observation Number	Calendar Date	Zr(Nb)-95 (2 sigma)	Cs-137	Cs-137 (2 sigma)	Co-57	Co-57 (2 sigma)	Mo(Tc)-99	Mo(Tc)-99 (2 sigma)	Ce-141	Ce-141 (2 sigma)	Co-58	Co-58 (2 sigma)
524	05/16/86	0.020	0.0042	0.0002	0	0.010	0	100	0	0.05	0.0000	0.007
525	05/16/86	0.020	0.0042	0.0002	0	0.010	0	100	0	0.05	0.0000	0.010
526	05/16/86	0.020	0.0034	0.0002	0	0.010	0	100	0	0.05	0.0000	0.010
527	05/20/86	0.030	0.0104	0.0005	0	0.010	0	20	0	0.05	0.0000	0.010
528	05/21/86	0.030	0.0350	0.0020	0	0.010	0	10	0	0.05	0.0150	0.002
529	05/21/86	0.020	0.0090	0.0005	0	0.010	0	10	0	0.05	0.0090	0.002
530	05/21/86	0.020	0.0056	0.0002	0	0.010	0	5	0	0.05	0.0000	0.010
531	05/25/86	0.009	0.0000	0.0040	0	0.004	0	8	0	0.02	0.0180	0.002

Observation Number	Calendar Date	Ru-103	Ru-103 (2 sigma)	Ce-144	Ce-144 (2 sigma)	Fe-59	Fe-59 (2 sigma)	Ru-106	Ru-106 (2 sigma)	Ra-226	Ra-226 (2 sigma)	Co-60	Co-60 (2 sigma)
524	05/16/86	0	0.007	0	0.05	0	0.05	0	0.05	0.000	0.020	0.008	0.0020
525	05/16/86	0	0.010	0	0.05	0	0.05	0	0.05	0.000	0.020	0.010	0.0020
526	05/16/86	0	0.007	0	0.05	0	0.05	0	0.05	0.000	0.020	0.000	0.0100
527	05/20/86	0	0.008	0	0.05	0	0.05	0	0.05	0.000	0.020	0.000	0.0030
528	05/21/86	0	0.008	0	0.05	0	0.05	0	0.05	0.000	0.020	0.046	0.0020
529	05/21/86	0	0.005	0	0.05	0	0.05	0	0.05	0.000	0.020	0.012	0.0010
530	05/21/86	0	0.008	0	0.05	0	0.05	0	0.05	0.000	0.020	0.000	0.0080
531	05/25/86	0	0.005	0	0.02	0	0.02	0	0.03	0.000	0.009	0.041	0.0020

Observation Number	Calendar Date	Ag-110m	Ag-110m (2 sigma)	Th-228	Th-228 (2 sigma)	I-131	I-131 (2 sigma)	Bound H-3	Bound H-3 (2 sigma)	Aqueous H-3	Aqueous H-3 (2 sigma)
524	05/16/86	0.0084	0.0009	0.000	0.020	0	0.20	0	0.5	0	0.010
525	05/16/86	0.0130	0.0020	0.000	0.020	0	0.20	0	0.5	0	0.010
526	05/16/86	0.0000	0.0070	0.000	0.020	0	0.10	0	0.5	0	0.010
527	05/20/86	0.0000	0.0080	0.000	0.020	0	0.10	0	0.5	0	0.010
528	05/21/86	0.0000	0.0050	0.000	0.020	0	0.10	0	0.5	0	0.020
529	05/21/86	0.0000	0.0050	0.000	0.020	0	0.10	0	0.5	0	0.010
530	05/21/86	0.0000	0.0050	0.000	0.020	0	0.10	0	0.5	0	0.010
531	05/25/86	0.0000	0.0040	0.000	0.030	0	0.05	0	0.2	0	0.004

Southern California Edison Company Environmental Monitoring Program Database Listings

Verified by: Mina Bootsteyn, Ph.D. Date: 4/29/87

Table 12a: Quarterly Non-Migratory Marine Animals Analysis (Flesh type)

Control Location: C

Observation Number	Calendar Date	Sample Type	Location	K-40	K-40 (2 sigma)	Zn-65	Zn-65 (2 sigma)	Cs-134	Cs-134 (2 sigma)	Mn-54	Mn-54 (2 sigma)	Zr(Nb)-95
532	08/05/86	sheephead	B	2.80	0.20	0	0.05	0	0.005	0	0.010	0
533	08/05/86	black perch	B	2.40	0.10	0	0.06	0	0.006	0	0.010	0
534	08/06/86	sheephead	A	2.70	0.10	0	0.05	0	0.005	0	0.010	0
535	08/06/86	black perch	A	2.50	0.10	0	0.06	0	0.006	0	0.010	0
536	08/06/86	spiny lobster	A	1.90	0.10	0	0.05	0	0.005	0	0.010	0
537	08/06/86	bay mussel	B	0.75	0.08	0	0.03	0	0.006	0	0.008	0
538	08/07/86	sheephead	C	2.30	0.10	0	0.05	0	0.005	0	0.010	0
539	08/07/86	black perch	C	2.50	0.10	0	0.06	0	0.006	0	0.010	0

Observation Number	Calendar Date	Zr(Nb)-95 (2 sigma)	Cs-137	Cs-137 (2 sigma)	Co-57	Co-57 (2 sigma)	Mo(Tc)-99	Mo(Tc)-99 (2 sigma)	Ce-141	Ce-141 (2 sigma)	Co-58	Co-58 (2 sigma)
532	08/05/86	0.02	0.0050	0.0020	0	0.010	0	5	0	0.05	0.0000	0.010
533	08/05/86	0.03	0.0057	0.0008	0	0.010	0	6	0	0.06	0.0000	0.010
534	08/06/86	0.03	0.0050	0.0003	0	0.010	0	5	0	0.05	0.0000	0.010
535	08/06/86	0.03	0.0051	0.0006	0	0.010	0	6	0	0.06	0.0000	0.010
536	08/06/86	0.02	0.0040	0.0010	0	0.010	0	5	0	0.05	0.0000	0.007
537	08/06/86	0.02	0.0000	0.0080	0	0.006	0	3	0	0.03	0.0000	0.020
538	08/07/86	0.02	0.0041	0.0002	0	0.010	0	5	0	0.05	0.0000	0.008
539	08/07/86	0.03	0.0029	0.0003	0	0.010	0	6	0	0.06	0.0000	0.010

Observation Number	Calendar Date	Ru-103	Ru-103 (2 sigma)	Ce-144	Ce-144 (2 sigma)	Fe-59	Fe-59 (2 sigma)	Ru-106	Ru-106 (2 sigma)	Ra-226	Ra-226 (2 sigma)	Co-60	Co-60 (2 sigma)
532	08/05/86	0	0.008	0	0.05	0	0.05	0	0.05	0.000	0.020	0.000	0.0100
533	08/05/86	0	0.008	0	0.06	0	0.06	0	0.06	0.000	0.020	0.000	0.0080
534	08/06/86	0	0.008	0	0.05	0	0.05	0	0.05	0.000	0.020	0.000	0.0100
535	08/06/86	0	0.006	0	0.06	0	0.06	0	0.06	0.000	0.020	0.008	0.0030
536	08/06/86	0	0.007	0	0.05	0	0.05	0	0.05	0.000	0.020	0.017	0.0010
537	08/06/86	0	0.010	0	0.03	0	0.03	0	0.06	0.000	0.010	0.019	0.0050
538	08/07/86	0	0.005	0	0.05	0	0.05	0	0.02	0.000	0.020	0.000	0.0080
539	08/07/86	0	0.006	0	0.06	0	0.06	0	0.06	0.000	0.020	0.000	0.0060

Observation Number	Calendar Date	Ag-110m	Ag-110m (2 sigma)	Th-228	Th-228 (2 sigma)	I-131	I-131 (2 sigma)	Bound H-3	Bound H-3 (2 sigma)	Aqueous H-3	Aqueous H-3 (2 sigma)
532	08/05/86	0.0000	0.0080	0.000	0.020	0	0.10	0	0.5	0	0.020
533	08/05/86	0.0000	0.0080	0.000	0.020	0	0.10	0	0.6	0	0.020
534	08/06/86	0.0000	0.0050	0.000	0.020	0	0.10	0	0.5	0	0.020
535	08/06/86	0.0000	0.0060	0.000	0.020	0	0.10	0	0.6	0	0.020
536	08/06/86	0.0070	0.0020	0.000	0.020	0	0.10	0	0.7	0	0.010
537	08/06/86	0.0000	0.0080	0.000	0.010	0	0.08	0	0.3	0	0.010
538	08/07/86	0.0000	0.0050	0.000	0.020	0	0.10	0	0.5	0	0.020
539	08/07/86	0.0000	0.0060	0.000	0.020	0	0.10	0	0.6	0	0.020

10:37 MONDAY, APRIL 20, 1987

Southern California Edison Company Environmental Monitoring Program Database Listings

Verified by: Mina Goeters, Ph.D. Date: 4/20/87

Table 12a: Quarterly Non-Migratory Marine Animals Analysis (Flesh type)

Control Location: C

Observation Number	Calendar Date	Sample Type	Location	K-40	K-40 (2 sigma)	Zn-65	Zn-65 (2 sigma)	Cs-134	Cs-134 (2 sigma)	Mn-54	Mn-54 (2 sigma)	Zr(Nb)-95
540	08/07/86	keyhole limpet	C	0.68	0.03	0	0.02	0	0.003	0	0.005	0
541	08/08/86	spiny lobster	C	2.90	0.20	0	0.04	0	0.004	0	0.008	0
542	08/13/86	spiny lobster	B	1.90	0.10	0	0.04	0	0.006	0	0.009	0
543	08/19/86	sea hare	A	0.94	0.04	0	0.02	0	0.004	0	0.005	0
544	11/03/86	sheephead	A	3.20	0.20	0	0.05	0	0.005	0	0.010	0
545	11/03/86	sheephead	B	2.90	0.10	0	0.05	0	0.005	0	0.010	0
546	11/03/86	black perch	B	2.40	0.10	0	0.06	0	0.006	0	0.010	0
547	11/03/86	spiny lobster	B	2.50	0.10	0	0.05	0	0.005	0	0.009	0

Observation Number	Calendar Date	Zr(Nb)-95 (2 sigma)	Cs-137	Cs-137 (2 sigma)	Co-57	Co-57 (2 sigma)	Mo(Tc)-99	Mo(Tc)-99 (2 sigma)	Ce-141	Ce-141 (2 sigma)	Co-58	Co-58 (2 sigma)
540	08/07/86	0.01	0.0000	0.0050	0	0.005	0	2	0	0.02	0.0000	0.005
541	08/08/86	0.02	0.0027	0.0002	0	0.008	0	4	0	0.04	0.0000	0.008
542	08/13/86	0.02	0.0037	0.0002	0	0.009	0	4	0	0.04	0.0000	0.009
543	08/19/86	0.01	0.0000	0.0050	0	0.004	0	2	0	0.02	0.0046	0.003
544	11/03/86	0.03	0.0050	0.0003	0	0.010	0	5	0	0.05	0.0000	0.010
545	11/03/86	0.02	0.0070	0.0020	0	0.010	0	5	0	0.05	0.0000	0.010
546	11/03/86	0.03	0.0056	0.0003	0	0.010	0	10	0	0.06	0.0000	0.010
547	11/03/86	0.02	0.0047	0.0005	0	0.009	0	20	0	0.05	0.0000	0.009

Observation Number	Calendar Date	Ru-103	Ru-103 (2 sigma)	Ce-144	Ce-144 (2 sigma)	Fe-59	Fe-59 (2 sigma)	Ru-106	Ru-106 (2 sigma)	Ra-226	Ra-226 (2 sigma)	Co-60	Co-60 (2 sigma)
540	08/07/86	0	0.005	0	0.02	0	0.02	0	0.02	0.000	0.009	0.002	0.0006
541	08/08/86	0	0.008	0	0.04	0	0.04	0	0.04	0.000	0.020	0.000	0.0080
542	08/13/86	0	0.009	0	0.04	0	0.04	0	0.04	0.000	0.020	0.009	0.0020
543	08/19/86	0	0.005	0	0.02	0	0.02	0	0.04	0.005	0.001	0.084	0.0050
544	11/03/86	0	0.008	0	0.05	0	0.05	0	0.05	0.000	0.020	0.000	0.0100
545	11/03/86	0	0.005	0	0.05	0	0.05	0	0.05	0.000	0.020	0.000	0.0100
546	11/03/86	0	0.006	0	0.06	0	0.06	0	0.06	0.000	0.020	0.000	0.0060
547	11/03/86	0	0.007	0	0.05	0	0.05	0	0.05	0.000	0.020	0.002	0.0010

Observation Number	Calendar Date	Ag-110m	Ag-110m (2 sigma)	Th-228	Th-228 (2 sigma)	I-131	I-131 (2 sigma)	Bound H-3	Bound H-3 (2 sigma)	Aqueous H-3	Aqueous H-3 (2 sigma)
540	08/07/86	0.0000	0.0050	0.000	0.009	0	0.06	0	0.2	0	0.008
541	08/08/86	0.0000	0.0060	0.000	0.020	0	0.10	0	0.6	0	0.010
542	08/13/86	0.0150	0.0010	0.000	0.020	0	0.10	0	0.4	0	0.010
543	08/19/86	0.0000	0.0040	0.038	0.002	0	0.05	0	0.2	0	0.005
544	11/03/86	0.0000	0.0050	0.000	0.020	0	0.10	0	0.5	0	0.020
545	11/03/86	0.0140	0.0050	0.000	0.020	0	0.10	0	0.5	0	0.020
546	11/03/86	0.0000	0.0090	0.000	0.020	0	0.10	0	0.6	0	0.020
547	11/03/86	0.0140	0.0050	0.000	0.020	*	*	0	0.5	0	0.009

Southern California Edison Company Environmental Monitoring Program Database Listings

Verified by: Mina Gaeters sPh.D. Date: 4/20/87

Table 12a: Quarterly Non-Migratory Marine Animals Analysis (Flesh type)

Control Location: C

Observation Number	Calendar Date	Sample Type	Location	K-40	K-40 (2 sigma)	Zn-65	Zn-65 (2 sigma)	Cs-134	Cs-134 (2 sigma)	Mn-54	Mn-54 (2 sigma)	Zr(Nb)-95
548	11/03/86	sea hare	B	1.20	0.06	0	0.02	0	0.002	0	0.005	0
549	11/05/86	black perch	A	2.40	0.10	0	0.06	0	0.006	0	0.010	0
550	11/05/86	spiny lobster	A	3.00	0.20	0	0.04	0	0.004	0	0.009	0
551	11/06/86	sheephead	C	2.50	0.10	0	0.06	0	0.006	0	0.010	0
552	11/06/86	black perch	C	2.50	0.10	0	0.06	0	0.006	0	0.010	0
553	11/06/86	spiny lobster	C	3.20	0.20	0	0.05	0	0.005	0	0.009	0
554	11/06/86	keyhole limpet	C	0.96	0.05	0	0.03	0	0.003	0	0.007	0
555	11/14/86	sea hare	A	0.99	0.05	0	0.02	0	0.003	0	0.004	0

Observation Number	Calendar Date	Zr(Nb)-95 (2 sigma)	Cs-137	Cs-137 (2 sigma)	Co-57	Co-57 (2 sigma)	Mo(Tc)-99	Mo(Tc)-99 (2 sigma)	Ce-141	Ce-141 (2 sigma)	Co-58	Co-58 (2 sigma)
548	11/03/86	0.01	0.0000	0.0020	0	0.005	0	10	0	0.02	0.000	0.003
549	11/05/86	0.03	0.0051	0.0006	0	0.010	0	6	0	0.06	0.000	0.010
550	11/05/86	0.02	0.0047	0.0002	0	0.009	0	4	0	0.04	0.000	0.004
551	11/06/86	0.03	0.0049	0.0003	0	0.010	0	20	0	0.06	0.000	0.006
552	11/06/86	0.03	0.0046	0.0002	0	0.010	0	20	0	0.06	0.000	0.010
553	11/06/86	0.02	0.0033	0.0002	0	0.009	0	20	0	0.05	0.000	0.009
554	11/06/86	0.02	0.0000	0.0030	0	0.007	0	50	0	0.03	0.000	0.007
555	11/14/86	0.01	0.0000	0.0030	0	0.004	0	2	0	0.02	0.026	0.003

Observation Number	Calendar Date	Ru-103	Ru-103 (2 sigma)	Ce-144	Ce-144 (2 sigma)	Fe-59	Fe-59 (2 sigma)	Ru-106	Ru-106 (2 sigma)	Ra-226	Ra-226 (2 sigma)	Co-60	Co-60 (2 sigma)
548	11/03/86	0	0.003	0	0.02	0	0.02	0	0.02	0.00	0.009	0.014	0.001
549	11/05/86	0	0.006	0	0.06	0	0.06	0	0.06	0.00	0.020	0.002	0.001
550	11/05/86	0	0.007	0	0.04	0	0.04	0	0.04	0.00	0.020	0.006	0.002
551	11/06/86	0	0.030	0	0.06	0	0.06	0	0.03	0.00	0.020	0.000	0.006
552	11/06/86	0	0.006	0	0.06	0	0.06	0	0.06	0.00	0.020	0.000	0.006
553	11/06/86	0	0.008	0	0.05	0	0.05	0	0.05	0.00	0.020	0.000	0.009
554	11/06/86	0	0.005	0	0.03	0	0.03	0	0.03	0.00	0.010	0.000	0.007
555	11/14/86	0	0.004	0	0.02	0	0.02	0	0.02	0.04	0.010	0.136	0.007

Observation Number	Calendar Date	Ag-110m	Ag-110m (2 sigma)	Th-228	Th-228 (2 sigma)	I-131	I-131 (2 sigma)	Bound H-3	Bound H-3 (2 sigma)	Aqueous H-3	Aqueous H-3 (2 sigma)
548	11/03/86	0.0000	0.0020	0.00	0.009	0	0.06	0	0.2	0	0.008
549	11/05/86	0.0000	0.0060	0.00	0.020	0	0.10	0	0.6	0	0.020
550	11/05/86	0.0040	0.0020	0.00	0.020	0	0.10	0	0.4	0	0.010
551	11/06/86	0.0000	0.0060	0.00	0.020	0	0.10	0	0.6	0	0.020
552	11/06/86	0.0000	0.0060	0.00	0.020	0	0.10	0	0.6	0	0.020
553	11/06/86	0.0000	0.0050	0.00	0.020	0	0.10	0	0.5	0	0.010
554	11/06/86	0.0070	0.0003	0.00	0.010	0	0.10	0	0.3	0	0.010
555	11/14/86	0.0019	0.0001	0.05	0.040	0	0.05	0	0.2	0	0.006

10:37 MONDAY, APRIL 20, 1987

Southern California Edison Company Environmental Monitoring Program Database Listings

Verified by: Mina Goeters, Ph.D. Date: 4/20/87

Table 12b: Quarterly Non-Migratory Marine Animals Analysis (Bone Type)

