U. S. NUCLEAR REGULATORY COMMISSION

REGION V

Report No. 70-00754/86-03

Docket No. 07000754

License No. SNM 960

Licensee: General Electric Company
Vallecitos Nuclear Center
P. O. Box 460
Pleasanton, CA 94566

Facility Name: Vallecitos Nuclear Center

Inspection at: Pleasanton, CA 94566

Inspection Conducted: October 31, 1986; November 14, 1986; November 21, 1986; November 24, 1986; November 25 - December 5, 1986 (analysis of samples)

Inspector: P R Zurakowski — 1-6-87
P. R. Zurakowski, Radiation Specialist — Date Signed

J. F. Pang — 1-6-87
J. F. Pang, Radiation Specialist — Date Signed

Approved by: R D Thomas — 1/6/87
R. D. Thomas, Chief — Date Signed
Nuclear Materials Safety Section

Summary:

Inspection of October 31, November 14, 21, 24, November 25-December 5, 1986 (Report No. 70-00754/86-03)

Areas Inspected: In a letter dated September 24, 1986, the licensee requested NRC Region V to conduct a confirmatory survey of a Radwaste Storage Area located in back of Building 400, Vallecitos Nuclear Center, to establish that the area can be released for unrestricted use. A confirmatory survey was conducted on October 31, 1986, by two NRC inspectors. Surveys and collection of soil samples were taken on November 14, 21, and 24 by one NRC inspector. Analysis of the soil samples were performed by the NRC Region V Radiation Laboratory Specialist.

Results: The confirmatory survey of October 31, 1986, disclosed that the NRC guidelines shown in Appendix A were not met. The licensee then conducted further decontamination efforts. Subsequent confirmatory surveys, conducted with a Micro-R portable gamma scintillation survey instrument, an air proportioned alpha survey instrument, a beta gamma survey instrument and laboratory multichannel analyser, found the contamination levels were within

the NRC guidelines as shown in Appendix A. The soil contamination levels as shown in Table 1 were within the release criteria for soil as specified in SECY 81-576, Disposal or Onsite Storage of Residual Thorium or Uranium from Past Operations, dated October 5, 1981. Based on the results of these surveys and soil sample data, it was determined that the Radwaste Storage Area located at the Vallecitos Nuclear Center can be released for unrestricted use.

DETAILS

1. Persons Contacted

Mr. G. E. Cunningham, Senior Licensing Engineer
Mr. D. C. Bowden, Senior Engineer Nuclear Safety
Ms. L. Kessler, Associate Chemist

2. Background

In a letter dated September 24, 1986, the licensee requested NRC Region V to conduct a confirmatory survey of the Radwaste Storage Area located at the rear and adjacent to Building 400 of the Vallecitos Nuclear Center. The area in question is located adjacent to the High Bay Area of Building 400 (Figure 1) and consisted of a concrete pad approximately 20 feet in length by 8 feet in width. The pad was covered by an I-beam type structure with an aluminum sheet roof. The common wall with the High Bay Area was aluminum siding. The other three sides were enclosed with cyclone fencing with an outer layer of fiberglass siding. (Note: The fencing/aluminum siding walls and concrete pad were completely removed prior to the final NRC surveys.)

The pad held a one-thousand gallon steel tank which received liquid waste from the High Bay Area (natural, depleted, and low-enriched uranium). A second steel tank (100 gallons) was located in a concrete vault below grade level. This tank served as an overflow for the waste tank and as a sump for the High Bay Area.

The vault containing the sump tank was free-poured concrete. A circular form was used for the vault cavity, but no forms were used for the outer surface. As a result, the vault was an irregular concrete mass with a concrete thickness of 1-1/2 to 2 feet. The vault has been removed as a single unit. The vault and both tanks were disposed of as radioactive waste prior to the first NRC survey.

