LEAD DEPARTMENT
Environmental Protection

Effective date:

Donald W. Martin
Manager, Environmental Protection — 11/9/87 Date

MHS
Director, Quality Assurance — 11/10/87 Date

R W Colombo
Chairperson, PRC — 11-10-87 Date

Paul R. Whitney
Chairperson, MSRC — 11-10-87 Date

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0.0 POLICY

The Sacramento Municipal Utility District (SMUD) and the Rancho Seco Nuclear Generating Station recognize their responsibility to comply with the Technical Specifications and the applicable regulations, codes, standards and industry-wide criteria for establishing and maintaining a viable Radiological Environmental Monitoring Program. We are committed to operating the Rancho Seco Nuclear Generating Station in such a manner that will assure proper radiation protection to all employees, contractors and the general public. To this end, we have committed to performing an environmental sampling program which meets the intent of the applicable regulations while providing an accurate assessment of the radiological environment in and around the environs of the Rancho Seco site.

G. Carl Andognini,
Chief Executive Officer, Nuclear

1.0 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM BASES

The Rancho Seco Unit One Technical Specifications, Section 4.26, state in part that:

> "The Radiological Environmental Monitoring Program required by this specification provides measurements of radiation and radioactive materials in those exposure pathways and for those radionuclides which lead to the highest potential radiation exposures of individuals resulting from station operation. This monitoring program thereby supplements the radiological effluent monitoring program by verifying that the measurable concentrations of radioactive materials and levels of radiation are not higher than expected."

The Sacramento Municipal Utility District and the Rancho Seco Nuclear Generating Station, to ensure that this requirement is met, have instituted a Radiological Environmental Monitoring Program (REMP) which this manual serves to implement. The REMP is based upon the guidelines of Title 10 of the Code of Federal Regulations, Part 20, Section 106 (10 CFR 20.106). That Regulatory basis and associated guidelines have been the foundation of the REMP and its programmatic elements which:

1. Provide the technological basis of, and the instruction for, monitoring the site and environs for radioactivity of all sources, including;

   a. naturally occurring background
   b. releases during normal operations
   c. operational occurances and postulated accidents
   d. weapons testing and major nuclear accidents which contribute to detectable radioactivity in the environs.

2. Provide the means to verify the effluent control program of the Rancho Seco Nuclear Generating Station.

3. Meet minimum limits for detecting radioactive elements in samples collected from the environs, or direct measurements in the field.

4. Provide measurements of radiation and radioactive materials in those exposure pathways, i.e., liquid,

gaseous, and direct radiation, and for those radionuclides, i.e., iodine, cesium, and cobalt, which lead to the highest potential radiation exposure of individuals resulting from station operation.

2.0 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM DESCRIPTION

The Radiological Environmental Monitoring Program is under the cognizance of the Chief Executive Officer, Nuclear, with the responsibility for the administration and oversight of the program assigned to the Manager, Environmental Protection.

The design of the program is consistent with the intent of Title 10 Code of Federal Regulations, Part 20, Section 106, "Standards for Protection Against Radiation". To implement these requirements, the Technical Specifications, Offsite Dose Calculation Manual and Health Physics Implementation Procedures have been developed. The implementing procedures address specific areas of emphasis in the program that require direct attention and/or specified step-wise progress for completion. The following is a list of those types and numbers of those documents used for the implementation of the REMP:

Radiological Effluent Technical Specification, Appendix A, Sections 3.22, 3.22-1, 3.22-2, 3.23, 3.25, 3.26, 4.26, 4.26-1, 4.27, 4.29, 6.5.1.8.b,c,d,k,n, 6.9.2, 6.9.5.

Offsite Dose Calculation Manual.

Health Physics Implementing Procedures listed below;

HPIP.2001 Radiological Environmental Monitoring Operations,

HPIP.2010 Training and Qualification of Radiological Environmental Personnel,

HPIP.2021 Interlaboratory Comparison of Radiological Environmental Monitoring Analysis,

HPIP.2025 Quality Review of the Radiological Environmental TLD System,

HPIP.2040 Radiological Environmental Trend Analysis,

HPIP.2050 Radiological Environmental Reports,

HPIP.2051 Annual Radiological Environmental Operating Reports,

HPIP.2060 Radiological Environmental Records and Documentation,

HPIP.2080 Radiological Environmental Surveillances,

HPIP.2130 Preparations Prior to Performing Environmental Sampling,

HPIP.2131 Handling and Preparations of Radiological Environmental Samples for Shipment,