Control Location: C

Observation Number	Calendar Date	Sample Type	Location	K-40	K-40 (2 sigma)	Zn-65	Zn-65 (2 sigma)	Cs-134	Cs-134 (2 sigma)	Mn-54	Mn-54 (2 sigma)	Zr(Nb)-95
422	02/28/86	sheephead	C	0.00	0.30	0.00	0.06	0	0.020	0	0.02	0
423	02/28/86	black perch	C	0.17	0.09	0.00	0.06	0	0.020	0	0.02	0
424	02/28/86	spiny lobster	C	1.18	0.09	0.00	0.06	0	0.006	0	0.01	0
425	02/28/86	keyhole limpet	C	0.00	0.40	0.00	0.09	0	0.020	0	0.02	0
426	03/04/86	sheephead	A	0.80	0.30	0.00	0.10	0	0.050	0	0.04	0
427	03/04/86	black perch	A	1.00	0.40	0.00	0.10	0	0.060	0	0.06	0
428	03/04/86	sheephead	B	0.00	0.50	0.00	0.10	0	0.020	0	0.02	0
429	03/04/86	black perch	B	1.00	0.30	0.00	0.10	0	0.020	0	0.03	0

Observation Number	Calendar Date	Zr(Nb)-95 (2 sigma)	Cs-137	Cs-137 (2 sigma)	Co-57	Co-57 (2 sigma)	Mo(Tc)-99	Mo(Tc)-99 (2 sigma)	Ce-141	Ce-141 (2 sigma)	Co-58	Co-58 (2 sigma)
422	02/28/86	0.03	0	0.020	0	0.010	0	6	0	0.06	0	0.030
423	02/28/86	0.03	0	0.020	0	0.010	0	9	0	0.06	0	0.020
424	02/28/86	0.03	0	0.006	0	0.010	0	6	0	0.06	0	0.009
425	02/28/86	0.05	0	0.020	0	0.009	0	2	0	0.09	0	0.020
426	03/04/86	0.06	0	0.040	0	0.020	0	10	0	0.10	0	0.050
427	03/04/86	0.06	0	0.060	0	0.040	0	10	0	0.10	0	0.060
428	03/04/86	0.06	0	0.020	0	0.020	0	10	0	0.10	0	0.020
429	03/04/86	0.05	0	0.030	0	0.020	0	10	0	0.10	0	0.040

Observation Number	Calendar Date	Ru-103	Ru-103 (2 sigma)	Ce-144	Ce-144 (2 sigma)	Fe-59	Fe-59 (2 sigma)	Ru-106	Ru-106 (2 sigma)	Ra-226	Ra-226 (2 sigma)	Co-60	Co-60 (2 sigma)
422	02/28/86	0	0.030	0	0.06	0	0.06	0	0.10	0	0.06	0.000	0.010
423	02/28/86	0	0.030	0	0.09	0	0.06	0	0.20	0	0.06	0.000	0.030
424	02/28/86	0	0.009	0	0.06	0	0.06	0	0.06	0	0.03	0.000	0.009
425	02/28/86	0	0.030	0	0.09	0	0.09	0	0.20	0	0.04	0.000	0.020
426	03/04/86	0	0.050	0	0.20	0	0.10	0	0.40	0	0.06	0.000	0.060
427	03/04/86	0	0.060	0	0.30	0	0.20	0	0.60	0	0.10	0.000	0.100
428	03/04/86	0	0.040	0	0.10	0	0.10	0	0.20	0	0.05	0.000	0.030
429	03/04/86	0	0.040	0	0.20	0	0.10	0	0.30	0	0.10	0.000	0.050

Observation Number	Calendar Date	Ag-110m	Ag-110m (2 sigma)	Th-228	Th-228 (2 sigma)	I-131	I-131 (2 sigma)	Bound H-3	Bound H-3 (2 sigma)	Aqueous H-3	Aqueous H-3 (2 sigma)
422	02/28/86	0.000	0.020	0	0.03	0	0.2	*	*	*	*
423	02/28/86	0.000	0.020	0	0.03	0	0.2	*	*	*	*
424	02/28/86	0.000	0.009	0	0.03	0	0.2	*	*	*	*
425	02/28/86	0.000	0.020	0	0.04	0	0.5	*	*	*	*
426	03/04/86	0.000	0.040	0	0.06	0	0.3	*	*	*	*
427	03/04/86	0.000	0.060	0	0.10	0	0.3	*	*	*	*
428	03/04/86	0.000	0.030	0	0.05	0	0.3	*	*	*	*
429	03/04/86	0.000	0.050	0	0.05	0	0.2	*	*	*	*

Southern California Edison Company Environmental Monitoring Program Database Listings

Verified by: Mina Cortes, Ph.D. Date: 4/20/87

Table 12b: Quarterly Non-Migratory Marine Animals Analysis (Bone Type)

Control Location: C

Observation Number	Calendar Date	Sample Type	Location	K-40	K-40 (2 sigma)	Zn-65	Zn-65 (2 sigma)	Cs-134	Cs-134 (2 sigma)	Mn-54	Mn-54 (2 sigma)	Zr(Nb)-95
430	03/04/86	bay mussel	B	0.17	0.05	0.00	0.09	0	0.009	0	0.02	0
431	03/05/86	spiny lobster	A	0.87	0.07	0.00	0.07	0	0.007	0	0.01	0
432	03/05/86	bay mussel	A	0.15	0.05	0.00	0.10	0	0.010	0	0.02	0
433	03/07/86	spiny lobster	B	0.80	0.10	0.00	0.06	0	0.006	0	0.01	0
434	05/12/86	bay mussel	B	0.16	0.06	0.00	0.09	0	0.009	0	0.02	0
435	05/15/86	sheephead	C	0.30	0.10	0.00	0.10	0	0.020	0	0.03	0
436	05/15/86	black perch	C	0.00	0.30	0.00	0.10	0	0.020	0	0.03	0
437	05/15/86	keyhole limpet	C	0.10	0.02	0.00	0.09	0	0.020	0	0.02	0

Observation Number	Calendar Date	Zr(Nb)-95 (2 sigma)	Cs-137	Cs-137 (2 sigma)	Co-57	Co-57 (2 sigma)	Mo(Tc)-99	Mo(Tc)-99 (2 sigma)	Ce-141	Ce-141 (2 sigma)	Co-58	Co-58 (2 sigma)
430	03/04/86	0.05	0	0.009	0	0.020	0	20	0	0.09	0	0.02
431	03/05/86	0.04	0	0.007	0	0.010	0	7	0	0.07	0	0.01
432	03/05/86	0.05	0	0.010	0	0.020	0	10	0	0.10	0	0.02
433	03/07/86	0.03	0	0.006	0	0.010	0	6	0	0.06	0	0.01
434	05/12/86	0.05	0	0.009	0	0.020	0	400	0	0.09	0	0.02
435	05/15/86	0.06	0	0.030	0	0.020	0	600	0	0.10	0	0.04
436	05/15/86	0.06	0	0.030	0	0.020	0	1000	0	0.10	0	0.03
437	05/15/86	0.04	0	0.020	0	0.009	0	400	0	0.09	0	0.02

Observation Number	Calendar Date	Ru-103	Ru-103 (2 sigma)	Ce-144	Ce-144 (2 sigma)	Fe-59	Fe-59 (2 sigma)	Ru-106	Ru-106 (2 sigma)	Ra-226	Ra-226 (2 sigma)	Co-60	Co-60 (2 sigma)
430	03/04/86	0	0.020	0	0.09	0	0.09	0	0.09	0	0.04	0.000	0.009
431	03/05/86	0	0.010	0	0.07	0	0.07	0	0.07	0	0.03	0.017	0.002
432	03/05/86	0	0.020	0	0.10	0	0.10	0	0.10	0	0.04	0.000	0.020
433	03/07/86	0	0.010	0	0.06	0	0.06	0	0.06	0	0.02	0.005	0.002
434	05/12/86	0	0.020	0	0.09	0	0.09	0	0.09	0	0.04	0.000	0.009
435	05/15/86	0	0.060	0	0.10	0	0.10	0	0.20	0	0.04	0.000	0.030
436	05/15/86	0	0.060	0	0.10	0	0.10	0	0.20	0	0.06	0.000	0.020
437	05/15/86	0	0.030	0	0.09	0	0.09	0	0.20	0	0.04	0.000	0.020

Observation Number	Calendar Date	Ag-110m	Ag-110m (2 sigma)	Th-228	Th-228 (2 sigma)	I-131	I-131 (2 sigma)	Bound H-3	Bound H-3 (2 sigma)	Aqueous H-3	Aqueous H-3 (2 sigma)
430	03/04/86	0.000	0.020	0	0.04	0	0.2	*	*	*	*
431	03/05/86	0.000	0.007	0	0.03	0	0.2	*	*	*	*
432	03/05/86	0.000	0.020	0	0.04	0	0.2	*	*	*	*
433	03/07/86	0.000	0.006	0	0.02	0	0.2	*	*	*	*
434	05/12/86	0.000	0.020	0	0.04	0	0.3	*	*	*	*
435	05/15/86	0.000	0.030	0	0.04	0	0.6	*	*	*	*
436	05/15/86	0.000	0.030	0	0.04	0	1.0	*	*	*	*
437	05/15/86	0.000	0.020	0	0.04	0	0.5	*	*	*	*

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Southern California Edison Company Environmental Monitoring Program Database Listings

Verified by: Mina Goeters, Ph.D. Date: 4/20/87

Table 12b: Quarterly Non-Migratory Marine Animals Analysis (Bone Type)

Control Location: C

Observation Number	Calendar Date	Sample Type	Location	K-40	K-40 (2 sigma)	Zn-65	Zn-65 (2 sigma)	Cs-134	Cs-134 (2 sigma)	Mn-54	Mn-54 (2 sigma)	Zr(Nb)-95
438	05/16/86	spiny lobster	A	0.91	0.07	0.00	0.07	0	0.007	0	0.01	0
439	05/16/86	spiny lobster	B	1.11	0.07	0.00	0.07	0	0.007	0	0.01	0
440	05/16/86	spiny lobster	C	0.91	0.07	0.00	0.07	0	0.007	0	0.01	0
441	05/20/86	black perch	A	0.80	0.40	0.00	0.09	0	0.030	0	0.03	0
442	05/20/86	sheephead	B	2.00	1.00	0.00	0.10	0	0.020	0	0.02	0
443	05/21/86	sheephead	A	0.60	0.30	0.00	0.10	0	0.030	0	0.02	0
444	05/21/86	black perch	B	0.40	0.30	0.00	0.10	0	0.030	0	0.03	0
445	08/05/86	sheephead	B	0.70	0.20	0.00	0.10	0	0.030	0	0.03	0

Observation Number	Calendar Date	Zr(Nb)-95 (2 sigma)	Cs-137	Cs-137 (2 sigma)	Co-57	Co-57 (2 sigma)	Mo(Tc)-99	Mo(Tc)-99 (2 sigma)	Ce-141	Ce-141 (2 sigma)	Co-58	Co-58 (2 sigma)
438	05/16/86	0.03	0	0.007	0	0.010	0	30	0	0.07	0	0.01
439	05/16/86	0.03	0	0.007	0	0.010	0	100	0	0.07	0	0.01
440	05/16/86	0.03	0	0.007	0	0.010	0	200	0	0.07	0	0.01
441	05/20/86	0.05	0	0.040	0	0.020	0	90	0	0.09	0	0.05
442	05/20/86	0.06	0	0.030	0	0.020	0	100	0	0.10	0	0.03
443	05/21/86	0.06	0	0.030	0	0.020	0	100	0	0.10	0	0.04
444	05/21/86	0.05	0	0.040	0	0.020	0	20	0	0.10	0	0.04
445	08/05/86	0.06	0	0.030	0	0.020	0	10	0	0.10	0	0.03

Observation Number	Calendar Date	Ru-103	Ru-103 (2 sigma)	Ce-144	Ce-144 (2 sigma)	Fe-59	Fe-59 (2 sigma)	Ru-106	Ru-106 (2 sigma)	Ra-226	Ra-226 (2 sigma)	Co-60	Co-60 (2 sigma)
438	05/16/86	0	0.010	0	0.07	0	0.07	0	0.07	0	0.03	0.007	0.002
439	05/16/86	0	0.010	0	0.07	0	0.07	0	0.07	0	0.03	0.000	0.010
440	05/16/86	0	0.010	0	0.07	0	0.07	0	0.07	0	0.03	0.000	0.010
441	05/20/86	0	0.050	0	0.20	0	0.10	0	0.30	0	0.09	0.000	0.050
442	05/20/86	0	0.050	0	0.10	0	0.10	0	0.20	0	0.05	0.000	0.020
443	05/21/86	0	0.050	0	0.10	0	0.10	0	0.20	0	0.05	0.020	0.006
444	05/21/86	0	0.050	0	0.20	0	0.10	0	0.30	0	0.05	0.000	0.040
445	08/05/86	0	0.040	0	0.10	0	0.10	0	0.30	0	0.06	0.000	0.030

Observation Number	Calendar Date	Ag-110m	Ag-110m (2 sigma)	Th-228	Th-228 (2 sigma)	I-131	I-131 (2 sigma)	Bound H-3	Bound H-3 (2 sigma)	Aqueous H-3	Aqueous H-3 (2 sigma)
438	05/16/86	0.005	0.002	0	0.03	0	0.2	*	*	*	*
439	05/16/86	0.000	0.010	0	0.03	0	0.2	*	*	*	*
440	05/16/86	0.000	0.010	0	0.03	0	0.2	*	*	*	*
441	05/20/86	0.000	0.040	0	0.05	0	0.5	*	*	*	*
442	05/20/86	0.000	0.030	0	0.05	0	0.6	*	*	*	*
443	05/21/86	0.000	0.030	0	0.05	0	0.5	*	*	*	*
444	05/21/86	0.000	0.050	0	0.05	0	0.3	*	*	*	*
445	08/05/86	0.000	0.030	0	0.05	0	0.3	*	*	*	*

Southern California Edison Company Environmental Monitoring Program Database Listings

Verified by: Mina Cooter, Ph.D. Date: 4/20/87

Table 12b: Quarterly Non-Migratory Marine Animals Analysis (Bone Type)

Control Location: C

Observation Number	Calendar Date	Sample Type	Location	K-40	K-40 (2 sigma)	Zn-65	Zn-65 (2 sigma)	Cs-134	Cs-134 (2 sigma)	Mn-54	Mn-54 (2 sigma)	Zr(Nb)-95
446	08/05/86	black perch	B	0.60	0.40	0.00	0.20	0	0.060	0	0.06	0
447	08/06/86	sheephead	A	0.40	0.30	0.00	0.10	0	0.050	0	0.04	0
448	08/06/86	black perch	A	0.70	0.20	0.00	0.10	0	0.040	0	0.05	0
449	08/06/86	spiny lobster	A	0.85	0.06	0.00	0.06	0	0.009	0	0.01	0
450	08/06/86	bay mussel	B	0.11	0.07	0.00	0.09	0	0.009	0	0.02	0
451	08/07/86	sheephead	C	0.40	0.20	0.00	0.10	0	0.040	0	0.03	0
452	08/07/86	black perch	C	0.00	0.50	0.00	0.10	0	0.040	0	0.05	0
453	08/07/86	keyhole limpet	C	0.00	0.20	0.00	0.09	0	0.020	0	0.02	0

Observation Number	Calendar Date	Zr(Nb)-95 (2 sigma)	Cs-137	Cs-137 (2 sigma)	Co-57	Co-57 (2 sigma)	Mo(Tc)-99	Mo(Tc)-99 (2 sigma)	Ce-141	Ce-141 (2 sigma)	Co-58	Co-58 (2 sigma)
446	08/05/86	0.06	0	0.060	0	0.040	0	10	0	0.10	0	0.06
447	08/06/86	0.06	0	0.050	0	0.030	0	10	0	0.10	0	0.04
448	08/06/86	0.06	0	0.050	0	0.030	0	10	0	0.10	0	0.06
449	08/06/86	0.03	0	0.010	0	0.010	0	6	0	0.06	0	0.01
450	08/06/86	0.05	0	0.009	0	0.020	0	20	0	0.09	0	0.02
451	08/07/86	0.05	0	0.040	0	0.020	0	10	0	0.10	0	0.04
452	08/07/86	0.05	0	0.040	0	0.020	0	10	0	0.10	0	0.04
453	08/07/86	0.04	0	0.020	0	0.009	0	20	0	0.09	0	0.02

Observation Number	Calendar Date	Ru-103	Ru-103 (2 sigma)	Ce-144	Ce-144 (2 sigma)	Fe-59	Fe-59 (2 sigma)	Ru-106	Ru-106 (2 sigma)	Ra-226	Ra-226 (2 sigma)	Co-60	Co-60 (2 sigma)
446	08/05/86	0	0.100	0	0.30	0	0.20	0	0.50	0	0.10	0.000	0.060
447	08/06/86	0	0.060	0	0.20	0	0.10	0	0.40	0	0.10	0.000	0.020
448	08/06/86	0	0.060	0	0.20	0	0.10	0	0.30	0	0.10	0.000	0.060
449	08/06/86	0	0.020	0	0.06	0	0.06	0	0.09	0	0.03	0.000	0.010
450	08/06/86	0	0.020	0	0.09	0	0.09	0	0.09	0	0.04	0.000	0.009
451	08/07/86	0	0.050	0	0.20	0	0.10	0	0.20	0	0.05	0.000	0.040
452	08/07/86	0	0.050	0	0.20	0	0.10	0	0.40	0	0.10	0.000	0.040
453	08/07/86	0	0.030	0	0.09	0	0.09	0	0.20	0	0.04	0.000	0.020

Observation Number	Calendar Date	Ag-110m	Ag-110m (2 sigma)	Th-228	Th-228 (2 sigma)	I-131	I-131 (2 sigma)	Bound H-3	Bound H-3 (2 sigma)	Aqueous H-3	Aqueous H-3 (2 sigma)
446	08/05/86	0.000	0.060	0	0.10	0	0.4	*	*	*	*
447	08/06/86	0.000	0.040	0	0.06	0	0.3	*	*	*	*
448	08/06/86	0.000	0.040	0	0.06	0	0.3	*	*	*	*
449	08/06/86	0.000	0.010	0	0.03	0	0.2	*	*	*	*
450	08/06/86	0.000	0.020	0	0.04	0	0.3	*	*	*	*
451	08/07/86	0.000	0.030	0	0.04	0	0.2	*	*	*	*
452	08/07/86	0.000	0.050	0	0.05	0	0.2	*	*	*	*
453	08/07/86	0.000	0.020	0	0.04	0	0.4	*	*	*	*

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Verified by: Mina Goeters, Ph.D. Date: 4/20/87

Table 12b: Quarterly Non-Migratory Marine Animals Analysis (Bone Type)

