SRE Pond + Sewer system + industrial waste system

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FORM 332-C REV. 11-78

ABSTRACT

Provides activity requirements for the removal and disposition of radioactive contaminated soil and rock from the retention pond, sanitary sewer system, and related appurtenances exterior of SRE Building 143.

This report is Activity Task No. 27.

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NO. N704ACR990024
PAGE 1.1

REV	SUMMARY OF CHANGE	APPROVALS AND DATE
A	(1) Title page - new distribution list (2) Table 1, page 6, expanded to include upper cr amination limits for soil and concrete.	C. C. Conners B. F. Ureda 8-31-81 J. M. Marzec R. Aguilera M. E. Remley REL. DATE: 9-15-81

FORM 784-C-1 REV. 4-78

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1.0 OBJECTIVE

Provide technical guidance and establish the requirements needed to safely preserve the area and make the SRE retention pond, dam, and the abandoned sewer leach field and septic tank safe for general access at lowest cost and without any requirements for special licenses.

This work is identified as Task 27 in the SRE Facility Dismantling Plan, FDP-704-990-003.

2.0 APPLICABLE DOCUMENTS

2.1	SRE Facility Dismantling Plan - FDP-704-990-003
2.2	Operational Safety Plan - SRR-704-990-001
2.3	Quality Assurance Plan - PP-704-990-001
2.4	D&D Program Plan - PP-704-990-002
2.5	Plant Rules and Regulations - Publication 511-C for Construction Workers
2.6	Radiological Survey of SRE Site - HSRS Records
2.7	State of California Construction Safety Orders
2.8	State of California Dam Safety Requirements
2.9	Drawing List (see Appendix A)
2.10	Decontamination and Disposition of Facilities Configuration Summary - N704-CS-900-001

3.0 SITE HISTORY AND STATUS

The general topography and location of the area of concern is shown in Figure 1. Figure 2 is a photo of the area taken when the retention pond is at about one-eighth capacity. (Approximately 0.1×10^6 gal of water).

The retention pond is weed infested and algae laden. An unknown but significant quantity of silt from the SRE improved site is deposited on the bottom. The last known clean out was in 1958 as a part of the dam repair project.