HPIP.2140 Land Use Census,

HPIP.2201 Sampling of Water for Radiological Environmental Monitoring,

HPIP.2260 Preparation of the ISCO Composite Water Sampler for Use,

HPIP.2261 Inspection and Maintenance of the ISCO Composite Water Sampler,

HPIP.2310 Algae Sampling for Radiological Environmental Monitoring,

HPIP.2401 Airborne Radiological Environmental Monitoring,

HPIP.2501 Terrestrial Sampling for Radiological Environmental Monitoring,

HPIP.2610 Posting and Retrieval of Environmental Thermoluminescent Dosimeters,

HPIP.2611 Analysis of Thermoluminescent Dosimeter Data,

HPIP.2630 Irradiation of Test and Calibration Thermoluminescent Dosimeters,

HPIP.2631 Acceptance Criteria and Periodic Testing of Environmental Thermoluminescent Dosimeters,

HPIP.2650 Operation of the UD-702 Panasonic Themoluminescent Dosimetry Reader,

HPIP.2651 Calibration of the UD-702 Panasonic Thermoluminescent Dosimetry Reader,

HPIP.2652 Maintenance of the UD-702 Panasonic Thermoluminescent Dosimetry Reader,

HPIP.2710 Sampling of Milk for Radiological Environmental Monitoring,

HPIP.2720 Sampling of Aquatic Life For Radiological Environmental Monitoring,

HPIP.2730 Sampling of Botanical Specimens for Radiological Environmental Monitoring,

HPIP.2740 Sampling of Animal Tissues for Radiological Environmental Monitoring,

HPIP.2750 Sampling of Honey for Radiological Environmental Monitoring.

Several documents that were used as guidance, but were not necessarily strictly adhered to as absolute standards, during the developmental phases of the program are:

American National Standards Institute Standard ANSI N545-1975, Performance, Testing and Procedural Specifications for Thermoluminescence Dosimetry (Environmental Applications),

ANI/MAELU Information Bulletin 86-1,

Regulatory Guide 4.1 Programs for Monitoring Radioactivity in the Environs of Nuclear Power Plants,

Regulatory Guide 4.15, Rev. 1, 1979, Quality Assurance for Radiological Monitoring Programs (Normal Operations) - Effluent Streams and the Environment.

NUREG-0472, Rev. 2, Radiological Effluent Technical Specifications for PWR's, July 1979,

NUREG 0543, Methods for Demonstrating LWR Compliance with the EPA Uranium Fuel Cycle Standard (40 CFR Part 190),

Branch Technical Position, Rev. 1, November 1979,

NCRP Report No. 50 - Environmental Radiation Measurements.

2.1 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM PARAMETERS

The monitoring and sampling aspects of the program have been established after three major factors were determined, which are:

Identification of the effluent release pathways,

Identification of the human exposure pathways,

Identification of the land usage parameters by the population within a ten mile radius of the site.

Three principal release pathways exist at Rancho Seco Nuclear Generating Station, which are:

Gaseous Effluents discharges from the waste gas system for the reactor building stack, auxiliary building stack, miscellaneous water evaporator stack and the auxiliary grade level vent.

Liquid Effluents discharges which are released from the retention basins via the waste water disposal system [regenerant hold up tanks (RHUT) A and B].

Direct Radiation radiation that emanates from radioactive material contained within tanks or other containers which are within the site boundary to humans outside of the site boundary.

The pathways to human exposure to radioactive materials in the effluent release pathways from Rancho Seco are:

Gaseous

- Inhalation of airborne radioactive material by humans, or by animals that inhale and retain the material in animal products eaten by the public, i.e. meat or milk.
- Consumption of radioactive particulate material which, although carried by air

currents, is deposited onto or is taken up by water sources or plants consumed by humans, or by animals that provide products that are consumed by humans, i.e. milk or meat.

- Exposure from being immersed in air containing radioactive materials as a gas and/or particulates.

- Exposure to the direct radiation from radioactive materials that have been deposited onto surfaces from airborne releases.

Liquid — Drinking of water from the release pathway by humans, or by animals that are a food source for humans.

- The consumption of fish, shellfish or other animals that have eaten fish or shellfish taken from water within the liquid release pathway.

- The consumption of animal meats or products of animals that have eaten vegetation that have been irrigated with water from the release pathway.

- The consumption by humans of fruit or vegetation grown in soil irrigated with water from the release pathway.