Control Location: C

Observation Number	Calendar Date	Sample Type	Location	K-40	K-40 (2 sigma)	Zn-65	Zn-65 (2 sigma)	Cs-134	Cs-134 (2 sigma)	Mn-54	Mn-54 (2 sigma)	Zr(Nb)-95
454	08/08/86	spiny lobster	C	0.67	0.06	0.00	0.06	0	0.006	0	0.01	0
455	08/13/86	spiny lobster	B	0.88	0.06	0.00	0.06	0	0.006	0	0.01	0
456	11/03/86	sheephead	A	0.40	0.20	0.00	0.10	0	0.020	0	0.02	0
457	11/03/86	sheephead	B	0.00	0.50	0.00	0.10	0	0.030	0	0.03	0
458	11/03/86	black perch	B	0.00	1.00	0.00	0.10	0	0.040	0	0.03	0
459	11/03/86	spiny lobster	B	0.98	0.06	0.00	0.06	0	0.006	0	0.01	0
460	11/05/86	black perch	A	0.00	0.90	0.00	0.09	0	0.030	0	0.03	0
461	11/05/86	spiny lobster	A	0.92	0.06	0.06	0.06	0	0.006	0	0.01	0

Observation Number	Calendar Date	Zr(Nb)-95 (2 sigma)	Cs-137	Cs-137 (2 sigma)	Co-57	Co-57 (2 sigma)	Mo(Tc)-99	Mo(Tc)-99 (2 sigma)	Ce-141	Ce-141 (2 sigma)	Co-58	Co-58 (2 sigma)
454	08/08/86	0.03	0	0.006	0	0.010	0	6	0	0.06	0	0.01
455	08/13/86	0.03	0	0.006	0	0.010	0	6	0	0.06	0	0.01
456	11/03/86	0.06	0	0.030	0	0.020	0	10	0	0.10	0	0.03
457	11/03/86	0.05	0	0.030	0	0.020	0	20	0	0.10	0	0.04
458	11/03/86	0.05	0	0.030	0	0.020	0	50	0	0.10	0	0.05
459	11/03/86	0.03	0	0.006	0	0.010	0	30	0	0.06	0	0.01
460	11/05/86	0.05	0	0.030	0	0.020	0	10	0	0.09	0	0.04
461	11/05/86	0.03	0	0.006	0	0.010	0	6	0	0.06	0	0.01

Observation Number	Calendar Date	Ru-103	Ru-103 (2 sigma)	Ce-144	Ce-144 (2 sigma)	Fe-59	Fe-59 (2 sigma)	Ru-106	Ru-106 (2 sigma)	Ra-226	Ra-226 (2 sigma)	Co-60	Co-60 (2 sigma)
454	08/08/86	0	0.009	0	0.06	0	0.06	0	0.06	0	0.02	0.000	0.009
455	08/13/86	0	0.009	0	0.06	0	0.06	0	0.06	0	0.02	0.018	0.001
456	11/03/86	0	0.030	0	0.10	0	0.10	0	0.20	0	0.06	0.000	0.030
457	11/03/86	0	0.040	0	0.10	0	0.10	0	0.30	0	0.05	0.000	0.040
458	11/03/86	0	0.050	0	0.10	0	0.10	0	0.20	0	0.10	0.000	0.050
459	11/03/86	0	0.010	0	0.06	0	0.06	0	0.06	0	0.03	0.000	0.010
460	11/05/86	0	0.040	0	0.09	0	0.09	0	0.20	0	0.05	0.000	0.030
461	11/05/86	0	0.006	0	0.06	0	0.06	0	0.06	0	0.02	0.004	0.003

Observation Number	Calendar Date	Ag-110m	Ag-110m (2 sigma)	Th-228	Th-228 (2 sigma)	I-131	I-131 (2 sigma)	Bound H-3	Bound H-3 (2 sigma)	Aqueous H-3	Aqueous H-3 (2 sigma)
454	08/08/86	0.000	0.009	0	0.02	0	0.1	*	*	*	*
455	08/13/86	0.000	0.009	0	0.02	0	0.2	*	*	*	*
456	11/03/86	0.000	0.030	0	0.04	0	0.3	*	*	*	*
457	11/03/86	0.000	0.030	0	0.04	0	0.3	*	*	*	*
458	11/03/86	0.000	0.040	0	0.05	0	0.5	*	*	*	*
459	11/03/86	0.002	0.001	0	0.03	0	0.2	*	*	*	*
460	11/05/86	0.000	0.030	0	0.05	0	0.3	*	*	*	*
461	11/05/86	0.000	0.006	0	0.02	0	0.2	*	*	*	*

Southern California Edison Company Environmental Monitoring Program Database Listings

Verified by: Mina Peeters, Ph.D. Date: 4/20/87

Table 12b: Quarterly Non-Migratory Marine Animals Analysis (Bone Type)

Control Location: C

Observation Number	Calendar Date	Sample Type	Location	K-40	K-40 (2 sigma)	Zn-65	Zn-65 (2 sigma)	Cs-134	Cs-134 (2 sigma)	Mn-54	Mn-54 (2 sigma)	Zr(Nb)-95
462	11/06/86	sheephead	C	0.60	0.30	0	0.10	0	0.040	0	0.03	0
463	11/06/86	black perch	C	0.00	0.50	0	0.10	0	0.020	0	0.03	0
464	11/06/86	spiny lobster	C	0.62	0.06	0	0.06	0	0.006	0	0.01	0
465	11/06/86	keyhole limpet	C	0.18	0.09	0	0.09	0	0.020	0	0.02	0

Observation Number	Calendar Date	Zr(Nb)-95 (2 sigma)	Cs-137	Cs-137 (2 sigma)	Co-57	Co-57 (2 sigma)	Mo(Tc)-99	Mo(Tc)-99 (2 sigma)	Ce-141	Ce-141 (2 sigma)	Co-58	Co-58 (2 sigma)
462	11/06/86	0.05	0	0.040	0	0.020	0	50	0	0.10	0	0.04
463	11/06/86	0.05	0	0.030	0	0.020	0	100	0	0.10	0	0.04
464	11/06/86	0.03	0	0.006	0	0.010	0	30	0	0.06	0	0.01
465	11/06/86	0.04	0	0.020	0	0.009	0	40	0	0.09	0	0.03

Observation Number	Calendar Date	Ru-103	Ru-103 (2 sigma)	Ce-144	Ce-144 (2 sigma)	Fe-59	Fe-59 (2 sigma)	Ru-106	Ru-106 (2 sigma)	Ra-226	Ra-226 (2 sigma)	Co-60	Co-60 (2 sigma)
462	11/06/86	0	0.050	0	0.10	0	0.10	0	0.20	0	0.04	0	0.040
463	11/06/86	0	0.050	0	0.10	0	0.10	0	0.20	0	0.05	0	0.040
464	11/06/86	0	0.009	0	0.06	0	0.06	0	0.06	0	0.02	0	0.006
465	11/06/86	0	0.040	0	0.09	0	0.09	0	0.20	0	0.04	0	0.020

Observation Number	Calendar Date	Ag-110m	Ag-110m (2 sigma)	Th-228	Th-228 (2 sigma)	I-131	I-131 (2 sigma)	Bound H-3	Bound H-3 (2 sigma)	Aqueous H-3	Aqueous H-3 (2 sigma)
462	11/06/86	0	0.030	0	0.04	0	0.4	*	*	*	*
463	11/06/86	0	0.030	0	0.05	0	0.5	*	*	*	*
464	11/06/86	0	0.006	0	0.02	0	0.2	*	*	*	*
465	11/06/86	0	0.020	0	0.04	0	0.4	*	*	*	*

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Verified by: Mina Cooters, Ph.D. Date: 4/20/87

Table 13a: Semi-Annual Local Crops Gamma Spectral Analysis

Control Location: #2

Observation Number	Calendar Date	Sample Type	Location	Be-7	Be-7 (2 sigma)	Zr(Nb)-95	Zr(Nb)-95 (2 sigma)	Cs-134	Cs-134 (2 sigma)
91	06/25/86	cucumber	1	0	0.01	0	0.004	0	0.0010
92	06/25/86	corn	1	0	0.08	0	0.030	0	0.0080
93	06/25/86	kale	2	0	0.04	0	0.010	0	0.0040
94	06/25/86	tomato	2	0	0.02	0	0.005	0	0.0020
95	11/10/86	cauliflower	1	0	0.02	0	0.006	0	0.0020
96	11/10/86	kale	2	0	0.04	0	0.010	0	0.0030
97	11/10/86	tomato	2	0	0.02	0	0.006	0	0.0010
98	11/13/86	tomato	1	0	0.01	0	0.005	0	0.0009

Observation Number	Calendar Date	K-40	K-40 (2 sigma)	Ru-103	Ru-103 (2 sigma)	Cs-137	Cs-137 (2 sigma)	Co-58	Co-58 (2 sigma)	Ag-110m
91	06/25/86	1.08	0.04	0	0.004	0.0000	0.0010	0	0.002	0
92	06/25/86	15.40	0.80	0	0.030	0.0000	0.0080	0	0.010	0
93	06/25/86	2.80	0.10	0	0.010	0.0037	0.0003	0	0.007	0
94	06/25/86	1.60	0.10	0	0.005	0.0100	0.0050	0	0.002	0
95	11/10/86	2.20	0.10	0	0.006	0.0000	0.0010	0	0.003	0
96	11/10/86	2.60	0.10	0	0.010	0.0000	0.0030	0	0.007	0
97	11/10/86	1.17	0.06	0	0.006	0.0000	0.0010	0	0.003	0
98	11/13/86	1.90	0.09	0	0.005	0.0000	0.0009	0	0.002	0

Observation Number	Calendar Date	Ag-110m (2 sigma)	Ce-141	Ce-141 (2 sigma)	Co-60	Co-60 (2 sigma)	I-131	I-131 (2 sigma)	Ce-144	Ce-144 (2 sigma)
91	06/25/86	0.002	0	0.004	0	0.002	0	0.001	0	0.008
92	06/25/86	0.010	0	0.030	0	0.010	0	0.008	0	0.050
93	06/25/86	0.007	0	0.010	0	0.007	0	0.004	0	0.030
94	06/25/86	0.002	0	0.005	0	0.002	0	0.002	0	0.010
95	11/10/86	0.003	0	0.006	0	0.003	0	0.002	0	0.010
96	11/10/86	0.007	0	0.010	0	0.007	0	0.004	0	0.030
97	11/10/86	0.003	0	0.006	0	0.003	0	0.002	0	0.010
98	11/13/86	0.002	0	0.005	0	0.002	0	0.001	0	0.009

N= 8

Southern California Edison Company Environmental Monitoring Program Database Listings

Verified by: Myrna Godders, Ph.D. Date: 4/20/87

Table 13b: Semi-Annual Local Crops Tritium and Strontium Activities

Control Location: #2

Observation Number	Calendar Date	Sample Type	Location	Sr-89	Sr-89 (2 sigma)	Sr-90	Sr-90 (2 sigma)	Bound H-3	Bound H-3 (2 sigma)	Aqueous H-3	Aqueous H-3 (2 sigma)
157	06/25/86	cucumber	1	*	*	0.000	0.001	0	0.08	0	0.003
158	06/25/86	corn	1	*	*	0.000	0.010	0	0.50	0	0.020
159	06/25/86	kale	2	*	*	0.010	0.006	0	0.30	0	0.008
160	06/25/86	tomato	2	*	*	0.000	0.002	0	0.10	0	0.004
161	11/10/86	cauliflower	1	*	*	0.000	0.002	0	0.10	0	0.004
162	11/10/86	kale	2	*	*	0.011	0.005	0	0.30	0	0.008
163	11/10/86	tomato	2	*	*	0.000	0.002	0	0.10	0	0.003
164	11/13/86	tomato	1	*	*	0.000	0.002	0	0.09	0	0.004

N= 8

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Southern California Edison Company Environmental Monitoring Program Database Listings

Verified by: Mina Coates, Ph.D. Date: 4/20/87

Table 14: Annual Soil Analysis

Control Location: #4

Observation Number	Calendar Date	Location	Be-7	Be-7 (2 sigma)	Zr(Nb)-95	Zr(Nb)-95 (2 sigma)	Cs-134	Cs-134 (2 sigma)	K-40	K-40 (2 sigma)	Ru-103
55	12/17/86	1	0	0.3	0	0.1	0	0.05	17.4	0.9	0
56	12/17/86	2	0	0.3	0	0.1	0	0.05	5.8	0.3	0
57	12/18/86	3	0	0.3	0	0.1	0	0.05	14.4	0.7	0
58	12/18/86	4	0	0.3	0	0.1	0	0.05	18.0	1.0	0
59	12/18/86	5	0	0.3	0	0.1	0	0.05	15.1	0.8	0

Observation Number	Calendar Date	Ru-103 (2 sigma)	Cs-137	Cs-137 (2 sigma)	Co-58	Co-58 (2 sigma)	Ag-110m	Ag-110m (2 sigma)	Ce-141	Ce-141 (2 sigma)
55	12/17/86	0.1	0.11	0.02	0	0.05	0	0.05	0	0.1
56	12/17/86	0.1	0.03	0.02	0	0.05	0	0.05	0	0.1
57	12/18/86	0.1	0.00	0.02	0	0.05	0	0.05	0	0.1
58	12/18/86	0.1	0.00	0.02	0	0.05	0	0.05	0	0.1
59	12/18/86	0.1	0.00	0.02	0	0.05	0	0.05	0	0.1

Observation Number	Calendar Date	Co-60	Co-60 (2 sigma)	I-131	I-131 (2 sigma)	Ce-144	Ce-144 (2 sigma)	Sr-89	Sr-89 (2 sigma)	Sr-90	Sr-90 (2 sigma)
55	12/17/86	0	0.02	0	0.5	0	0.2	*	*	0.03	0.01
56	12/17/86	0	0.02	0	0.5	0	0.2	*	*	0.02	0.01
57	12/18/86	0	0.02	0	0.5	0	0.2	*	*	0.00	0.01
58	12/18/86	0	0.02	0	0.5	0	0.2	*	*	0.02	0.01
59	12/18/86	0	0.04	0	0.5	0	0.2	*	*	0.04	0.01

N= 5

Southern California Edison Company Environmental Monitoring Program Database Listings

Verified by: Mina Gouders, Ph.D. Date: 4/20/87

Table 15: Semi-Annual Kelp Analysis

Control Location: D

Observation Number	Calendar Date	Sample Type	Location	K-40	K-40 (2 sigma)	Zn-65	Zn-65 (2 sigma)	Cs-134	Cs-134 (2 sigma)	Mn-54	Mn-54 (2 sigma)	Zr(Nb)-95
99	05/14/86	macrocystis p.	A	7.6	0.3	0	0.02	0	0.003	0	0.004	0
100	05/14/86	macrocystis P.	B	6.8	0.3	0	0.03	0	0.006	0	0.006	0
101	05/14/86	macrocystis p.	D	6.9	0.4	0	0.02	0	0.005	0	0.005	0
102	06/16/86	macrocystis p.	A	8.3	0.3	0	0.03	0	0.005	0	0.007	0
103	06/16/86	macrocystis p.	B	5.2	0.3	0	0.03	0	0.004	0	0.005	0
104	06/16/86	macrocystis p.	D	5.3	0.2	0	0.02	0	0.003	0	0.005	0
105	11/18/86	macrocystis p.	A	7.6	0.3	0	0.02	0	0.003	0	0.004	0
106	11/18/86	macrocystis p.	B	5.5	0.3	0	0.02	0	0.003	0	0.004	0

Observation Number	Calendar Date	Zr(Nb)-95 (2 sigma)	Cs-137	Cs-137 (2 sigma)	Co-57	Co-57 (2 sigma)	Mo(Tc)-99	Mo(Tc)-99 (2 sigma)	Ce-141	Ce-141 (2 sigma)	Co-58	Co-58 (2 sigma)
99	05/14/86	0.009	0.0047	0.0002	0	0.004	0	2	0	0.02	0	0.004
100	05/14/86	0.010	0.0057	0.0003	0	0.006	0	3	0	0.03	0	0.004
101	05/14/86	0.010	0.0044	0.0002	0	0.005	0	2	0	0.02	0	0.004
102	06/16/86	0.010	0.0048	0.0002	0	0.007	0	3	0	0.03	0	0.007
103	06/16/86	0.010	0.0043	0.0003	0	0.005	0	3	0	0.03	0	0.004
104	06/16/86	0.010	0.0000	0.0050	0	0.005	0	2	0	0.02	0	0.005
105	11/18/86	0.009	0.0040	0.0002	0	0.004	0	2	0	0.02	0	0.004
106	11/18/86	0.010	0.0026	0.0001	0	0.004	0	2	0	0.02	0	0.003

Observation Number	Calendar Date	Ru-103	Ru-103 (2 sigma)	Ce-144	Ce-144 (2 sigma)	Fe-59	Fe-59 (2 sigma)	Ru-106	Ru-106 (2 sigma)	Ra-226	Ra-226 (2 sigma)	Co-60	Co-60 (2 sigma)
99	05/14/86	0	0.009	0	0.02	0	0.02	0	0.02	0	0.009	0	0.004
100	05/14/86	0	0.010	0	0.03	0	0.03	0	0.03	0	0.010	0	0.006
101	05/14/86	0	0.009	0	0.02	0	0.02	0	0.02	0	0.009	0	0.005
102	06/16/86	0	0.010	0	0.03	0	0.03	0	0.03	0	0.010	0	0.007
103	06/16/86	0	0.010	0	0.03	0	0.03	0	0.03	0	0.010	0	0.005
104	06/16/86	0	0.009	0	0.02	0	0.02	0	0.03	0	0.009	0	0.006
105	11/18/86	0	0.009	0	0.02	0	0.02	0	0.02	0	0.009	0	0.004
106	11/18/86	0	0.008	0	0.02	0	0.02	0	0.02	0	0.008	0	0.004

Observation Number	Calendar Date	Ag-110m	Ag-110m (2 sigma)	Th-228	Th-228 (2 sigma)	I-131	I-131 (2 sigma)	Bound H-3	Bound H-3 (2 sigma)	Aqueous H-3	Aqueous H-3 (2 sigma)
99	05/14/86	0	0.003	0	0.009	0.250	0.010	0	0.2	0	0.007
100	05/14/86	0	0.004	0	0.010	0.240	0.010	0	0.3	0	0.008
101	05/14/86	0	0.005	0	0.009	0.129	0.008	0	0.2	0	0.008
102	06/16/86	0	0.005	0	0.010	0.065	0.009	0	0.3	0	0.010
103	06/16/86	0	0.004	0	0.010	0.056	0.006	0	0.3	0	0.009
104	06/16/86	0	0.003	0	0.009	0.049	0.006	0	0.2	0	0.008
105	11/18/86	0	0.003	0	0.009	0.008	0.006	0	0.2	0	0.007
106	11/18/86	0	0.003	0	0.008	0.000	0.005	0	0.2	0	0.006

10:37 MONDAY, APRIL 20, 1987

Southern California Edison Company Environmental Monitoring Program Database Listings

Verified by: Mina Gouchers, Ph.D. Date: 4/20/87

Table 15: Semi-Annual Kelp Analysis

Control Location: D

Observation Number	Calendar Date	Sample Type	Location	K-40	K-40 (2 sigma)	Zn-65	Zn-65 (2 sigma)	Cs-134	Cs-134 (2 sigma)	Mn-54	Mn-54 (2 sigma)	Zr(Nb)-95
107	11/19/86	macrocystis p.	D	7.3	0.4	0	0.02	0	0.003	0	0.004	0