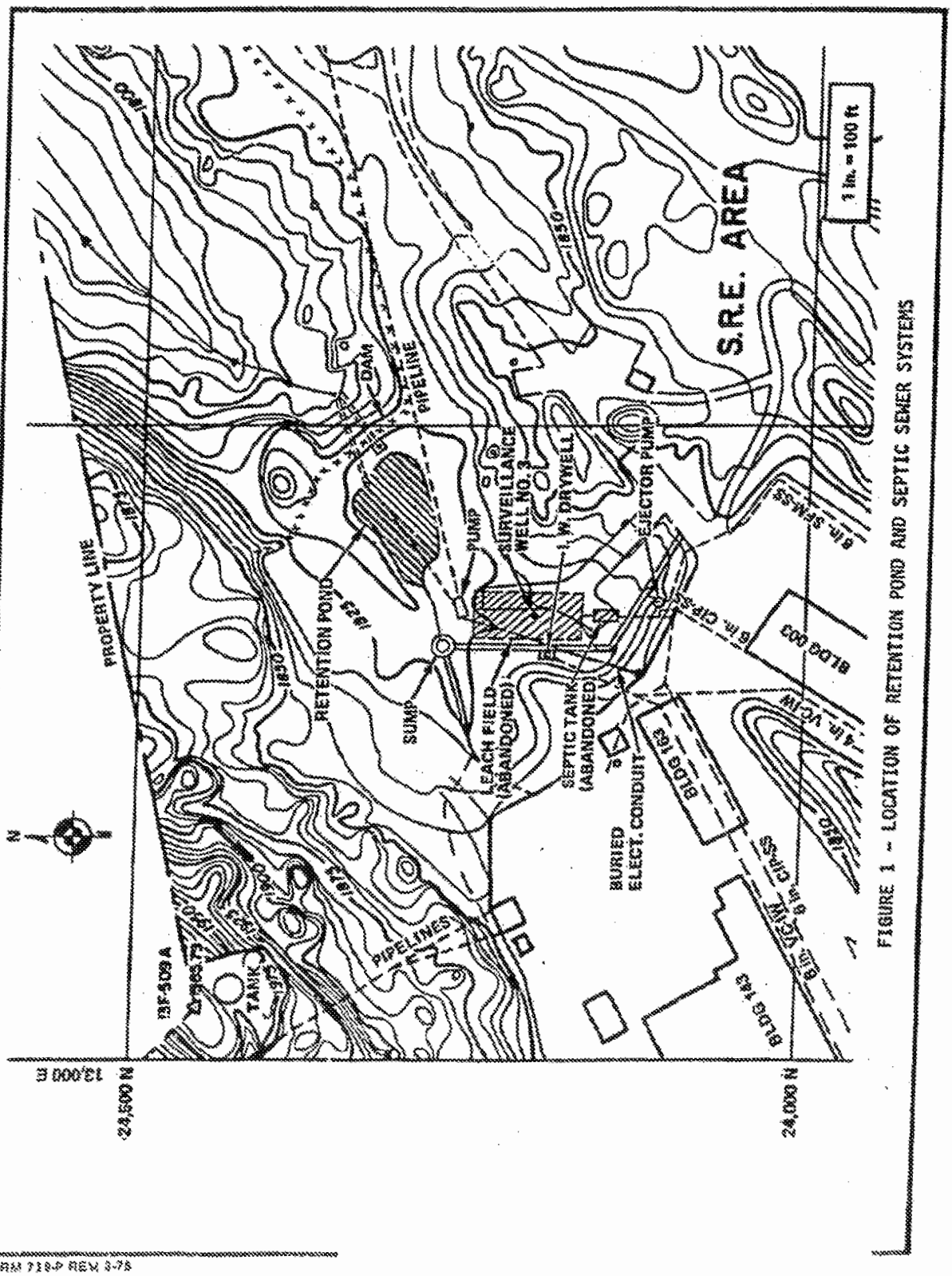

FIGURE 1 – LOCATION OF RETENTION POND AND SEPTIC SEWER SYSTEMS

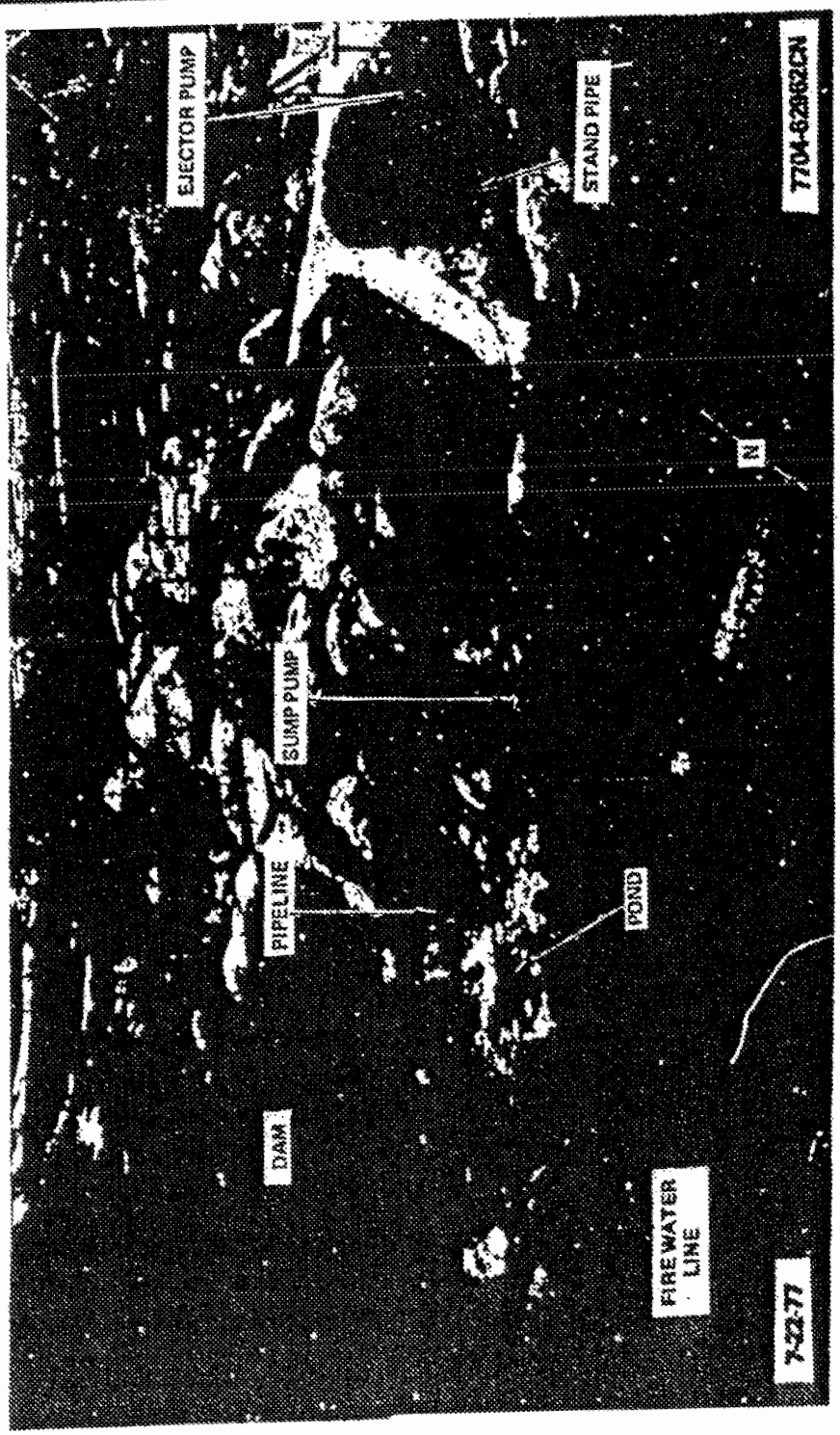

FIGURE 2 - GENERAL VIEW OF SRE RETENTION POND AREA

The retention pond dam is a compacted native earth embankment constructed in 1956 as part of the original SRE site improvement. No selected impervious materials were placed in the pond or dam. Natural seepage and evaporation were to control the seasonal water level in the pond and provide capacity for winter storm water collection. The dam was damaged by storm flow in 1958 and the repairs included the installation of a 1.5 ft diameter valved outlet pipe. A year later, as a result of complaints from downstream property owners, additional repairs included the installation of a 6 ft diameter overflow pipe and a pumped sump located at the confluence of the two main drain channels upstream from the pond. The sump collected all the water from the SRE improved area. The pump, acting on an automatic level switch in the sump, pumped the water at 350 gpm through a 4 in. diameter overland pipe to a channel leading to the Rocketdyne Area II Delta Ponds. The overflow there is into Bell Canyon and thence to the Los Angeles River system. When the sump filled with silt, it was abandoned in place and the pump suction inlet was changed to a raft floating on the SRE retention pond. This is the present general arrangement and it appears to be fully functional. The approximate 0.8×10^6 gal maximum impoundment behind the dam is far below the 16×10^6 gal minimum requirements for jurisdiction by the California Department of Dam Safety and no license from the agency is required for continued use.

The septic sewer system was installed above and southwest of the retention pond as part of the original SRE site improvement. It served as the nonradioactive sanitary waste disposal for Buildings 143 and 003. Laboratories and radioactive facilities were not connected to it but were provided with isolation tanks. When the central sewer became available in 1961, the sewer line was connected to it by an ejector pump. The septic tank and leach field were then abandoned in place. A 6 in. diameter pump out stand pipe extends above the ground on the south end of the abandoned septic tank. There is no other physical evidence of the abandoned septic system on the surface.

An industrial waste system parallels the sanitary sewer but terminates in a dry well adjacent to the leach field. It was installed in the original improvement and has not been altered. Any overflow from the dry well is into the concrete channel leading to the sump and pond. By the character of the connections to the industrial waste line, there is little expectancy of radioactive contamination, though there may be chemical concentrations of cooling water algicides.

The SRE site records show only two spills of radioactive waste solutions that could have potential effect on the pond. The overflow of the liquid waste storage tanks near Building 653 appeared to be confined to the local area and was cleaned up shortly afterward. The draining of test water from the new liquid waste tanks T2 and T3 in 1964 sent radioactive solutions to the pond and to the Delta Ponds. The total release did not exceed 60 μCi. The concentration in the pond was less than 2 pCi/cc, and in the Delta Ponds, 0.1 pCi/cc. The identification of isotopes included ^{60}Co which contributed about 5% of the radioactivity.