Direct Radiation — The exposure to radiation emitted from radioactive materials within the Rancho Seco sire boundary. Sources include, but are not limited to, the Borated Water Storage Tank, Reactor Coolant Storage Tank, and the Radioactive Waste Storage Area.

- The Exposure from being immersed in the release pathway water, to radiation emanating from material contained in the water.

2.2 ANALYSIS OF EXPOSURE PATHWAYS

Exposure pathways are analyzed through a systematic process which identifies a sample medium or organism that is found in the effluent pathways, for which usage factors can be determined and will suitably represent biological concentration, retention or uptake which may ultimately represent a contribution to human exposure. The pathways to human exposure are evaluated through the analysis of data obtained from the performance of a land use census. The performance of the land use census is required by the Technical Specifications Section 4.27. The analysis of the effluent and exposure pathways enables the selection of sampling and monitoring locations that fall into one of two classes, those which are, and those which are not, influenced by effluent pathways. Those in the pathways are referred to as indicator locations. Several of the unaffected locations are selected to represent baseline or control locations.

Indicator locations provide data from the surrounding environment that may be influenced by the operation of the plant because they are nearby, downwind or downstream in the release pathway. Such data can be used to calculate doses to humans to verify the degree of compliance with 40 CFR 190, using methodology contained in the ODCM. (This is referred to as the Real Individual Exposure. The Real Individual is defined as any person who participates in activities that result in that person being in the actual pathways for offsite dose. A Real Individual who, based upon the land use census, is expected to receive the maximum offsite dose to real individuals, may be used to calculate doses to demonstrate compliance with 40 CFR 190).

Control sample locations are to provide data that should not be influenced by the operations of Rancho Seco. These locations are selected based upon the distance from the plant, being upwind, or upstream of the release pathways. Data from these locations help discriminate between Rancho Seco releases and other natural or manmade events that may impact human exposure.

At Rancho Seco, potentially radioactive liquid effluent is discharged into Clay Creek. Continuously, a minimum flow of 5000 gallons per minute of non-radioactive water is released above the discharge point. The continuous minimum flow and the liquid radioactive effluent release are the major effluent release pathway, and hence exposure pathway for the

station during normal operations. Prior to the minimum release rate being established, Clay Creek was a seasonal stream, formed as the confluence of three and one half square miles of drainage runoff upstream of the site. The now continuous flow of Clay Creek intersects Hadselville Creek North and West of California State Highway 104. Hadselville Creek intersects Laguna Creek just East of the Folsom Canal. Laguna Creek flows into the Consumnes River approximately 20 miles from Rancho Seco. Hadselville and Laguna Creeks are also seasonal streams and also receive irrigation runoff during periods when irrigation is used. Because these streams are the major release pathway for liquid effluents from the site, the majority of recent program enhancements have focused on this effluent pathway. The gaseous pathway analysis is also related to the land use census. This pathway is not confined by creek banks, but is subject of the meteorological conditions during the time of the release. This presents the requirements of having indicator and control sampling stations more evenly distributed with particular attention to those areas of greater population density. While not the major release nor exposure pathway, recent improvements in monitoring this pathway have been instituted.

The direct radiation exposure pathway is the least likely pathway for the exposure to plant radiation by humans. It is the most easily measured with the use of thermoluminescence dosimeters, which monitor continuously and passively. The dose is integrated over three months to accumulate a statistically significant exposure. The vast majority of the dose integrated by these detectors is delivered from primordial elements in the geological surface of the Earth, which happen to contain naturally radioactive elements. A smaller fraction of the dose is delivered by cosmic radiation which has penetrated the Earth's atmosphere.

2.3 IDENTIFICATION OF SAMPLING AND MONITORING SITES AND SAMPLES

Sampling and monitoring sites and the samples collected from them, must be identified with a concise designation. This has been accomplished using the following methodology:

To establish the Utility identification, the letter "R" has been chosen. Therefore all samples from the Rancho Seco begin with the letter "R".

Next, that portion of the identification related to the type of sample is made with a two letter designation,

i.e., AS = Air Sample. A complete list is contained in Table 1.

A group of digits follows the Sample type. These indicate the straight-line distance from the center of containment. For distances less than ten miles, the figure is to the nearest tenth of one mile. For distances ten or more miles the figure is to the nearest mile. Distances are measured with the use of U.S. Geodetic Survey maps.