The licensee has stated that they wish to release both Building 400 and the adjacent Radwaste Storage Area for unrestricted use. However, because there is no longer a seal between the Radwaste Storage Area and the High Bay Area due to extensive excavation heavy rains during the winter months would cause flooding and impede further work inside the building. Therefore, the licensee's wishes at this time to release the Radwaste Storage Area for unrestricted use so that the excavation may be filled in and capped.

This report presents the results of the NRC confirmatory surveys on October 31, November 14, November 21, and November 24, 1986. Soil samples taken on November 21 and 24 were analyzed by Region V's Radiation Laboratory Specialist during the weeks of November 24 and December 1, 1986.

The survey criteria were based on NRC requirements established by the "Guidelines for Decontamination of Facilities and Equipment Prior to

Release for Unrestricted Use or Termination of Licenses for By-products, Source, or Special Nuclear Material, July 1982." (Appendix A).

The criteria for soil release was based upon data from SECY 81-576, Disposal or Onite Storage of Residual Thorium or Uranium from Past Operations, dated October 5, 1981.

3. Confirmatory Survey of October 31, 1986

A. Instruments

The field radiation detection instruments selected for this survey were: (1) an Eberline Model E-520 Geiger Counter with a "pancake" probe, (2) an Eberline Model PRM-7 gamma scintillation survey meter, and (3) LRL alpha survey meter. The specific instruments used and their calibration status were:

Instrument	Identification No.	Calibration Due
Eberline E-520 Geiger Counter	NRC 008252	February 10, 1987
Eberline PRM-7 Micro-R Meter	NRC 008596	January 28, 1987
LRC Alpha Survey Meter	NRC 000374	May 10, 1987

B. Areas Surveyed

Approximately 2/3 of the concrete pad was still in place during the survey of October 31, 1986. The Inspectors found yellow stains in cracks and under the concrete edge overflow barrier contained activity in excess of the release limits specified in Appendix A. Readings with the E-520 using a calibrated pancake probe of 1500 to 4000 cpm translated to reading from 20,000 to 53,000 dpm/100 cm^2. The licensee stated that the entire concrete pad would be removed and arrangements would be made to obtain core samples from the area where the 100 gallon radwaste tank had been.

4. Confirmatory Survey of November 14, 1986

A. Instruments

The instruments used were the same ones identified in 3A above.

B. Areas Surveyed

Prior to this survey it was noted that the concrete pad, aluminum roof and support, and the chain link fence had been removed leaving a 2½' deep X 9' X 24' trench where the pad had formerly been located.

(1) Micro-R Meter Survey

The entire 8' X 20' trench area where the concrete pad had been and the common wall with the High Bay to a height of 6' were

surveyed. No reading above the 10-12 micro-R per hour background was found.

(2) Alpha and Beta Surveys

An approximately 75% survey of the concrete footing next to the common wall with the High Bay was made with an Eberline E-520 instrument and a pancake probe. This footing was approximately 2.5' X 20' in size. All readings were less than 50 cpm with four exceptions, two spots read 150 cpm and two others read 100 cpm. Random spot checks with the LRC alpha survey instruments covering approximately 10% of the area indicated all readings were less than 10 cpm. The highest of the above readings, 150 cpm, when translated to dpm indicated a reading of 1350 dpm/100 cm^2 for the two elevated spots. This is well within the limits for fixed contamination in a small area.

No reading above background was found on the common wall with the High Bay with any of the three instruments used.

A 25% random spot check of the soil inside the trench with the E-520 instrument and a pancake probe indicated no readings above background. Background was measured to be approximately 50 cpm/per probe area. Soil samples taken in the area are discussed in the next section.

5. Soil Contamination Survey of November 21, 1986

On November 21, 1986, the licensee arranged to have a contractor to take soil (core) samples in the area where the 100 gallon waste tank had formerly been buried. See Figure 1 for details on where the core samples were taken. The twelve samples taken (2 samples per core) were placed in a drying oven over the weekend of November 22-23. Upon removal from the oven on November 24, the samples were randomized and split with the licensee for analysis. The twelve samples taken by Region V were analyzed by gamma spectroscopy utilizing a Nuclear Data 6600 System fitted with an 18% Relative Germanium Detector. The analyses were performed by Region V's Radiation Laboratory Specialist during the weeks ending November 28 and December 5, 1986. The results are shown in Table 1.