Observation Number	Calendar Date	Zr(Nb)-95 (2 sigma)	Cs-137	Cs-137 (2 sigma)	Co-57	Co-57 (2 sigma)	Mo(Tc)-99	Mo(Tc)-99 (2 sigma)	Ce-141	Ce-141 (2 sigma)	Co-58	Co-58 (2 sigma)
107	11/19/86	0.01	0.0034	0.0007	0	0.004	0	2	0	0.02	0	0.004

Observation Number	Calendar Date	Ru-103	Ru-103 (2 sigma)	Ce-144	Ce-144 (2 sigma)	Fe-59	Fe-59 (2 sigma)	Ru-106	Ru-106 (2 sigma)	Ra-226	Ra-226 (2 sigma)	Co-60	Co-60 (2 sigma)
107	11/19/86	0	0.008	0	0.02	0	0.02	0	0.02	0	0.008	0	0.005

Observation Number	Calendar Date	Ag-110m	Ag-110m (2 sigma)	Th-228	Th-228 (2 sigma)	I-131	I-131 (2 sigma)	Bound H-3	Bound H-3 (2 sigma)	Aqueous H-3	Aqueous H-3 (2 sigma)
107	11/19/86	0	0.003	0	0.008	0.049	0.005	0	0.2	0	0.007

N= 9

APPENDIX J

FIGURES

MONTHLY AVERAGE AIRBORNE PARTICULATES GROSS BETA ACTIVITY
SONGS UNITS 1, 2, 3

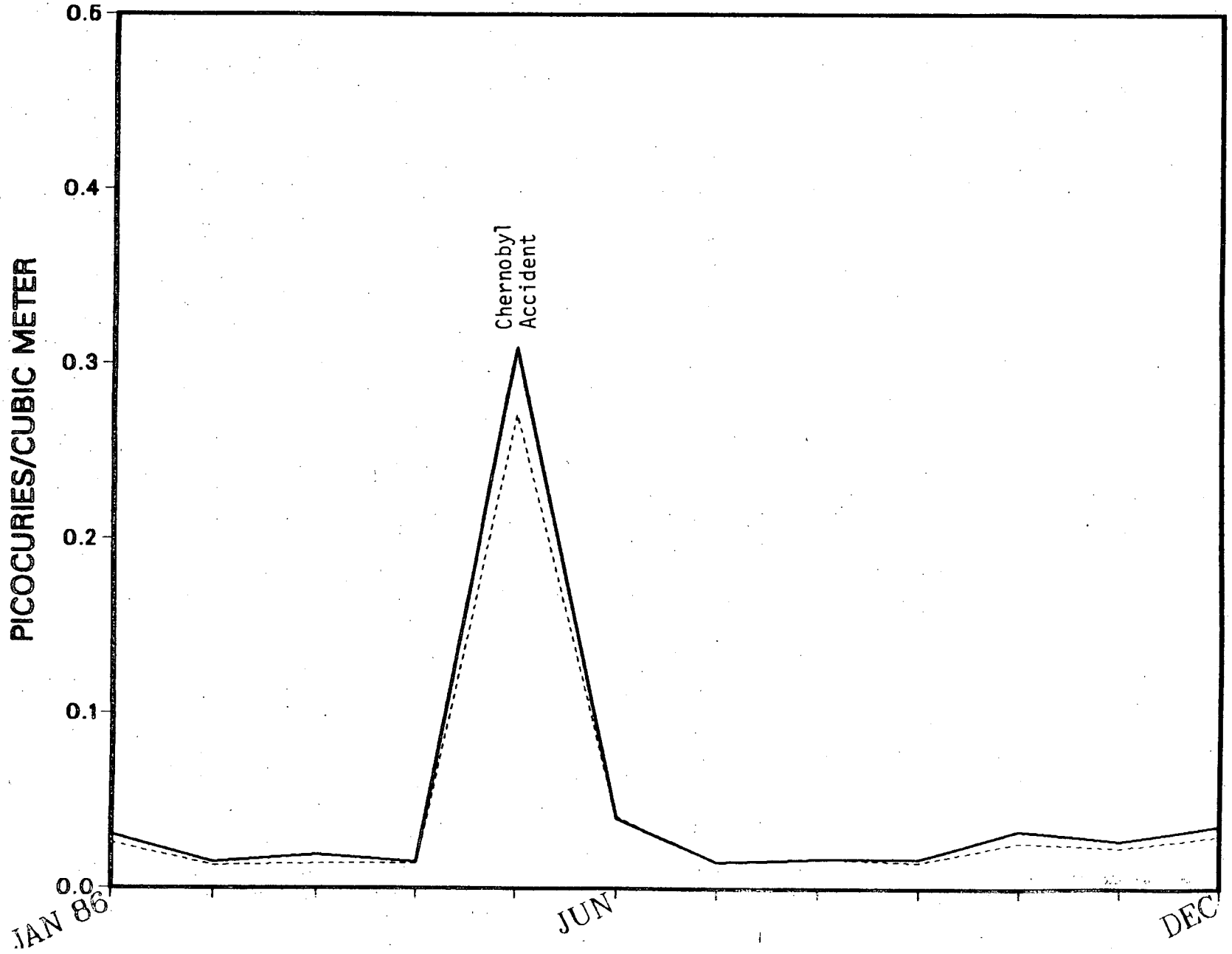

FIGURE 1

MONTHLY AVERAGE AIRBORNE PARTICULATES GROSS BETA ACTIVITY
SONGS UNITS 1, 2, 3

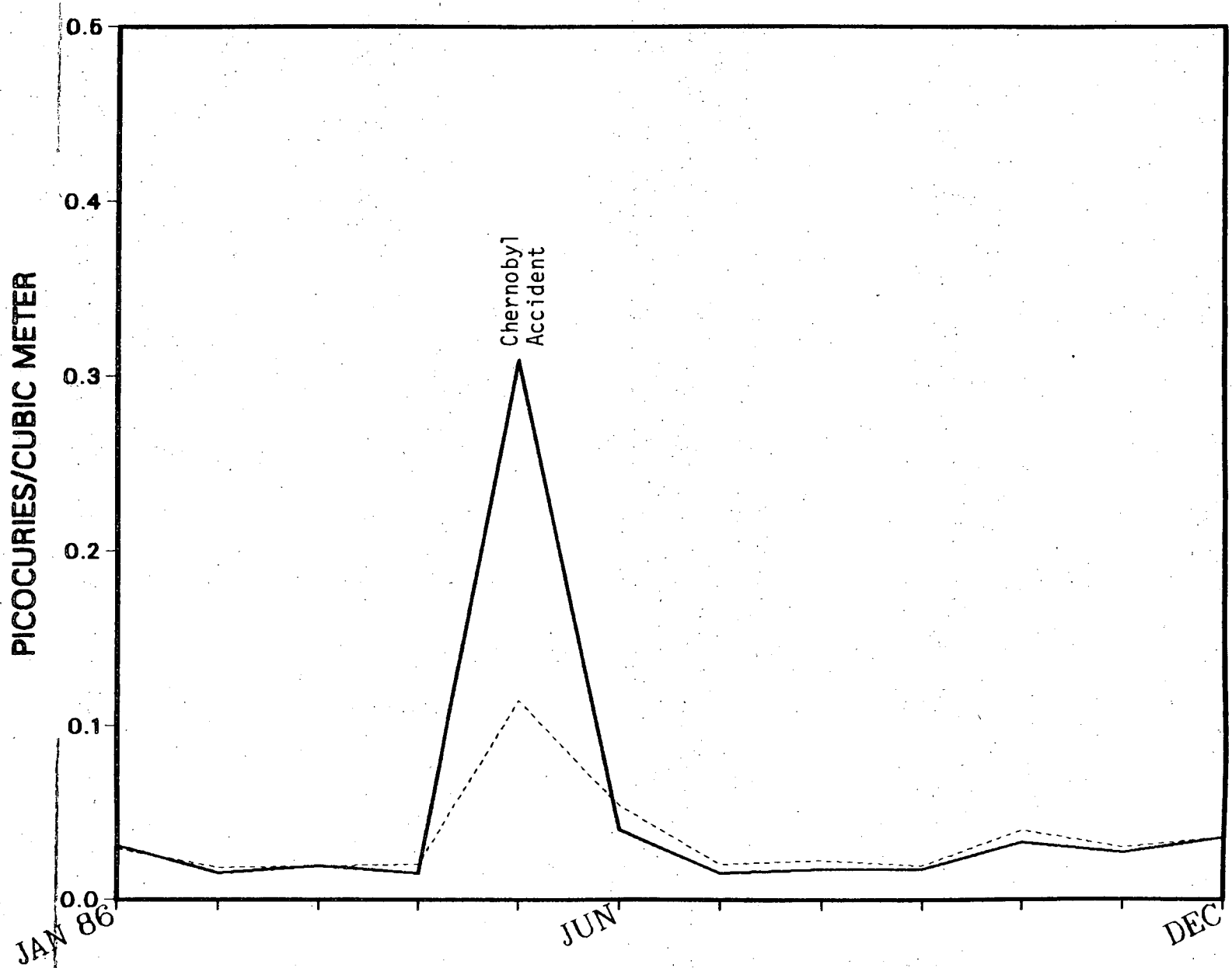

FIGURE 2

Legend
CONTROL
CAMP SAN ONOFRE

MONTHLY AVERAGE AIRBORNE PARTICULATES GROSS BETA ACTIVITY
SONGS UNITS 1, 2, 3

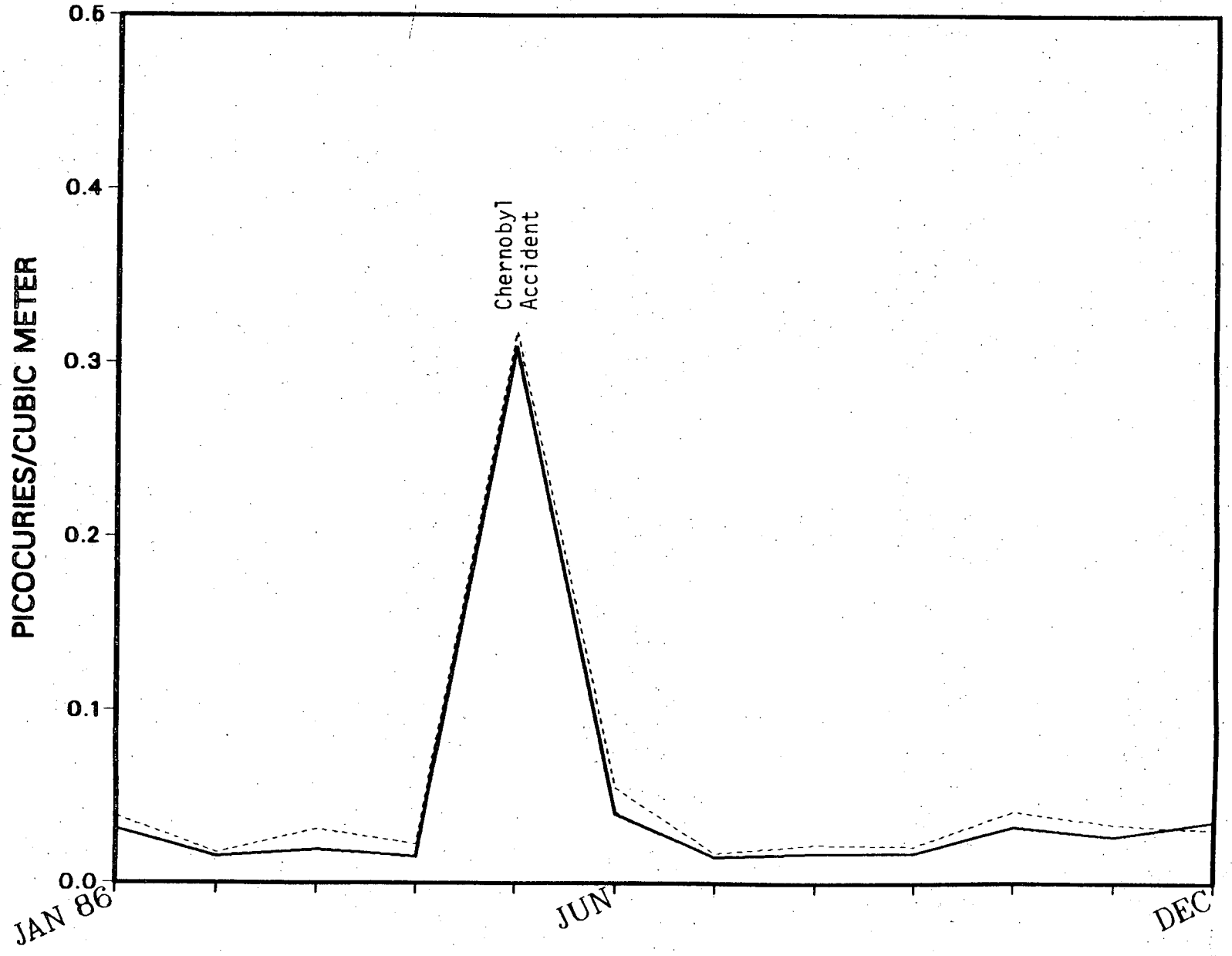

FIGURE 3

Legend
CONTROL
MESA E.O.F.