Following that is a letter designation which specifies the identification letter corresponding with one of the 16 wind sectors as identified in the Emergency Response Plan, i.e., "H". Emergency Response Plan Wind Sectors are defined in Table 2.

The final character is the letter "O" which designates the sample as being one collected after the plant was declared operational.

Thus, a Rancho Seco Air Sample, collected at ten miles from the plant in Emergency Plan Wind Sector "H" after operational status was established would be identified as:

RAS10HO.

To complete the identification process, each sample label has a date as part of the sample number, followed by 24 hour time, written as:

MM/DD/YYYY-HHmm,

or specifically, if the sample was collected in December, on the 15th day in 1987 at 5:15PM, then the above sample would be identified as:

RAS10HO-12/15/1988-1715.

The present system of identification has been incorporated in preference to the system originally used to identify samples and sites. There is a necessity to retain the ability to identify, and continue to use data from, previously collected samples. The former identification designation is shown in parenthesis under the currently used one.

2.4 REPORTING RESULTS OF RADIOLOGICAL ENVIRONMENTAL DATA

The requirements for reporting radiological environmental data are specified in the Technical Specifications, Section 6.9.2, Environmental Reports. Those subsections which require supporting data from the Radiological Environmental Monitoring Program Address the Annual Radiological Environmental Operating Report and the Semi-annual Radioactive Effluent Release Report. Technical Specification Section 6.9.5, Special Reports, is made specific in HPIP 2050, Radiological Environmental Reports. Specified therein are conditions requiring special reports, and reporting requirements in days for submittal. This includes those calculations to provide rapid assurance of the degree of compliance with 10CFR50 Appendix I, and 40CFR190 calculations after releases of any origin.

2.5 SELECTION OF RADIOLOGICAL ENVIRONMENTAL MONITORING LOCATIONS

In conjunction with the data base established from the land use census, the requirements of the Technical Specifications, and the guidance described in Section 2.0 of this Manual, the selection of sampling and monitoring sites was performed. These were chosen to provide for at least the minimum number of indicator locations specified in Technical Specifications, Section 3.22, Table 3.22-1.

For those locations to be classified as indicator sites, data is gathered from the land use census, Lawrence Livermore National Laboratory Rancho Seco Study Reports, Oak Ridge National Laboratory Study Reports, and from additional sampling sites from which materials have been collected and determined to be candidate sites. Presently, a sufficient number of control sites have been selected and are not anticipated to be increased in number.

Environmental themoluminescence dosimeters are placed more uniformly around the environs of the site. These devices passively monitor radiation in the immediate environs. Data from TLDs is trended to establish variations which are influenced by seasonal, meteorological, local and global sources. TLDs will also respond to radiation in the effluents of the plant if they pass in near proximity. The TLD Program is operated entirely by Rancho Seco. The data is included in each Quarterly Environmental Report.

Sample locations for the collection of the flora and fauna are concentrated in the liquid effluent pathway to the West. Representative samples of all the pathways and suitable locations are established in all directions. Air samplers are distributed to achieve a sampling of air from major wind directions across the site.

The Radiological Environmental Monitoring Program maintains at least those minimum sampling locations and type of samples as required to meet the Technical Specification requirements listed in Table 3.22-1. Many sample types and locations have been added to enhance characterizing the radiological environmental impact of Plant operations. The increased sample locations and types in this manual, will be will be maintained unless it is determined that they are no longer useful or necessary data sites. The number and type will not be reduced below those stated in T.S. 3.22-1.

Two special sites that have been established are vegetable gardens maintained by site personnel. One is established at the site boundary alongside the Clay Creek, and irrigated with water from the effluent stream. These data are considered essential for comparisons to vegetation not irrigated with effluent stream water for determination of bioaccumulation for soil types common to the environs. The second garden is at the North of the site, and is irrigated with domestic water. Washed vegetable from this sight will be compared to the site boundary washed vegetables for the comparison studies. Unwashed Samples will be taken from this garden to evaluate possible airborne materials to the North of the site via the gaseous effluent exposure pathway.

All of the locations selected for the Radiological Environmental Monitoring Program, present and future, are designated in Table 3 for environmental samples. Health Physics Implementing Procedure HPIP.2001, Radiological Environmental Monitoring Operations, contains detailed maps on which the sampling and monitoring locations are marked.

Table 4 lists the locations selected for the environmental thermoluminescence dosimeters. HPIP.2001 Radiological Environmental Monitoring Operations, contains detailed maps on which the sampling and monitoring locations are marked.