6. Conclusion

The radiological surveys and soil contamination levels of the Radwaste Storage Area located adjacent to the High Bay Area of Building 400, Vallecitos Nuclear Center, Pleasanton, California, indicated that this area is well within the NRC release limits for unrestricted use. Since it has been found that the NRC guidelines for release to unrestricted use have been met, it is the recommendation of Region V that this area be released for unrestricted use.

TABLE 1

GE Vallecitos Soil

Sample No.	U pCi/gm	Th pCi/gm
Top-1	0.9	1
Top-2	0.8	0.9
Top-3	0.9	1
Top-4	0.8	1
Top-5	0.8	1
Top-6	0.7	0.9
Bot-1	0.9	1
Bot-2	1	0.9
Bot-3	0.8	1
Bot-4	0.8	1
Bot-5	0.9	1
Bot-6	0.9	1

A 100 gram fraction of each of the 12 soil samples was analyzed by gamma spectroscopy with a minimum counting time of about 3 hours. The U and Th values were inferred from daughter product activities on the assumption that equilibrium was present at least through Ac-228 for the Th-232 chain and through Bi-214 for the U-238 chain. Within the statistical uncertainty of the measurements, U-235 concentrations are consistent with the U-235/U-238 ratio for natural uranium.

Appendix A

ACCEPTABLE SURFACE CONTAMINATION LEVELS

NUCLIDES[a]	AVERAGE[b c f]	MAXIMUM[b d f]	REMOVABLE[b e f]
U-nat, U-235, U-238, and associated decay products	5,000 dpm a/100 cm^2	15,000 dpm a/100 cm^2	1,000 dpm a/100 cm^2
Transuranics, Ra-226, Ra-228, Th-230, Th-228, Pa-231, Ac-227, I-125, I-129	100 dpm/100 cm^2	300 dpm/100 cm^2	20 dpm/100 cm^2
Th-nat, Th-232, Sr-90, Ra-223, Ra-224, U-232, I-126, I-131, I-133	1000 dpm/100 cm^2	3000 dpm/100 cm^2	200 dpm/100 cm^2
Beta-gamma emitters (nuclides with decay modes other than alpha emission or spontaneous fission) except Sr-90 and others noted above.	5000 dpm βT/100 cm^2	15,000 dpm βT/100 cm^2	1000 dpm βT/100 cm^2

[a] Where surface contamination by both alpha- and beta-gamma-emitting nuclides exists, the limits established for alpha- and beta-gamma-emitting nuclides should apply independently.

[b] As used in this table, dpm (disintegrations per minute) means the rate of emission by radioactive material as determined by correcting the counts per minute observed by an appropriate detector for background, efficiency, and geometric factors associated with the instrumentation.

[c] Measurements of average contaminant should not be averaged over more than 1 square meter. For objects of less surface area, the average should be derived for each such object.

[d] The maximum contamination level applies to an area of not more than 100 cm^2.

[e] The amount of removable radioactive material per 100 cm^2 of surface area should be determined by wiping that area with dry filter or soft absorbent paper, applying moderate pressure, and assessing the amount of radioactive material on the wipe with an appropriate instrument of known efficiency. When removable contamination on objects of less surface area is determined, the pertinent levels should be reduced proportionally and the entire surface should be wiped.

[f] The average and maximum radiation levels associated with surface contamination resulting from beta-gamma emitters should not exceed 0.2 mrad/hr at 1 cm and 1.0 mrad/hr at 1 cm, respectively, measured through not more than 7 milligrams per square centimeter of total absorber.