MONTHLY AVERAGE IODINE-131 IN AIR FOR 1986
SONGS UNITS 1, 2, 3

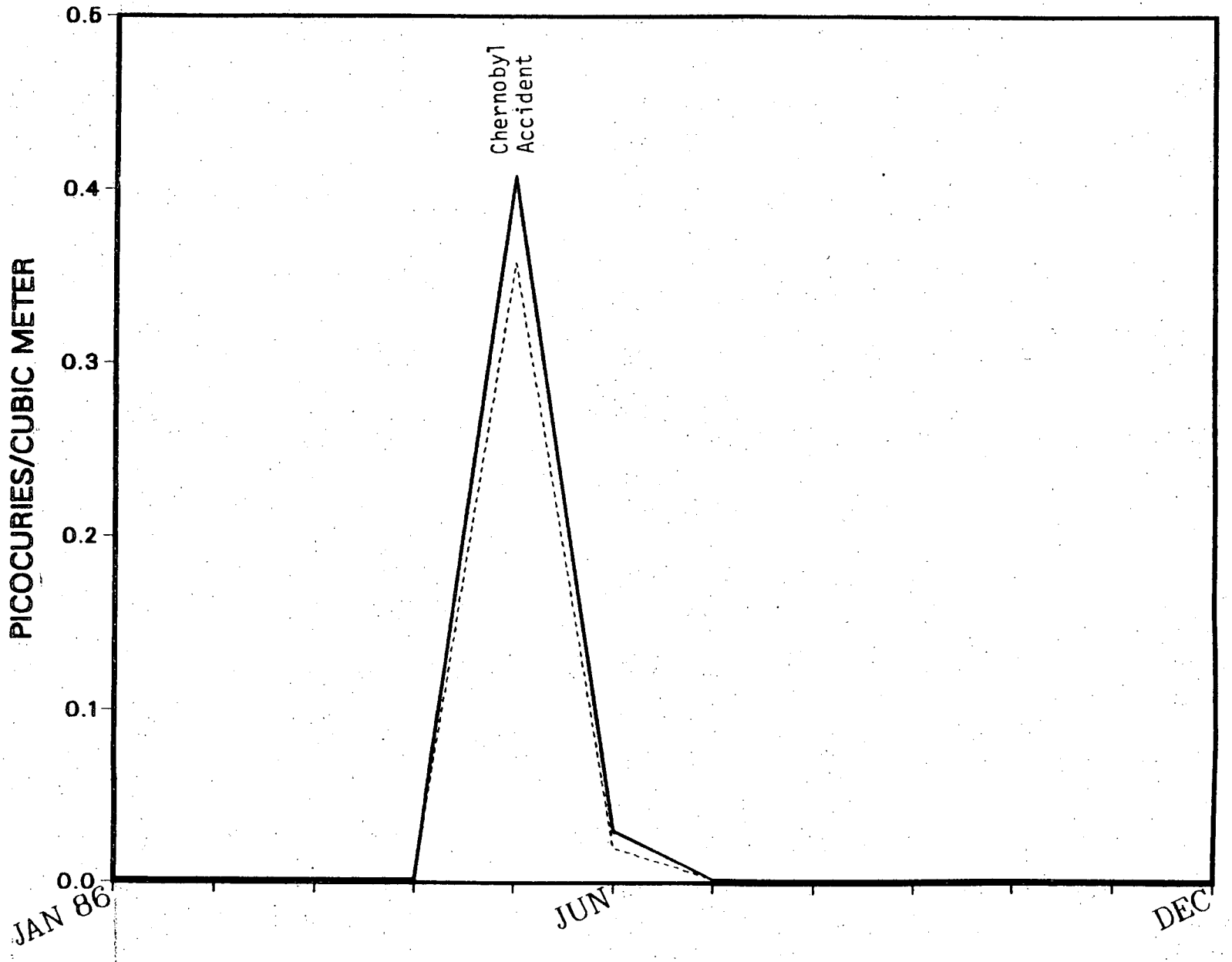

FIGURE 4

Legend
CONTROL
SAN CLEMENTE

MONTHLY AVERAGE IODINE-131 IN AIR FOR 1986
SONGS UNITS 1, 2, 3

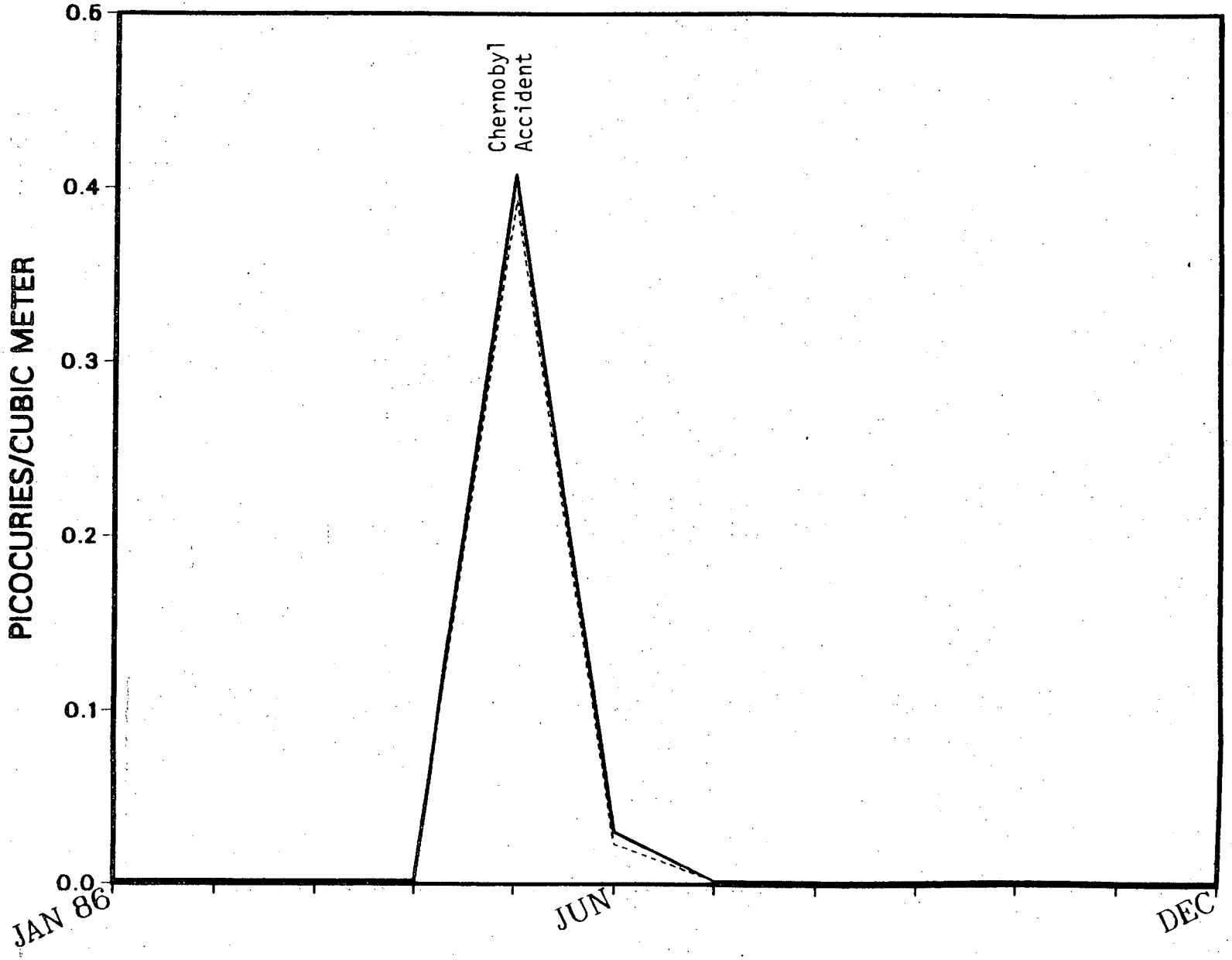

FIGURE 5

Legend
CONTROL
CAMP SAN ONOFRE

MONTHLY AVERAGE IODINE-131 IN AIR FOR 1986
SONGS UNITS 1, 2, 3

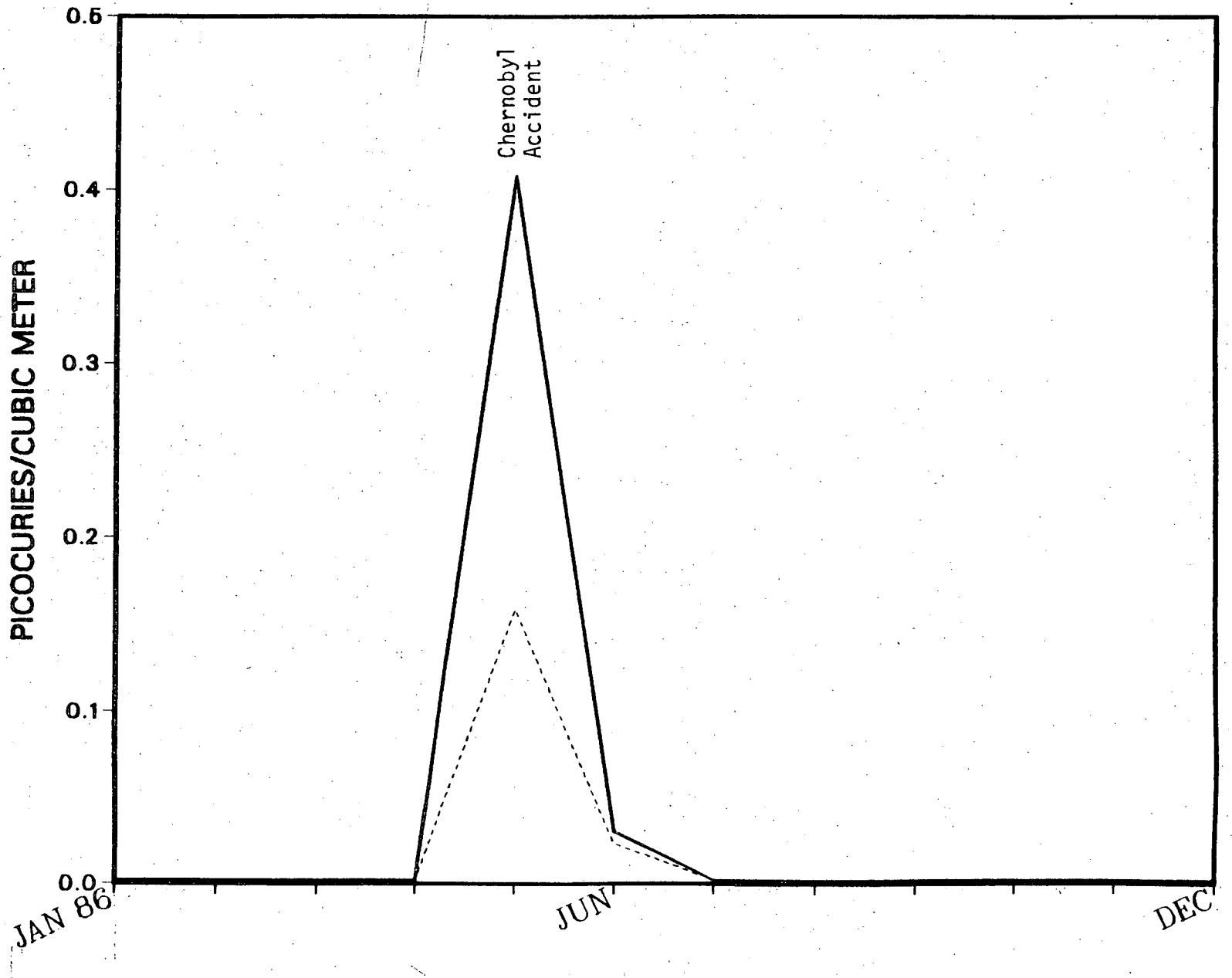

FIGURE 6

COBALT-58 IN FLESH OF SHEEPHEAD
UNIT 1 vs. CONTROL

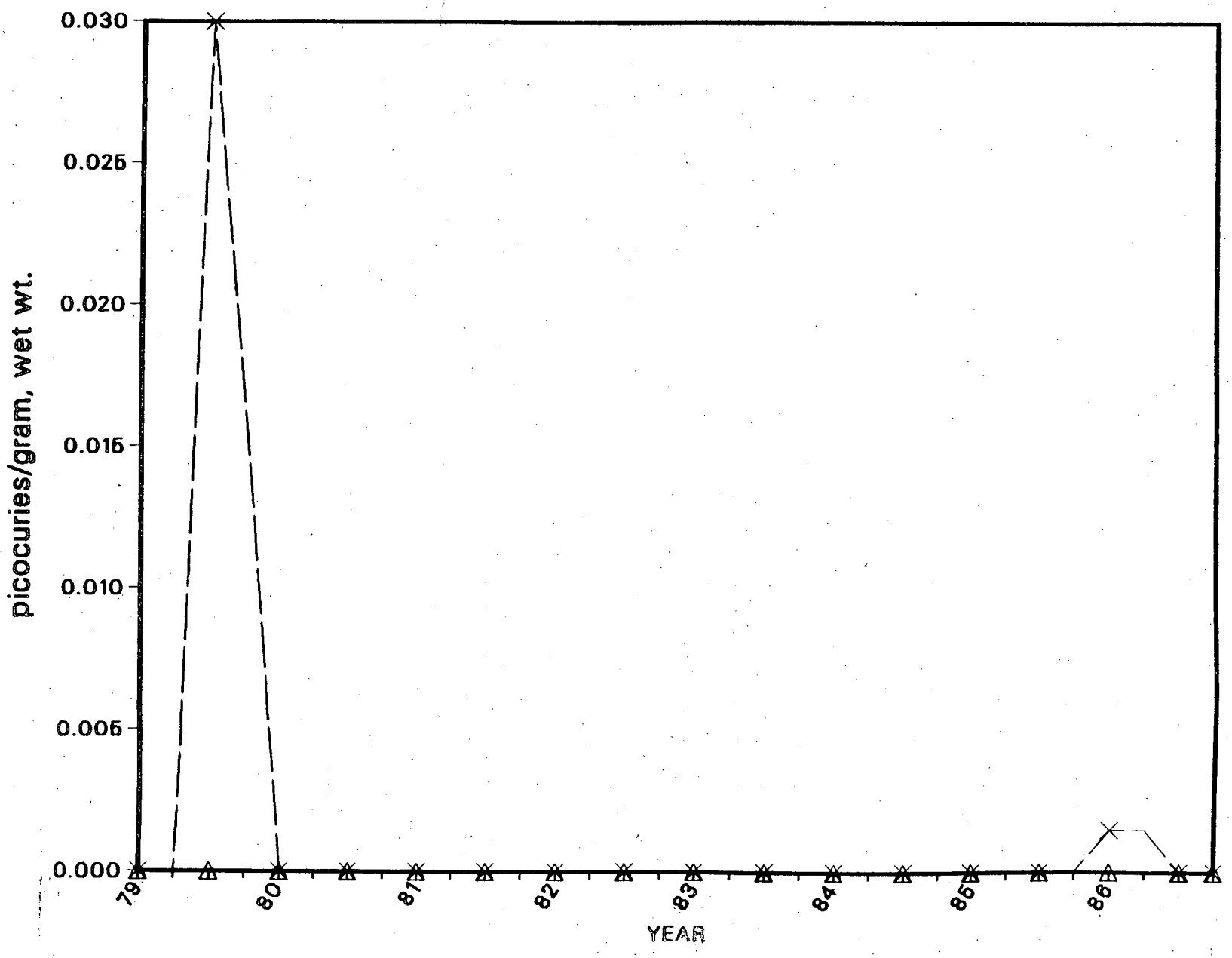

FIGURE 7

COBALT-60 IN FLESH OF SHEEPHEAD
UNIT 1 vs. CONTROL

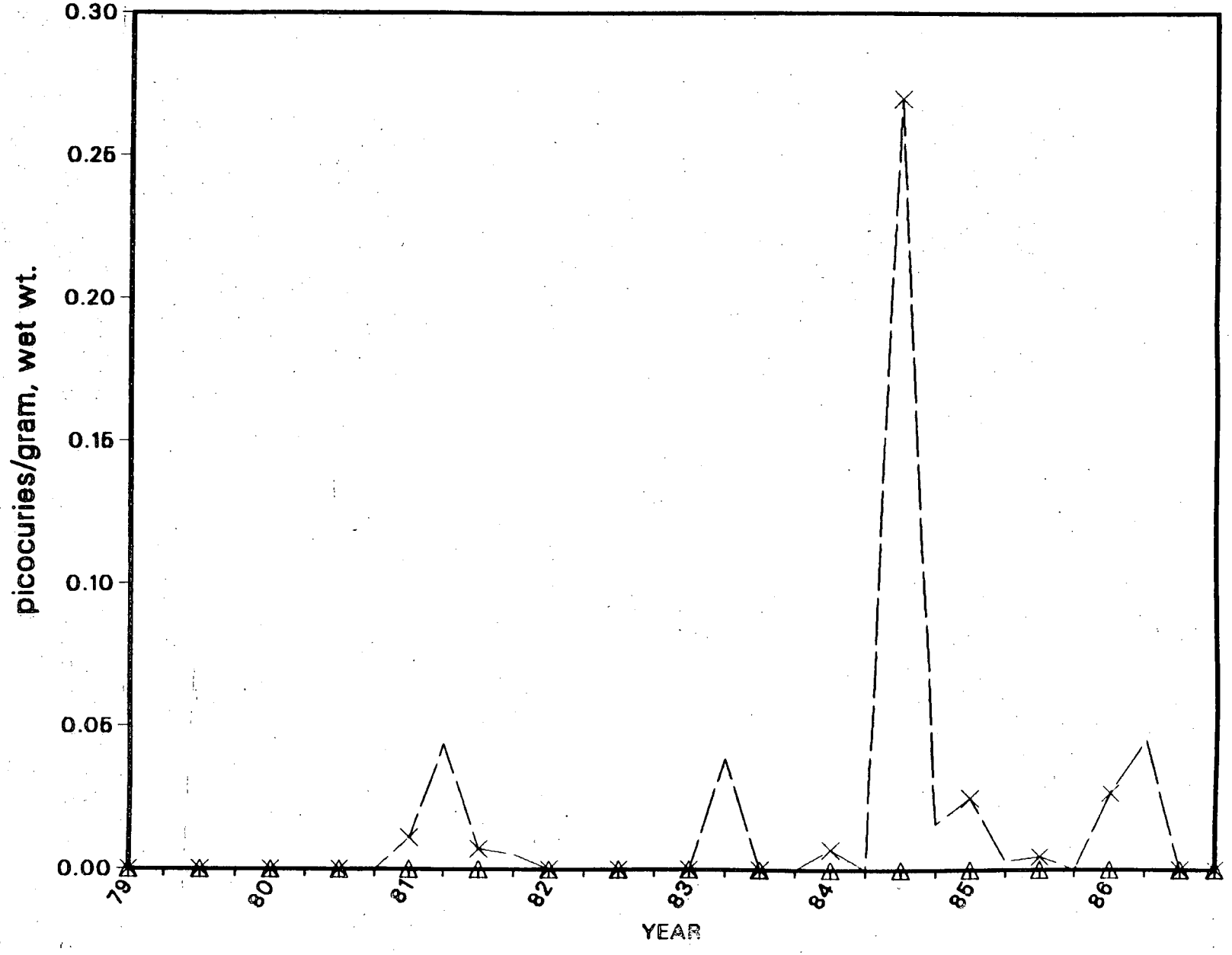

FIGURE 8

CESIUM-137 IN FLESH OF SHEEPHEAD
UNIT 1 vs. CONTROL