TABLE 1

TWO LETTER DESIGNATION TO IDENTIFY THE TYPE OF SAMPLE

LETTER DESIGNATION	TYPE OF SAMPLE REPRESENTED
AS	Air Sample
RW	Runoff Water
SW	Surface Water
DW	Drinking Water
WW	Well Water
MS	Mud and Silt
MF	Milk Sample (Cow)
RB	Rabbit
SL	Soil
HS	Honey Sample
BF	Beef Tissue
BT	Beef Thyroid
FS	Fish Sample
LV	Garden Vegetation
AG	Algae Sample
PV	Pasturage
TL	Thermoluminescense Dosimetry
SG	Small Game
FG	Frog
CF	Crawfish
PH	Pheasant
DU	Duck
RI	Rice

Additional letter designation may be added as sample designators if additional sample types are collected for analysis.

TABLE 2

SECTOR LETTER DESIGNATIONS USED IN SAMPLE IDENTIFICATION

SECTOR LETTER	SECTOR DEGREES AND TRUE NORTH COMPASS SECTOR	
A	348.75 TO 11.25	N
B	11.25 TO 33.75	NNE
C	33.75 TO 56.25	NE
D	56.25 TO 78.75	ENE
E	78.75 TO 101.25	E
F	101.25 TO 123.75	ESE
G	123.75 TO 146.25	SE
H	146.25 TO 168.75	SSE
J	168.75 TO 191.25	S
K	191.25 TO 213.75	SSW
L	213.75 TO 236.25	SW
M	236.25 TO 258.75	WSW
N	258.75 TO 281.25	W
P	281.25 TO 303.75	WNW
Q	303.75 TO 326.25	NW
R	326.25 TO 348.75	NNW

The letters "I" and "O" are not utilized. This reduces the chances for mistaking them as numbers one and zero respectively.

TABLE 3

RADIOLOGICAL ENVIRONMENTAL SAMPLING LOCATIONS

SAMPLE TYPE IDENTIFICATION (OLD ID#)	SAMPLE CLASS	COLLECTION FREQUENCY	DESCRIPTION OF LOCATION Location Name/	Degrees/Mi
AIR SAMPLES				
RAS0.1CO (RAHO)	IND	Weekly	On Site	/ 54 /0.1
RAS0.6KO (RADO)	IND	Weekly	Tokay Substation	/192 /0.6
RAS6.2QO (RAAO)	IND	Weekly	Miller Residence	/310 /6.2
RAS7.8CO (RAFO)	IND	Weekly	Carbondale	/ 53 /7.8
RAS9.0EO (RAEO)	IND	Weekly	Ione	/ 88 /9.0
RAS10.HO (RAGO)	CON	Weekly	Fish Hatchery	/149 /10.
RAS18.KO (RACO)	CON	Weekly	Lodi Substation	/212 /18.
RAS23.QO (RABO)	CON	Weekly	SMUD Headquarters	/315 /23.
MILK SAMPLES				
RMF0.8DO (RMFDO)	IND	Weekly	Marciel Ranch	/ 75 /0.8
RMF5.8PO (RMFAO)	IND	Weekly	Mederios Dairy	/298 /5.8
RMF8.2KO (RMFBO)	IND	Weekly	Angelo Dairy	/204 /8.2

RADIOLOGICAL ENVIRONMENTAL SAMPLING LOCATIONS

SAMPLE TYPE IDENTIFICATION (OLD ID#)	SAMPLE CLASS	COLLECTION FREQUENCY	DESCRIPTION OF LOCATION Location Name/	Degrees/Mi
RMF10.NO (RMFBO)	IND	Weekly	Warmerdam Dairy	/260 /10.
RUNOFF WATER				
RRW0.3MO (RRWCO)	IND	Biweekly	Effluent Discharge	/250 /0.3
RRW0.6MO (NEW)	IND	Biweekly	Site Boundary	/255 /0.6
SURFACE WATER				
RSW0.7NO (NEW)	IND	Monthly	Water Sump	/265 /0.7
RSW1.3FO (RSWCO)	IND	Monthly	Rancho Seco Reserv.	/104 /1.3
RSW3.7NO (RSWBO)	CON	Monthly	Folsom South Canal	/262 /3.7
RSW12.GO (RSWAO)	CON	Monthly	Camanche Reservoir	/130 /12.
DRINKING WATER				
RDW0.1GO (RWWCO)	IND	Monthly	Rancho Seco Site	/NA /0.1
RAIN WATER				
RRN0.8DO (NEW)	IND	Seasonal	Marciel Ranch	/ 75 /0.8
RRN23.KO (NEW)	CON	Seasonal	SMUD Headquarters	/315 /23