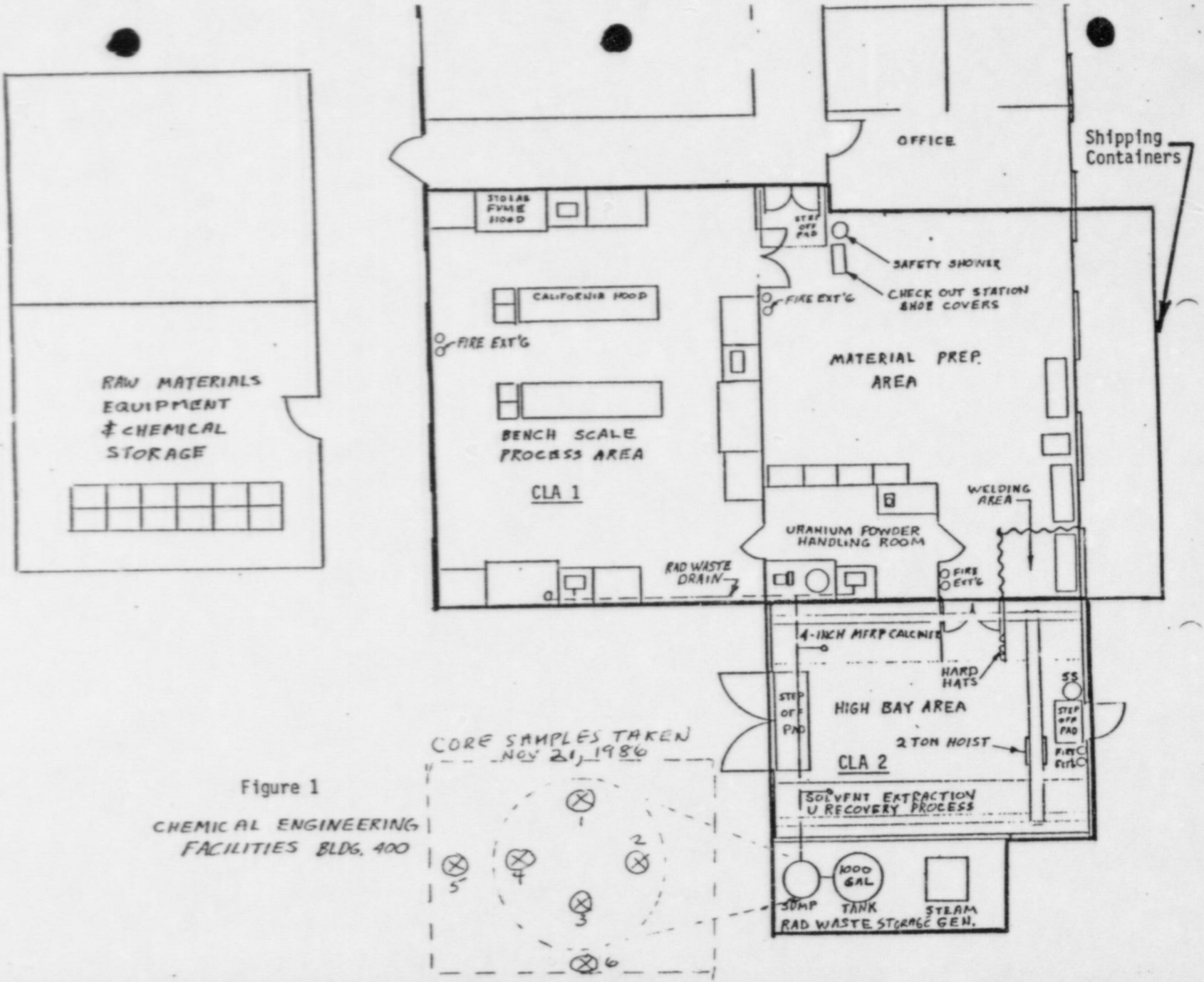

Figure 1

CHEMICAL ENGINEERING
FACILITIES BLDG. 400