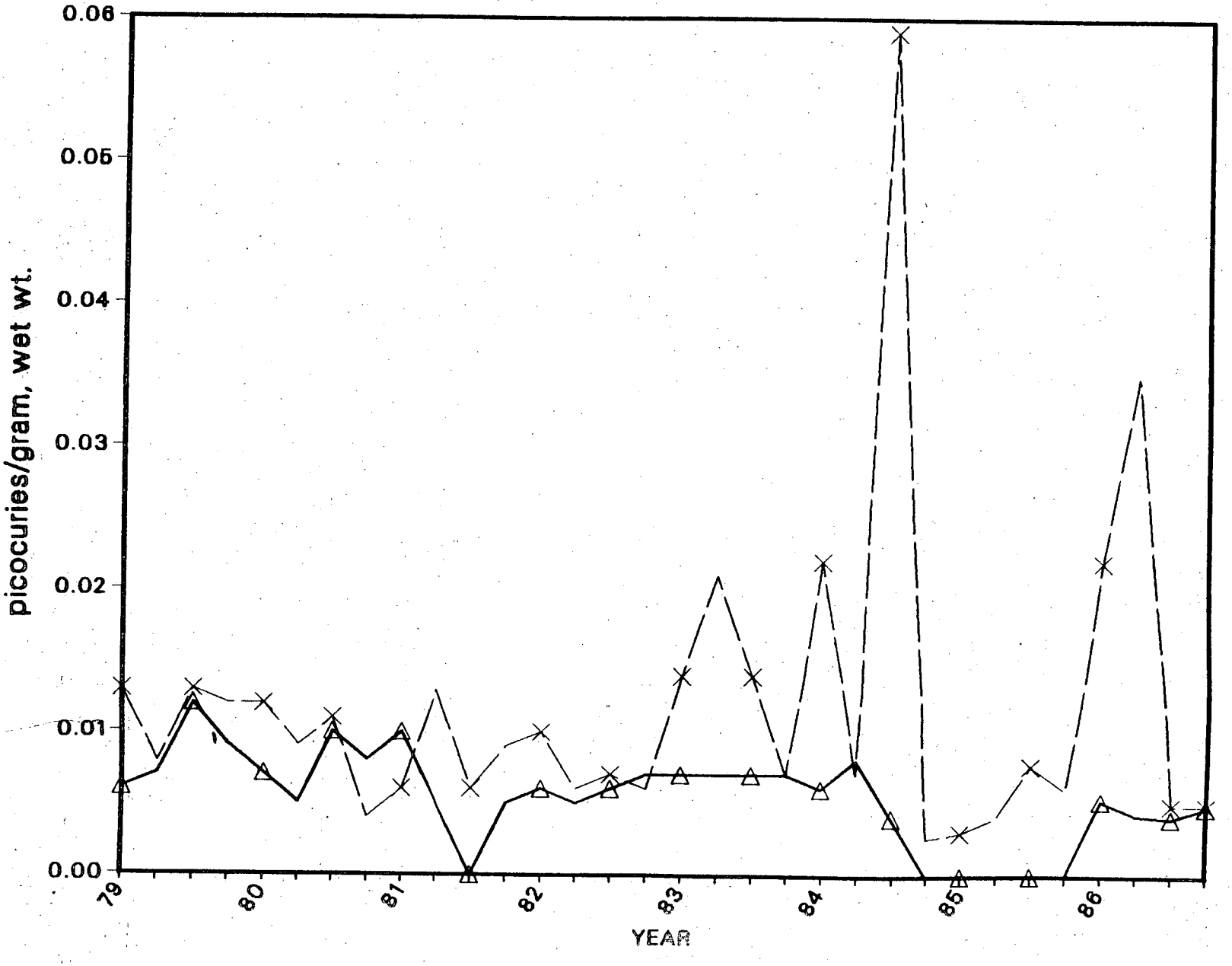

FIGURE 9

Legend
△ NEWPORT BEACH
× UNIT 1

COBALT-58 IN FLESH OF CRUSTACEA
UNIT I vs. CONTROL

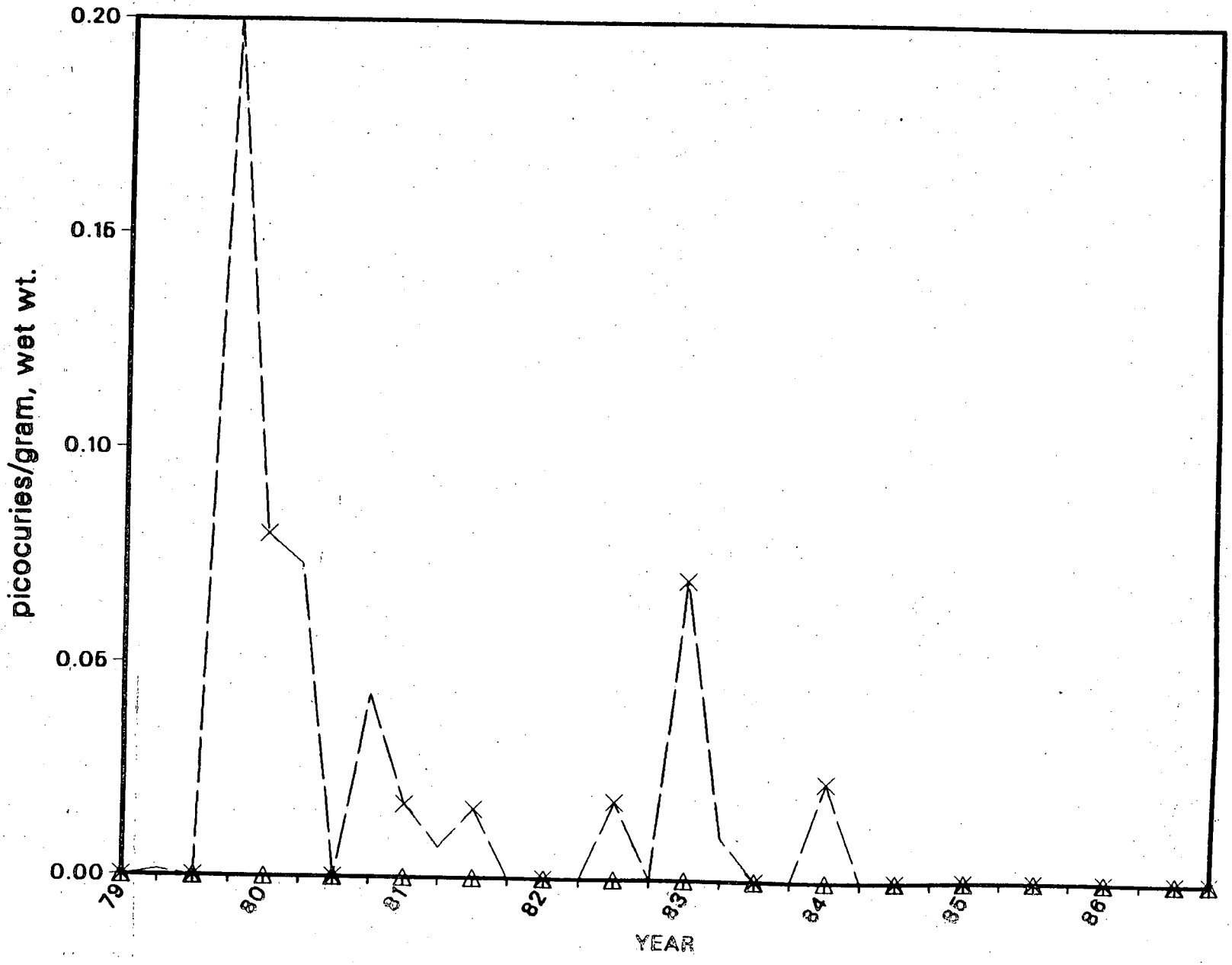

FIGURE 10

COBALT-60 IN FLESH OF CRUSTACEA
UNIT 1 vs. CONTROL

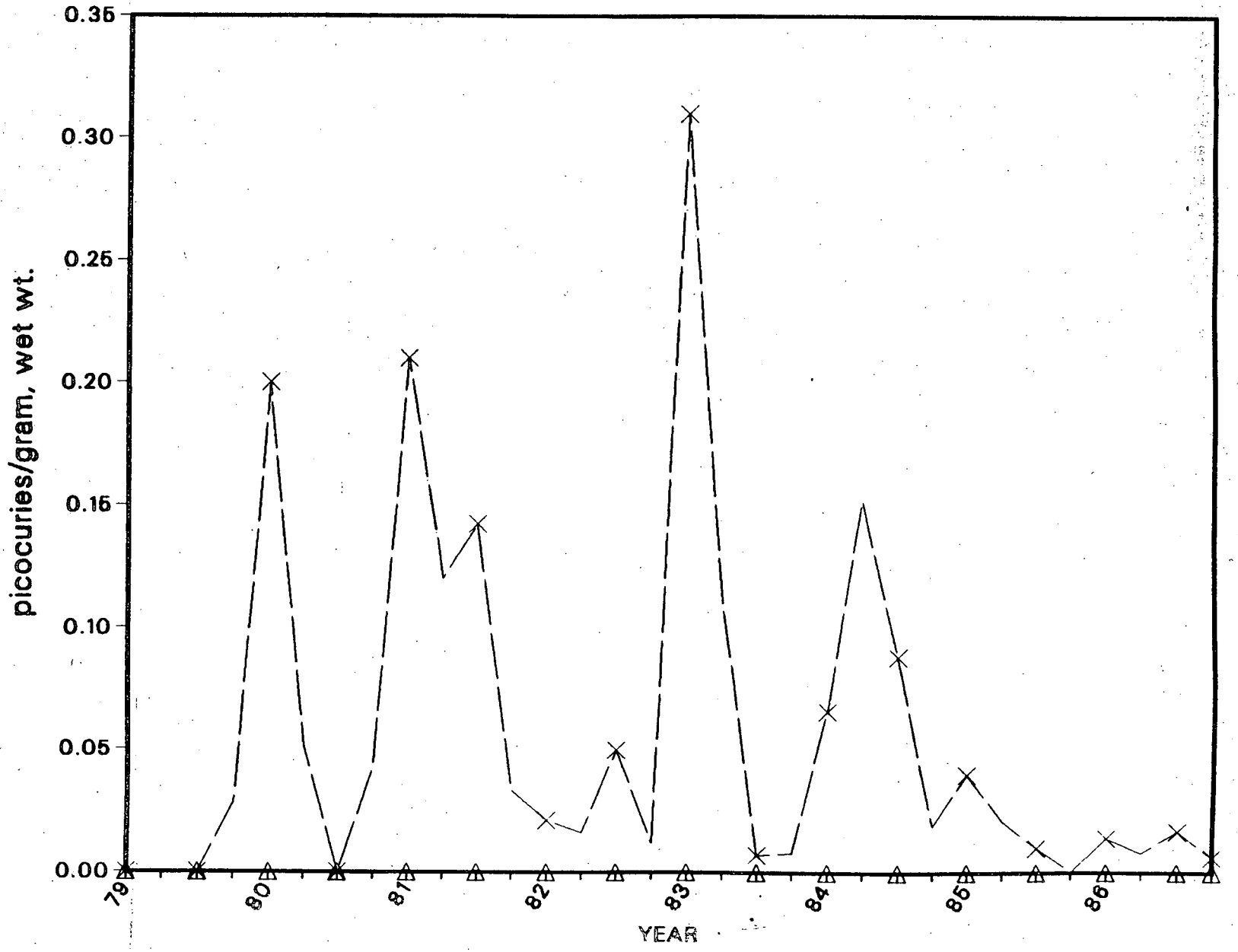

FIGURE 11

CESIUM-137 IN FLESH OF CRUSTACEA
UNIT 1 vs. CONTROL

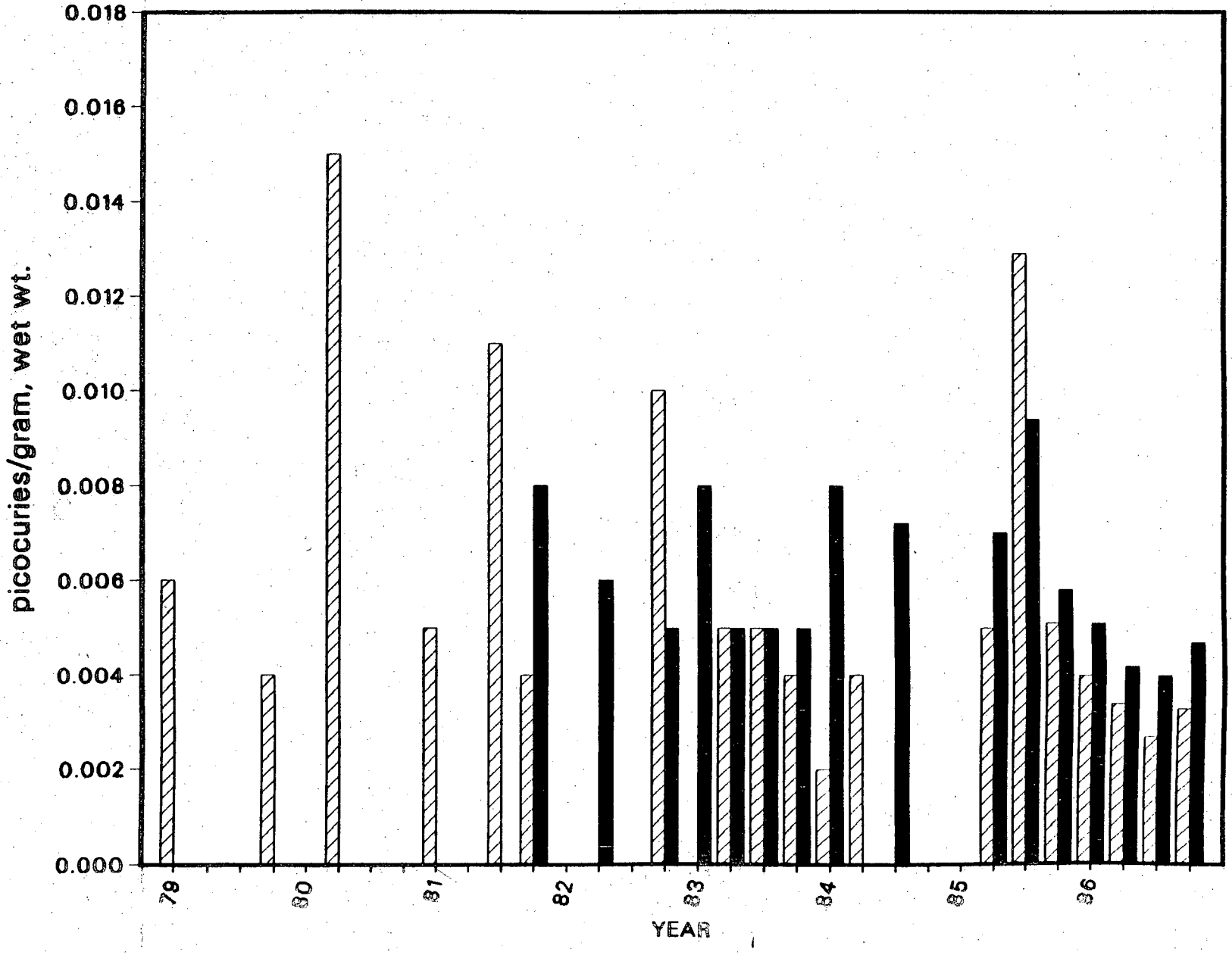

FIGURE 12

COBALT-58 IN FLESH OF MOLLUSKS
UNIT 1 vs. CONTROL

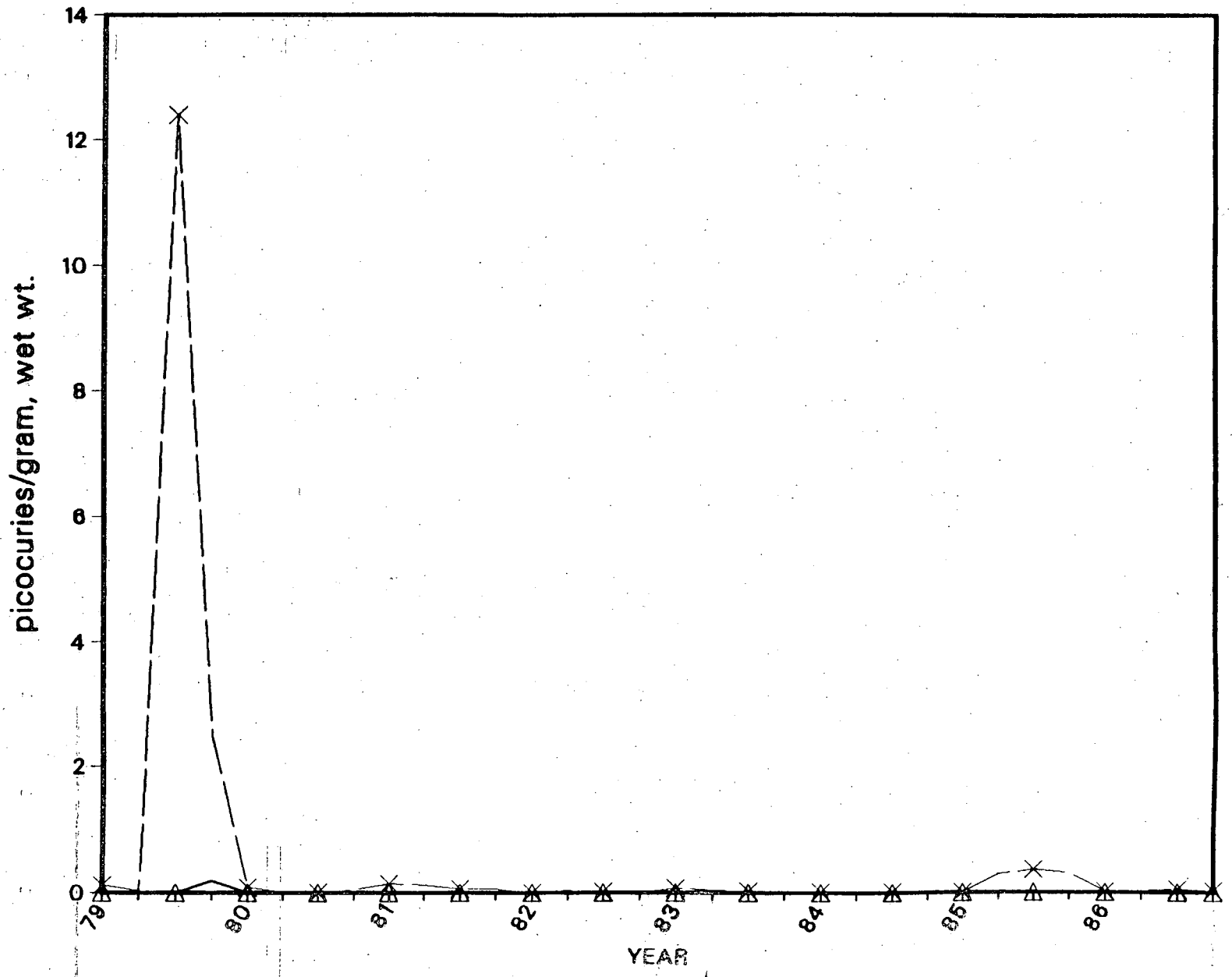

FIGURE 13

Legend

△ NEWPORT BEAC

× UNIT 1

COBALT-60 IN FLESH OF MOLLUSKS
UNIT 1 vs. CONTROL

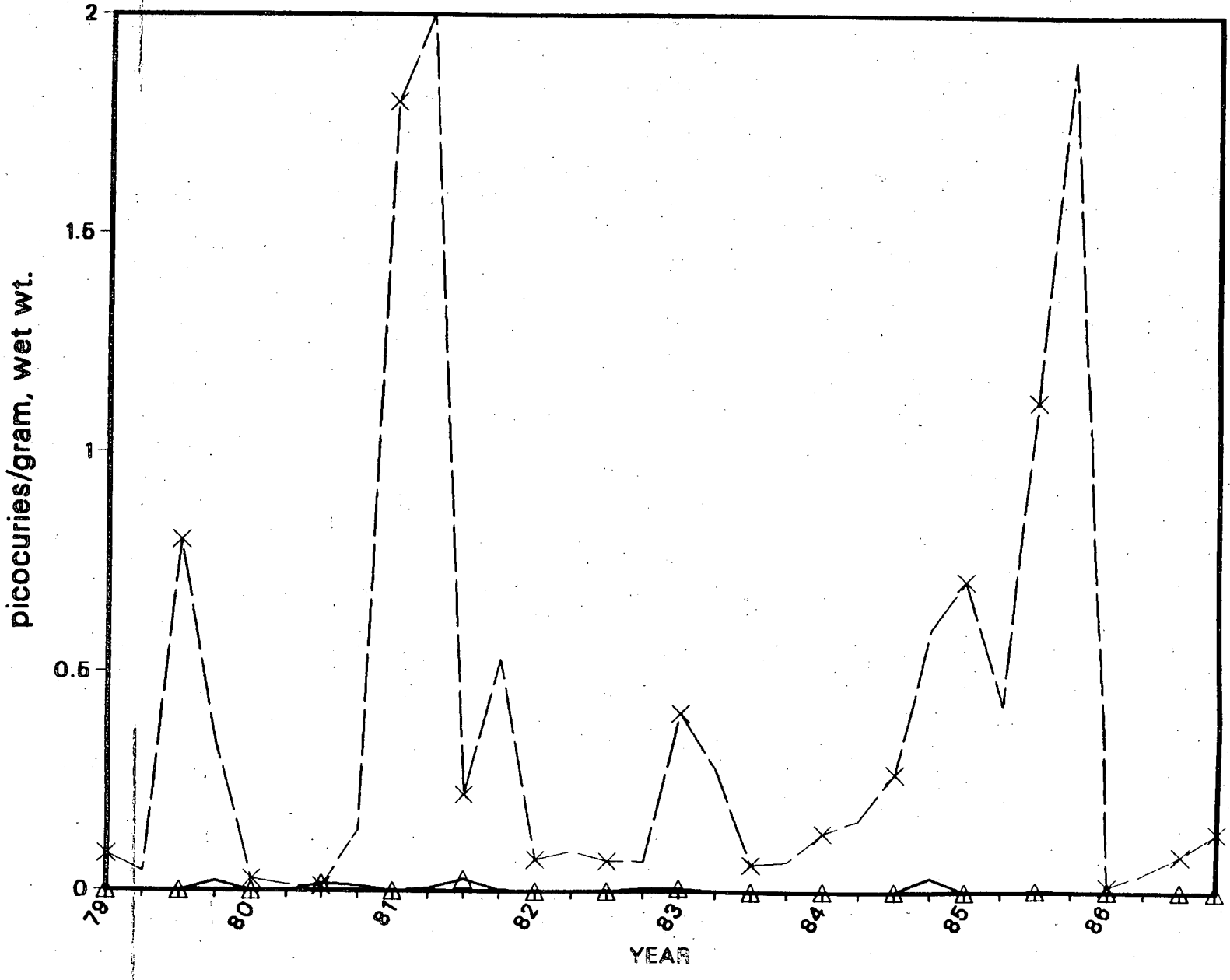

FIGURE 14

CESIUM-137 IN FLESH OF MOLLUSKS