RADIOLOGICAL ENVIRONMENTAL SAMPLING LOCATIONS

SAMPLE TYPE IDENTIFICATION (OLD ID#)	SAMPLE CLASS	COLLECTION FREQUENCY	DESCRIPTION OF LOCATION Location Name/ Degrees/Mi	
PASTURAGE				
RPV0.6MO (NEW)	IND	Monthly	Site Boundary	/255 /0.6
RPV0.8NO (NEW)	IND	Monthly	Silva Property	/260 /0.8
RPV0.8DO (RLVHO)	IND	Monthly	Marciel Ranch	/ 75 /0.8
RPV1.5NO (NEW)	IND	Monthly	Silva Property	/264 /1.5
RPV1.8NO (NEW)	IND	Monthly	Silva Property	/268 /1.8
RPV5.8PO (RLVFO)	IND	Monthly	Mederios Dairy	/298 /5.8
RPV8.2KO (RLVGO)	IND	Monthly	Angelo Dairy	/204 /8.2
RPV10.NO (RLVEO)	IND	Monthly	Warmerdam Dairy	/260 /10.
WELL WATER				
RWW0.1GO (RWWAO)	IND	Quarterly	Site Well	/138 /0.1
RWW0.8DO (NEW)	CON	Quarterly	Marciel Ranch	/ 75 /0.8
RWW0.8LO (RWWEO)	IND	Quarterly	Clay Cattle Feedlot	/215 /0.8
RWW1.6GO (NEW)	IND	Quarterly	Rancho Seco Reserv	/120 /1.6

RADIOLOGICAL ENVIRONMENTAL SAMPLING LOCATIONS

SAMPLE TYPE IDENTIFICATION (OLD ID#)	SAMPLE CLASS	COLLECTION FREQUENCY	DESCRIPTION OF LOCATION Location Name/ Degrees/Mi
RWW1.8FO (RWWEO)	CON	Quarterly	Rancho Seco Reserv /114 /1.8
RWW2.1MO (RWWBO)	IND	Quarterly	Clay Area Well /254 /2.1
MUD AND SILT			
RMS0.3MO (NEW)	IND	Quarterly	Effluent Discharge /250 /0.3
RMS0.6MO (RMSEO)	IND	Quarterly	Site Boundary /255 /0.6
RMS0.7NO (NEW)	IND	Quarterly	Water Sump /265 /0.7
RMS1.3FO (RMSCO)	IND	Quarterly	Rancho Seco Reserv /104 /1.3
RMS1.8NO (NEW)	IND	Quarterly	Confluence of Clay and Hadselville Creeks /272 /1.8
RMS2.2NO (NEW)	IND	Quarterly	Hadselville Creek above Clay Station Road /260 /2.2
RMS3.7NO (NEW)	IND	Quarterly	Laguna Creek at Folsom South Canal /260 /3.7
RMS5.4MO (NEW)	IND	Quarterly	Laguna Creek at Laguna Road /256 /5.4
RMS10.MO (NEW)	IND	Quarterly	Laguna Creek at McKenzie Road /259 /10.
RMS12.GO (NEW)	CON	Quarterly	Camanche Reservoir /130 /12.

RADIOLOGICAL ENVIRONMENTAL SAMPLING LOCATIONS

SAMPLE TYPE IDENTIFICATION (OLD ID#)	SAMPLE CLASS	COLLECTION FREQUENCY	DESCRIPTION OF LOCATION Location Name/ Degrees/Mi
FISH SAMPLES			
RFS0.3MO (RFBO)	IND	Quarterly	Effluent Discharge /250 /0.3
RFS0.6MO (RFDO)	IND	Quarterly	Site Boundary /255 /0.6
RFS0.7NO (NEW)	IND	Quarterly	Water Sump /265 /0.7
RFS1.3FO (RFAO)	CON	Quarterly	Rancho Seco Reserv /104 /1.5
RFS1.8NO (NEW)	IND	Quarterly	Confluence of Clay and Hadselville Creek /272 /1.8
RFS2.2NO (NEW)	IND	Quarterly	Hadselville Creek above Clay Station Road /260 /2.2
RFS3.7NO	IND	Quarterly	Laguna Creek Near Folsom South Canal /260 /3.7
RFS5.4MO (NEW)	IND	Quarterly	Laguna Creek at Laguna Road /256 /5.4
RFS10.MO (NEW)	IND	Quarterly	Laguna Creek at McKenzie Road /259 /10
ALGAE SAMPLES			
RAG0.3MO (RBAO)	IND	Quarterly	Effluent Discharge /250 /0.3
RAG0.6MO (NEW)	IND	Quarterly	Site Boundary /255 /0.6
RAG0.7NO (NEW)	IND	Quarterly	Water Sump /265 /0.7