UNIT 1 vs. CONTROL

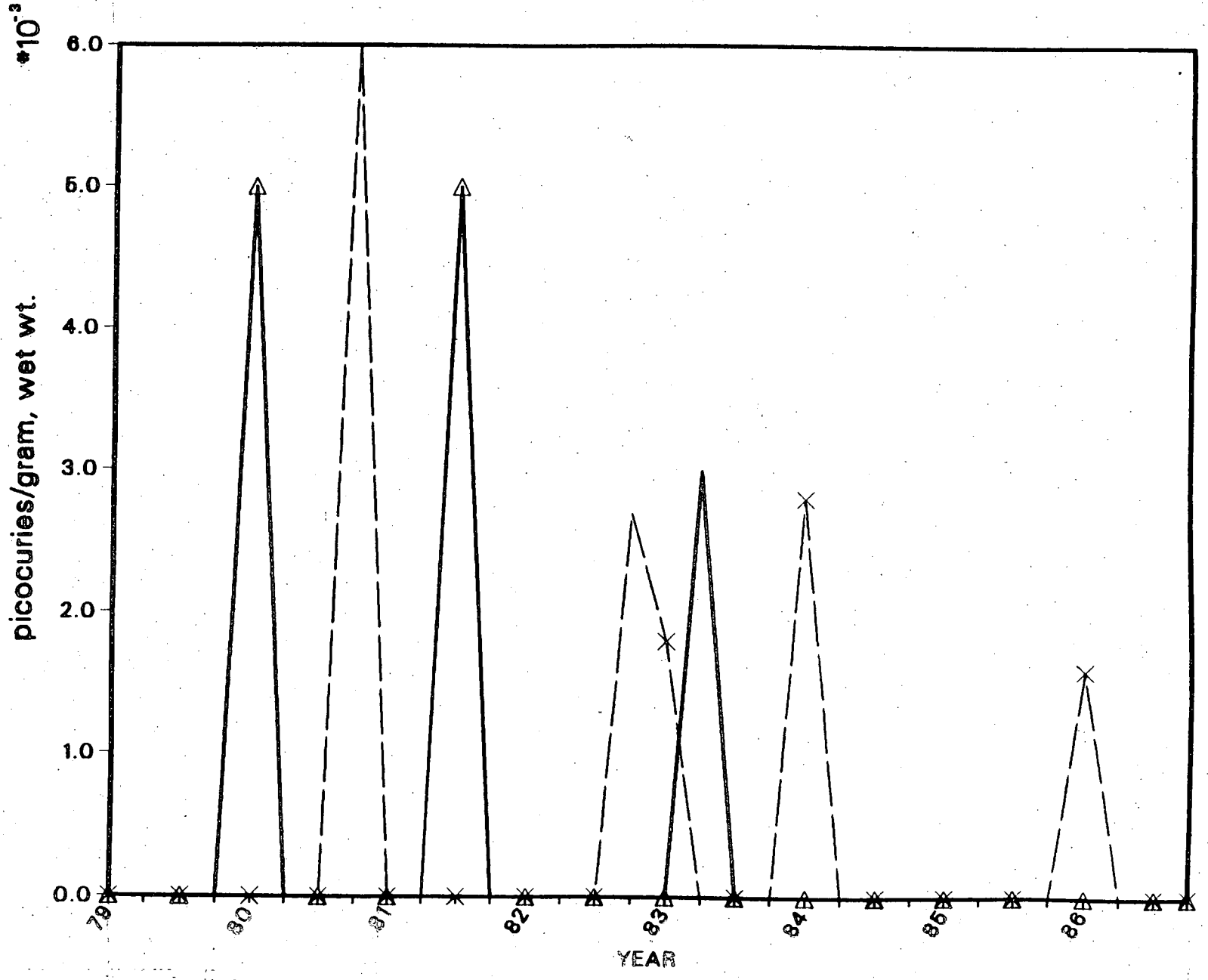

FIGURE 15

COBALT-58 IN OCEAN BOTTOM SEDIMENTS
UNIT I vs. CONTROL

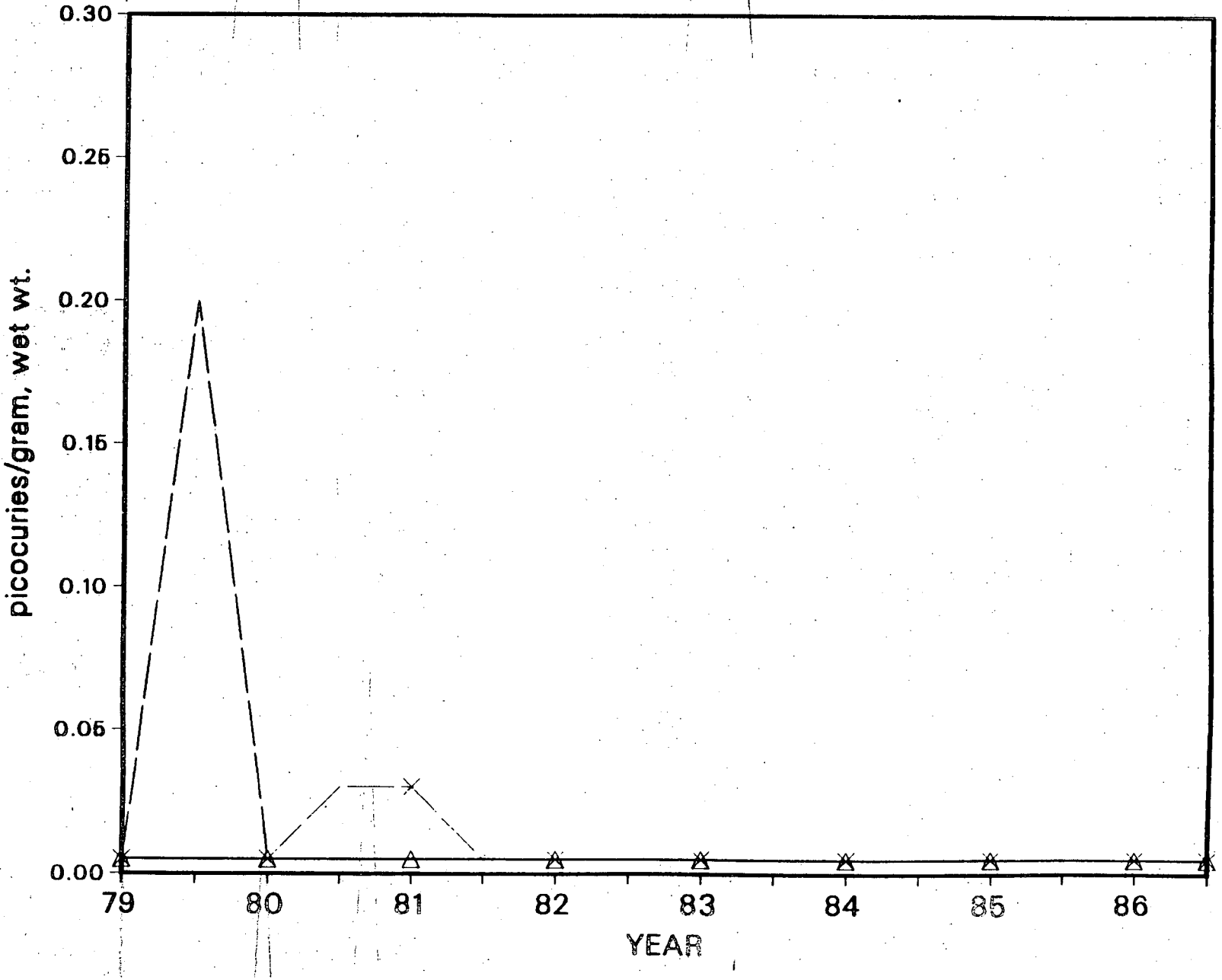

FIGURE 16

COBALT-60 IN OCEAN BOTTOM SEDIMENTS
UNIT 1 vs. CONTROL

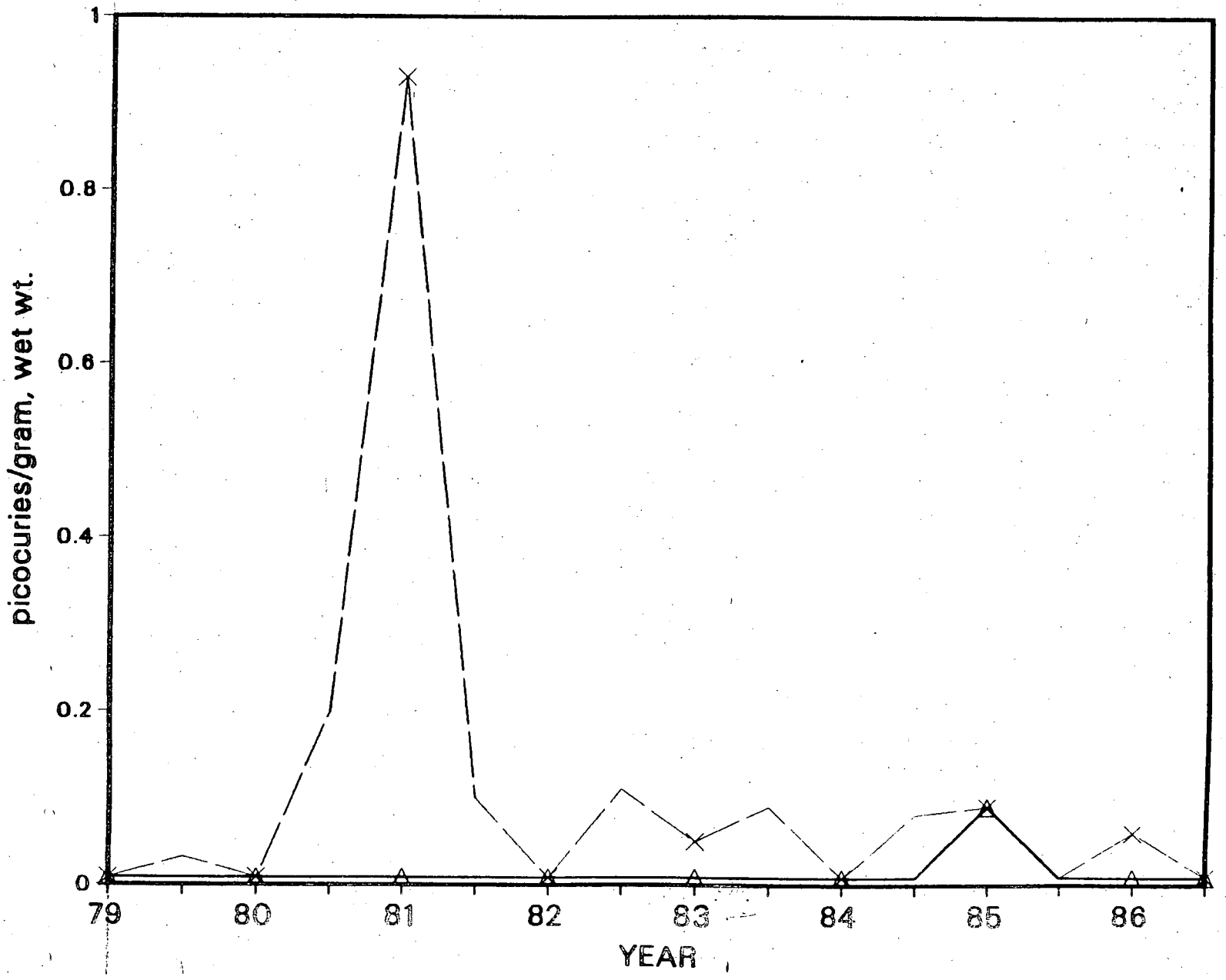

FIGURE 17

SILVER-110m IN OCEAN BOTTOM SEDIMENTS
UNIT 1 vs. CONTROL

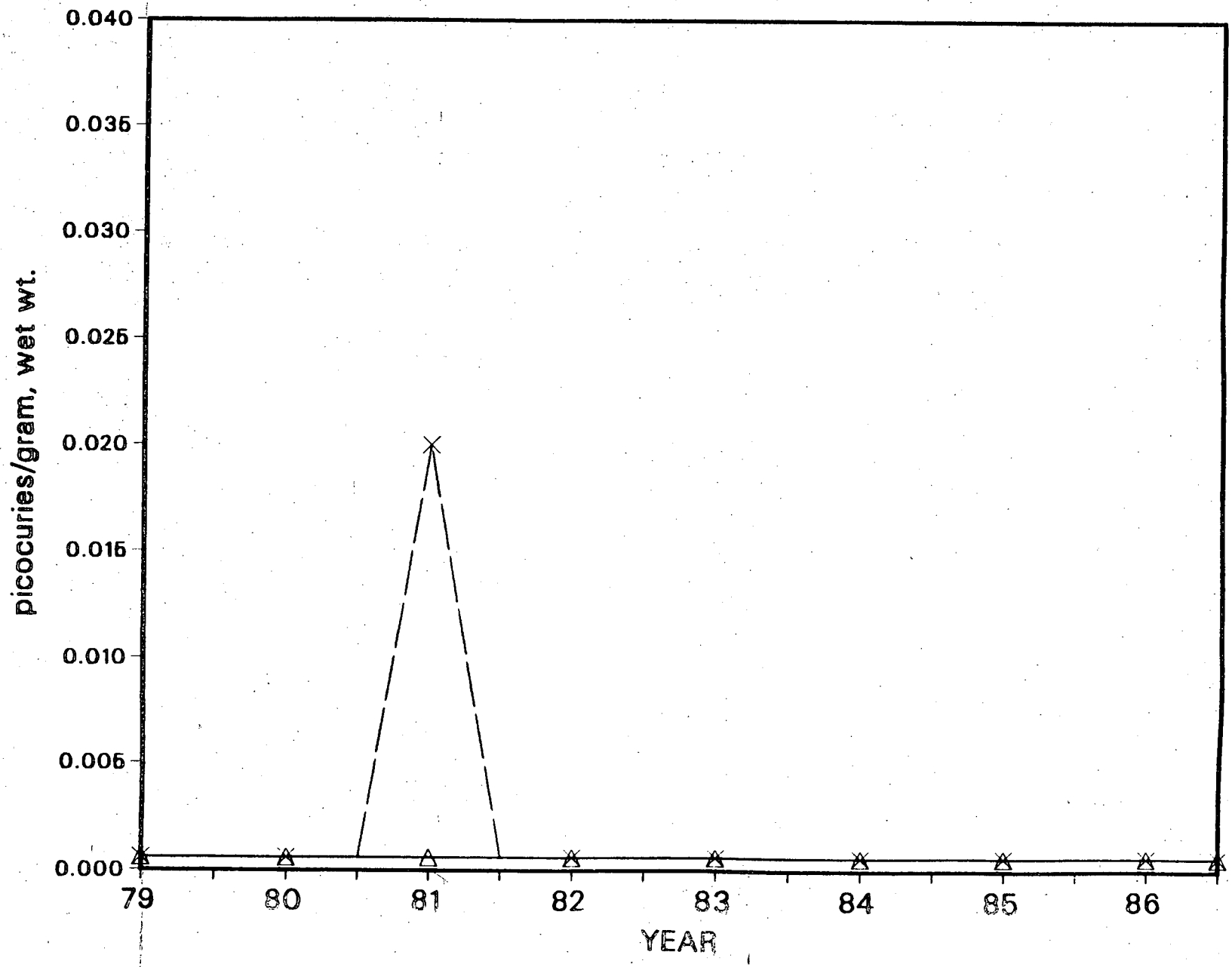

FIGURE 18

CESIUM-137 IN OCEAN BOTTOM SEDIMENTS
UNIT 1 vs. CONTROL

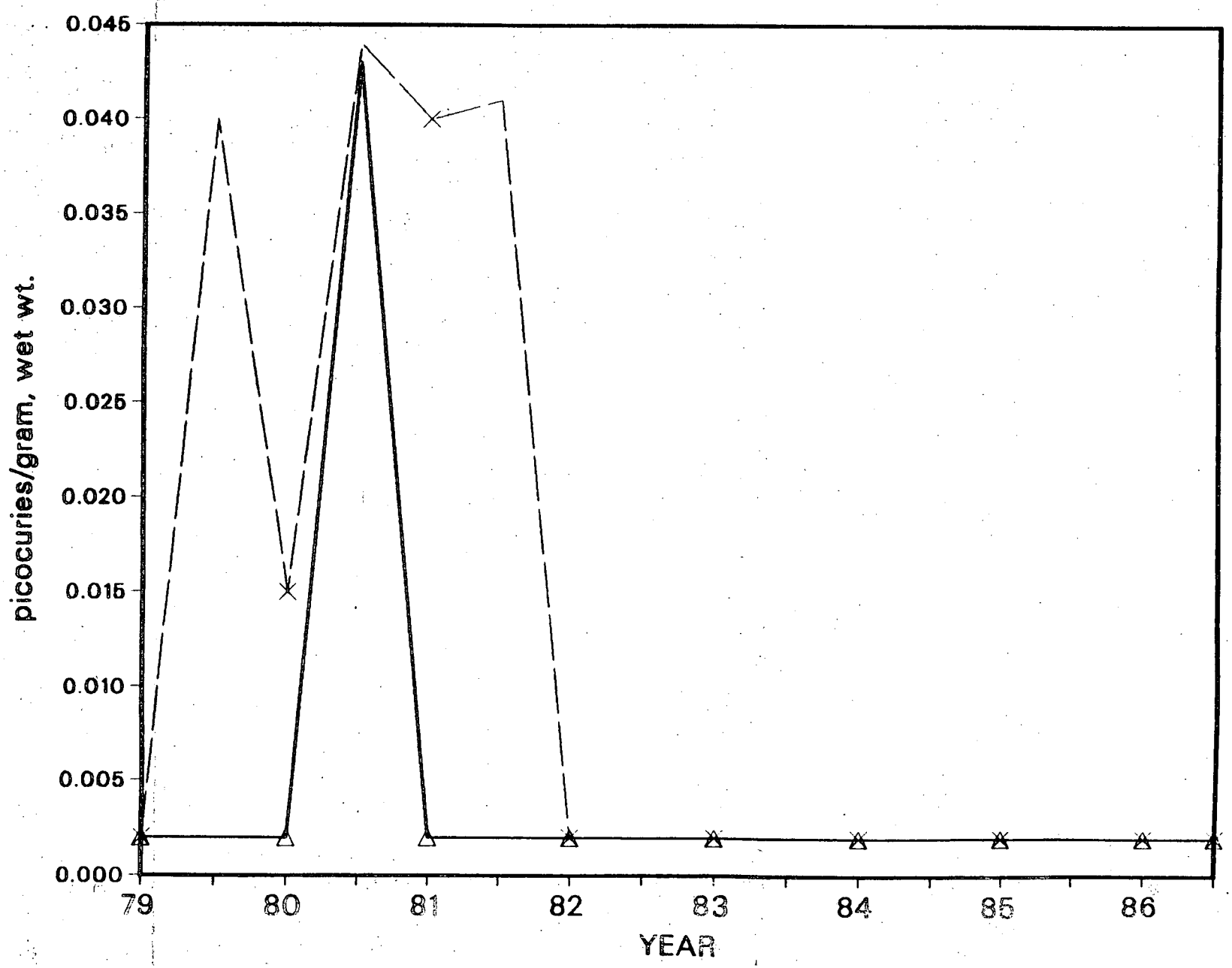

FIGURE 19

DIRECT RADIATION MONITORING
PREOPERATIONAL AND OPERATIONAL DATA

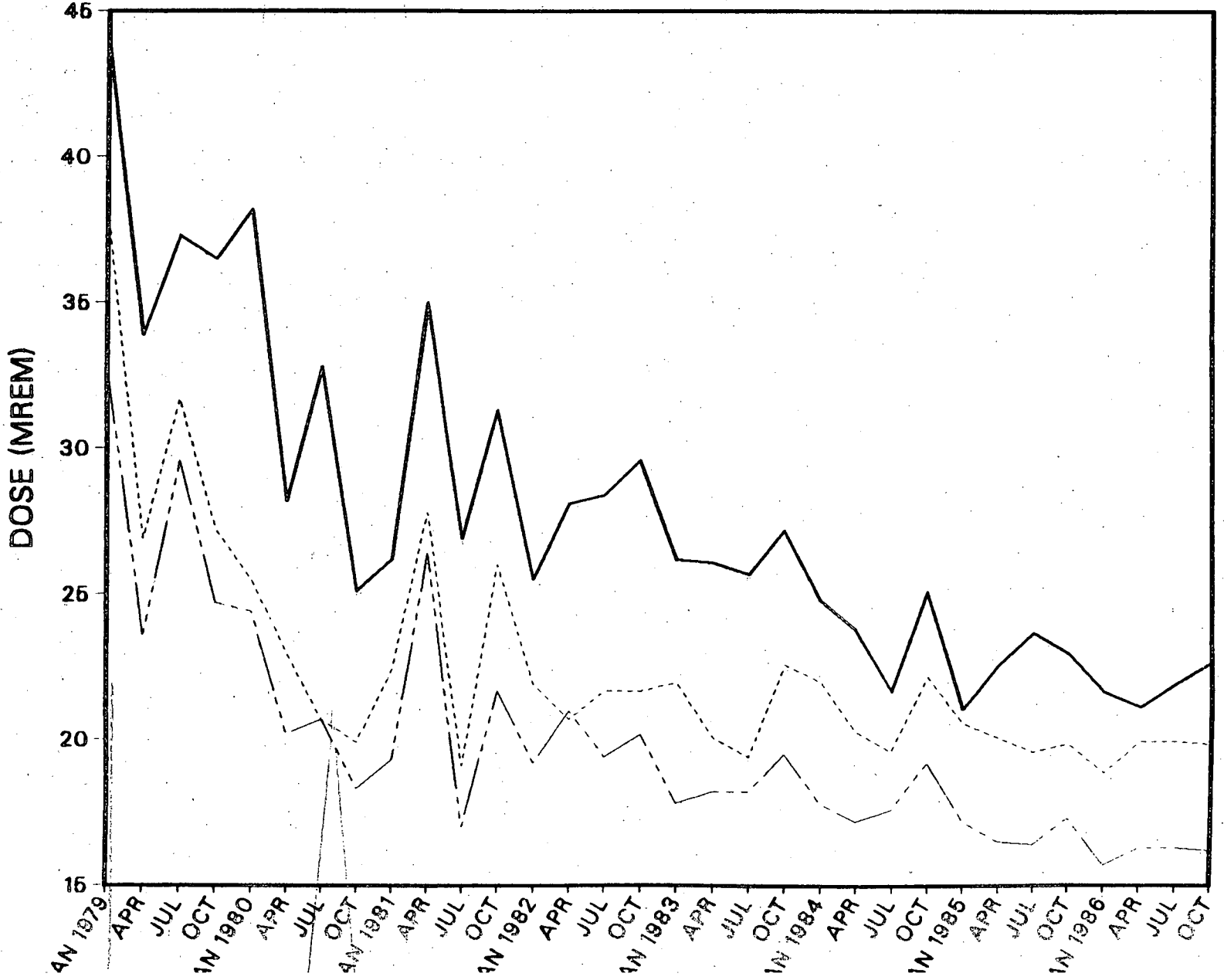

FIGURE 20

Legend

CONTROL

SAN CLEMENTE

ROUTE 101–ESE