RADIOLOGICAL ENVIRONMENTAL SAMPLING LOCATIONS

SAMPLE TYPE IDENTIFICATION (OLD ID#)	SAMPLE CLASS	COLLECTION FREQUENCY	DESCRIPTION OF LOCATION Location Name/ Degrees/Mi
RAG1.3FO (NEW)	CON	Quarterly	Rancho Seco Reserv /104 /1.3
RAG1.8NO (NEW)	IND	Quarterly	Confluence of Clay and Hadselville Creek /272 /1.8
RAG2.2NO (NEW)	IND	Quarterly	Hadselville Creek near Clay Station Road /260 /2.2
RAG3.7NO (RBBO)	IND	Quarterly	Hadselville Creek at Folsom South Canal /260 /3.7
RAG5.4MO (NEW)	IND	Quarterly	Laguna Creek at Laguna Road /256 /5.4
RAG10.MO (NEW)	IND	Quarterly	Laguna Creek at McKenzie Road /259 /10.
RABBIT			
RRBX.XNO (NEW)	IND	Quarterly	West of the Site Boundary/X.X
SOIL			
RSL0.6MO (NEW)	IND	Quarterly	Site Boundary /255 /0.6
RSL0.7NO (NEW)	IND	Quarterly	Silva Property /250 /0.7
RSL1.3FO (NEW)	CON	Quarterly	Rancho Seco Reserv /104 /1.3
RSL1.5NO (NEW)	IND	Quarterly	Silva Property /264 /1.5
RSL1.8NO (NEW)	IND	Quarterly	Silva Property /268 /1.8

RADIOLOGICAL ENVIRONMENTAL SAMPLING LOCATIONS

SAMPLE TYPE IDENTIFICATION (OLD ID#)	SAMPLE CLASS	COLLECTION FREQUENCY	DESCRIPTION OF LOCATION Location Name/ Degrees/Mi	
CRAWFISH				
RCF0.6MO (NEW)	IND	Quarterly	Site Boundary	/245 /0.6
RCF0.7NO (NEW)	IND	Quarterly	Water Sump	/265 /0.7
RCF3.7NO (NEW)	IND	Quarterly	Hadselville Creek at Folsom South Canal	/260 /3.7
RCF10MO (NEW)	IND	Quarterly	Laguna Creek at McKenzie Road	/259 /10
GARDEN VEGETABLES HARVESTED AT LEAST SEMI-ANNUALLY (= SA), MONTHLY THROUGHOUT THE GROWING SEASON) (= MTGS)				
RLV0.5AO (NEW)	IND	SA-MTGS	Site Garden North	/ 5 /0.5
RLV0.5EO (NEW 1988)	IND	SA-MTGS	Site Garden East	/ 92 /0.5
RLV0.5JO (NEW 1988)	IND	SA-MTGS	Site Garden South	/182 /0.5
RLV0.5NO (NEW 1988)	IND	SA-MTGS	Site Garden West	/275 /0.5
RLV0.6MO (NEW)	IND	SA-MTGS	Site Garden at Site Boundary, irrigated with Clay Creek Water	/245 /0.6
RLV2.1MO (RLVAO)	IND	SA	Clay Station Area	/250 /2.1
RLV9.5EO (RLVCVO)	IND	SA	Ione Area	/ 90 /9.5

RADIOLOGICAL ENVIRONMENTAL SAMPLING LOCATIONS

SAMPLE TYPE IDENTIFICATION (OLD ID#)	SAMPLE CLASS	COLLECTION FREQUENCY	DESCRIPTION OF LOCATION Location Name/	Degrees/Mi
RLV11.JO (RLVCO)	IND	SA	Clements Area	/171 /11.
RLV11.RO (RLVDO)	IND	SA	Sloughhouse Area	/341 /11
RLV18.KO (RLVFO)	CON	SA	Lodi Area	/212 /18
HONEY				
RSHX.XNO (NEW)	IND	SA	NEAREST HIVES TO THE WEST	
BEEF TISSUE				
RBFX.XNO (NEW)	IND	SA	BEEF TISSUES FROM CATTLE RAISED WEST OF THE SITE	
BEEF THYROID				
RBTX.XNO (NEW)	IND	SA	THYROID GLAND FROM CATTLE THAT WERE RAISED WEST OF THE SITE	
PHEASANT				
RPHX.XNO (NEW)	IND	ANNUALLY	PHEASANT TAKEN WEST OF THE SITE	
SQUIRREL				
RSQX.XNO (NEW 1988)	IND	AS NEEDED	COLLECT FROM WEST OF THE PLANT NEAR SITE BOUNDARY GARDEN To be collected if squirrel meat enters food chain	

RADIOLOGICAL ENVIRONMENTAL SAMPLING LOCATIONS

SAMPLE TYPE IDENTIFICATION (OLD ID#)	SAMPLE CLASS	COLLECTION FREQUENCY	DESCRIPTION OF LOCATION Location Name/ Degrees/Mi
FROGS			
RFG0.6MO	IND	Quarterly	Site Boundary /255 /0.6
RFG2.2NO	IND	Quarterly	Hadselville Creek at Clay Station Road /260 /2.2
RFG3.7NO	IND	Quarterly	Hadselville Creek at Folsom South Canal /260 /3.7
RFG10.MO	IND	Quarterly	Laguna Creek at McKenzie Road /259 /10.

TABLE 4

ENVIRONMENTAL THERMOLUMINESCENT DOSIMETER LOCATIONS

IDENT/DESIG NUMBER	CLASS IND/CON	TLD MAP #	IDENT/DESIG NUMBER	CLASS IND/CON	TLD MAP #
RTL0.3RO	IND	1	RTL1.7LO	IND	21
RTL0.3EO	IND	2	RTL1.6JO	IND	22
RTL0.3NO	IND	3	RTL1.8KO	IND	23
RTL0.3LO	IND	4	RTL1.7HO	IND	24
RTL0.3HO	IND	5	RTL3.8LO	IND	25
RTL0.4EO	IND	6	RTL3.9KO	IND	26
RTL0.5CO	IND	7	RTL3.6JO	IND	27
RTL6.2QO	IND	8	RTL3.7HO	IND	28
RTL23.QO	CON	9	RTL4.2JO	IND	29
RTL18.KO	CON	10	RTL7.4MO	IND	30
RTL0.6KO	IND	11	RTL3.7NO	IND	31
RTL9.0EO	CON	12	RTL4.8PO	IND	32
RTL10.NO	IND	13	RTL3.8MO	IND	33
RTL11.MO	CON	14	RTL3.8QO	IND	34
RTL10.HO	CON	15	RTL1.9NO	IND	35
RTL2.7LO	IND	16	RTL1.6PO	IND	36
RTL8.2KO	IND	17	RTL1.9QO	IND	37
RTL7.8CO	IND	18	RTL1.6RO	IND	38
RTL0.7GO	IND	19	RTL1.5BO	IND	39
RTL1.5MO	IND	20	RTL1.5AO	IND	40

ENVIRONMENTAL THERMOLUMINESCENT DOSIMETER LOCATIONS

IDENT/DESIG NUMBER	CLASS IND/CON	TLD MAP #	IDENT/DESIG NUMBER	CLASS IND/CON	TLD MAP #
RTL1.8CO	IND	41	RTL14.PO	CON	61
RTL4.4GO	IND	42	RTL11.MO	CON	62
RTL1.8FO	IND	43	RTL0.8DO	IND	63
RTL[illegible].6EO	IND	44	RTL9.5EO	IND	64
RTL1.8FO	IND	45			
RTL1.4DO	IND	46			
RTL3.0CO	IND	47			
RTL3.7DO	IND	48			
RTL3.2EO	IND	49			
RTL3.5FO	IND	50			
RTL10.EO	CON	51			
RTL19.EO	CON	52			
RTL12.GO	CON	53			
RTL11.JO	IND	54			
RTL8.0PO	IND	55			
RTL4.6QO	IND	56			
RTL7.6AO	IND	57			
RTL6.6BO	IND	58			
RTL11.RO	CON	59			
RTL11.AO	CON	60			