DIRECT RADIATION MONITORING
PREOPERATIONAL AND OPERATIONAL DATA

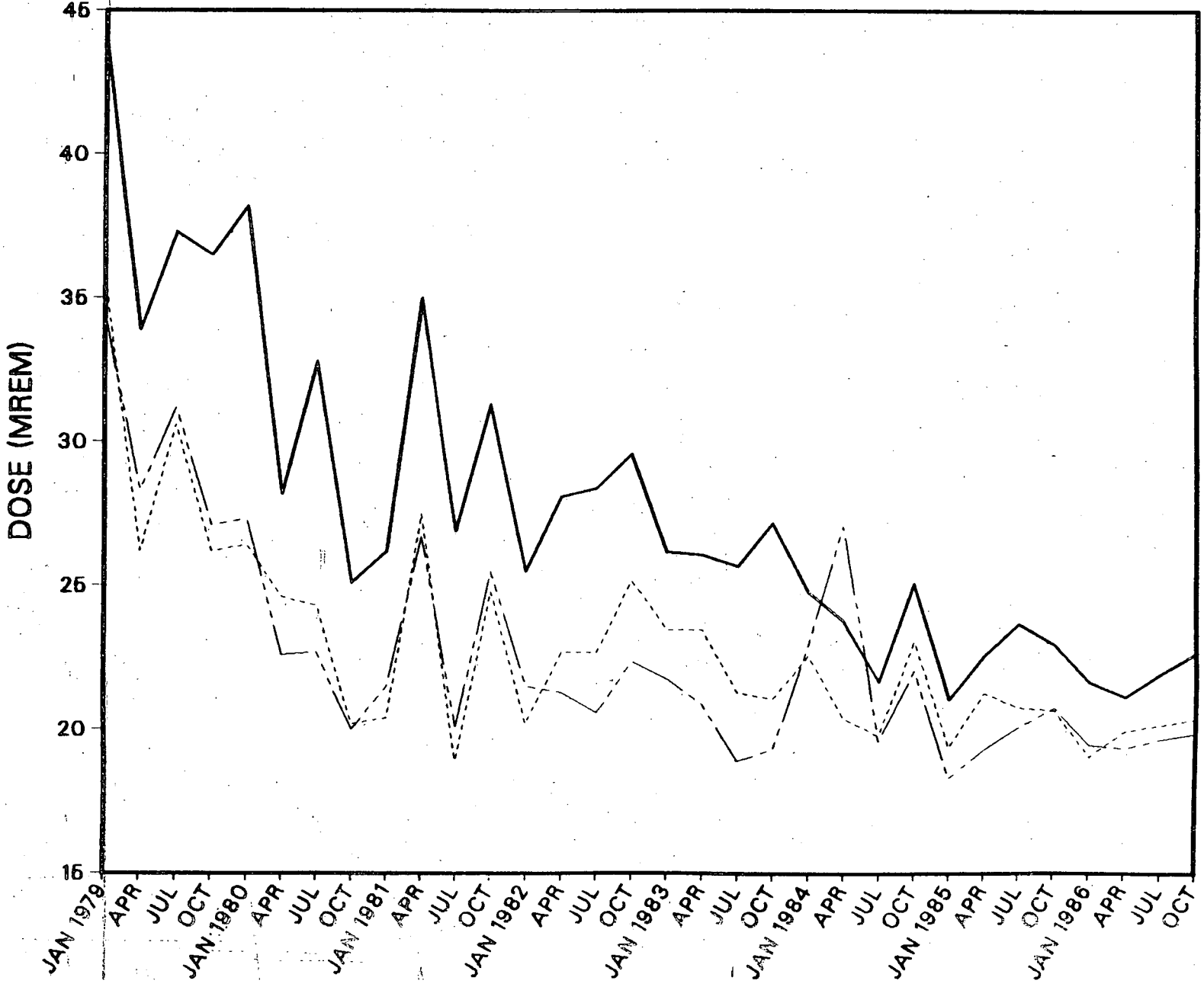

FIGURE 21

Legend
CONTROL
VISITORS CENTER
SWITCHYARD

DIRECT RADIATION MONITORING
PREOPERATIONAL AND OPERATIONAL DATA

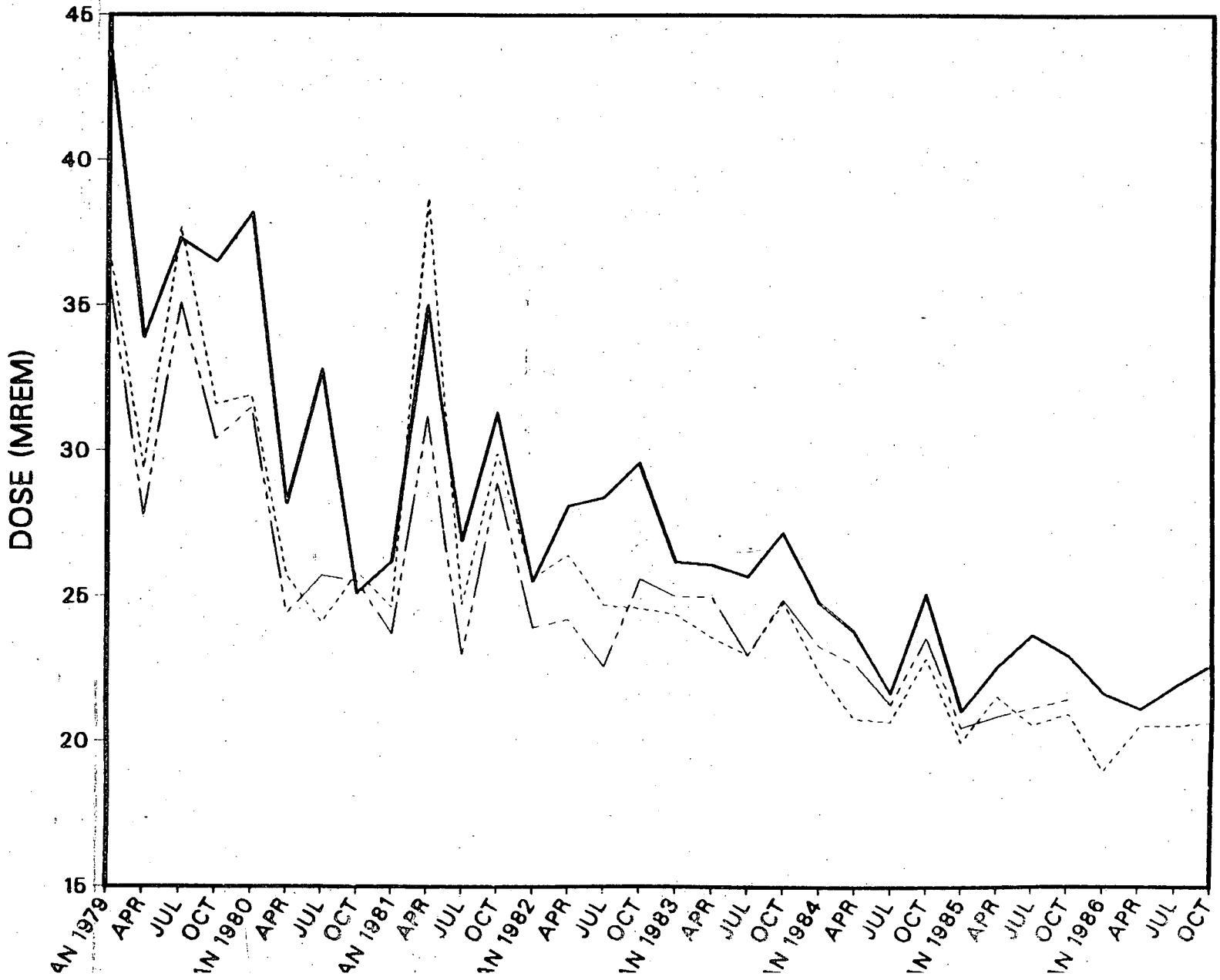

FIGURE 22

Legend

CONTROL

BASILONE RD.

BLUFF

AIRBORNE PARTICULATES GROSS BETA ACTIVITY
PREOPERATIONAL AND OPERATIONAL DATA FOR SONGS UNITS 2/3

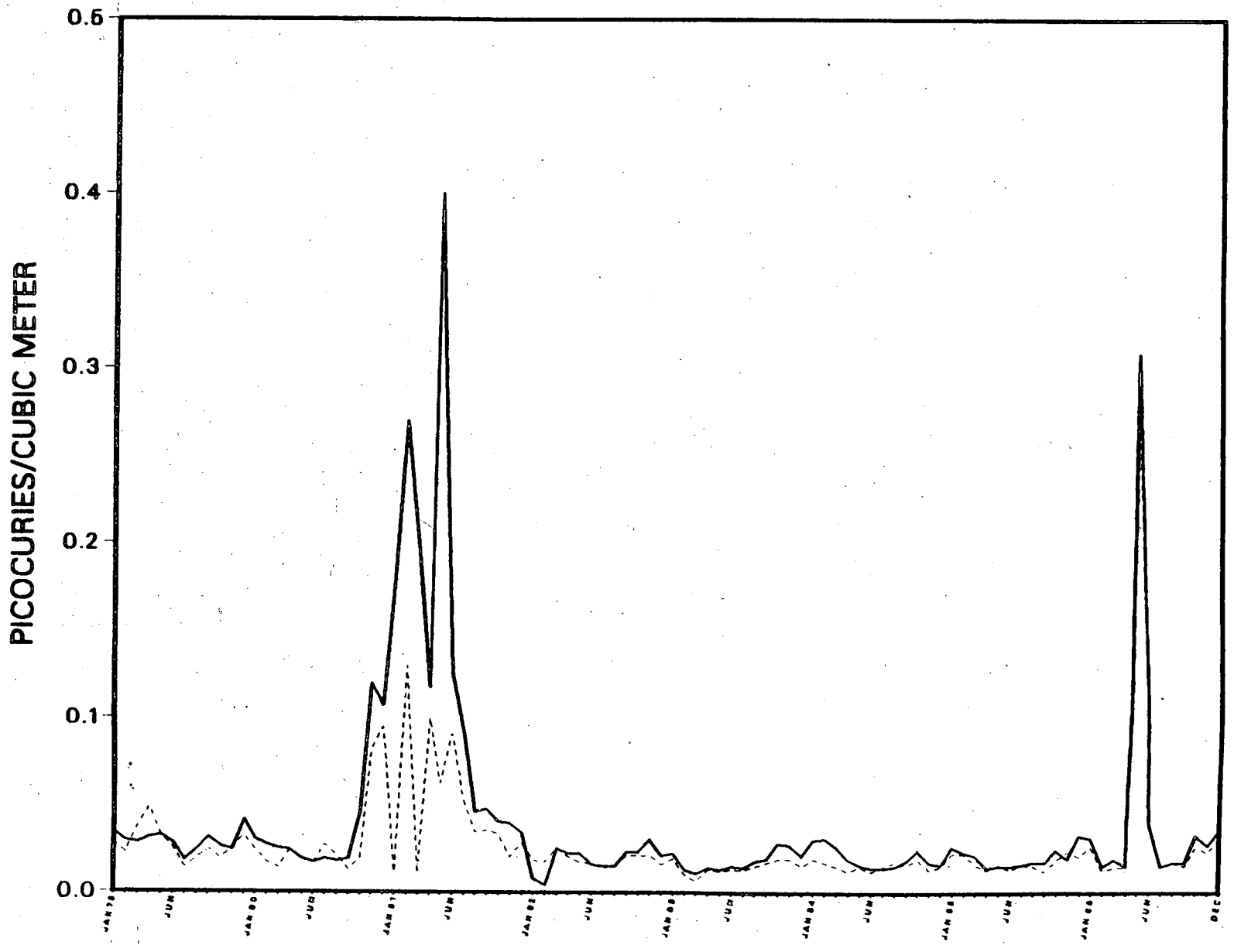

FIGURE 23

Legend
CONTROL
SAN CLEMENTE

AIRBORNE PARTICULATES GROSS BETA ACTIVITY
PREOPERATIONAL AND OPERATIONAL DATA FOR SONGS UNITS 2/3

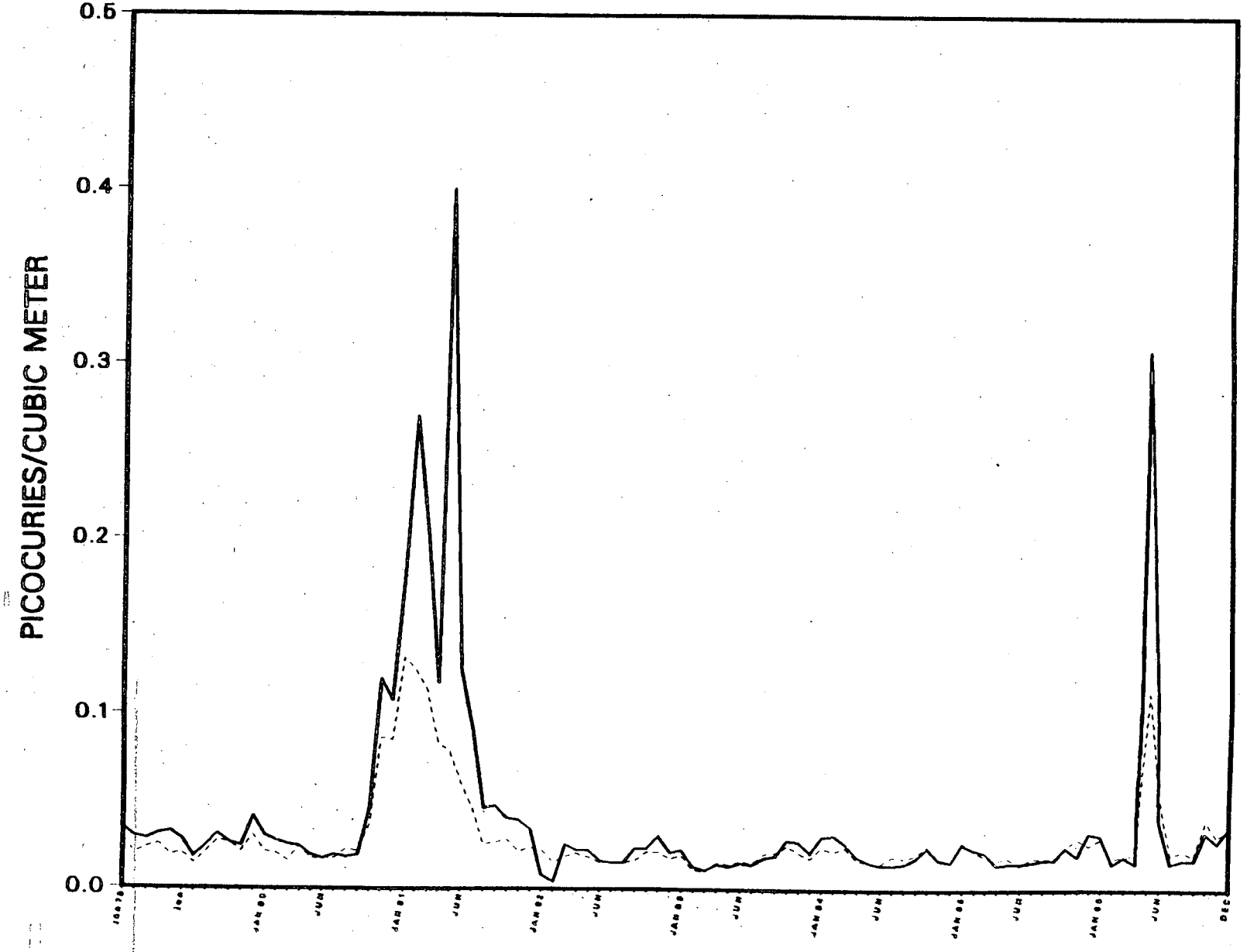

FIGURE 24

Legend
CONTROL
CAMP SAN ONOFRE