There is no recorded discharge of radioactive material in the septic sewer or industrial waste systems.

4.0 SCOPE OF WORK

Detailed Working Procedures are to be prepared for the radiological investigation, decontamination, and specified restoration of the SRE retention pond and dam, industrial waste system, and abandoned septic sewer system. The procedures are to be made consistent with the procedural and operational requirements of this Activity Requirement Document.

The documentation, plans, and procedures are to be prepared according to established D&D Program procedure. They will provide for maximum safety of personnel and property consistent with the minimum cost objectives.

5.0 PROCEDURAL REQUIREMENTS

5.1 Working Procedures

Detailed Working Procedures (DWP) will be prepared by Radioactive Material Disposal, Dept. 731-150, for release. They will describe equipment and materials identification, personnel training, and instruction requirements identified herein. The Detailed Procedures will delineate the steps and sequence of the investigation and removal operations to conform to the requirements of the Operational Safety Plan, SRR-704-990-001, Section V, "General Radiation and Industrial Hygiene and Safety Procedures."

The DWP's will be released and controlled by Technical Data Services, Dept. 731-120. Approval for release will be obtained in accordance with the Engineering Release Plan of Action, RPA-704-990-001.

DWP's will contain the following statement: "A single designated working copy of the DWP may be changed in red ink (red lined) by the authorized Development and Test representative as procedural changes dictate. A Health and Safety representative must approve and sign those changes affecting health or safety; the Program Office Project Manager must approve and sign those changes affecting the scope of the task, i.e., cost or schedule; and Quality Assurance must approve and sign those changes affecting quality. At the completion of the task covered by the DWP, the marked-up working copy will be incorporated into the DWP as an Appendix, reviewed by Quality Assurance, and released for vault storage by Technical Data Services."

A released work copy of the procedure is to be available at the site while work is in progress. Upon completion of blocks of work, the procedures are to be dated and initialed. Changes to procedures will be noted on the work copy as indicated above. In addition, a daily log of the progress is to be kept by RMDF assigned supervision.

All findings of any radiological survey will be reported in a Supporting Document released through Engineering Technical Services.

5.2 Safety Requirements

The safety of operating personnel will be paramount including the safety of the affected facilities themselves. All safety matters are under the direction of Health Safety and Radiation Services, Dept. 778.

All personnel will be required to follow applicable portions of Cal OSHA Construction Safety Orders. In addition, contractors will be required to follow procedures and practices outlined in Publication 511-C, Rules and Regulations for Construction Workers.

The existing change facilities at the SRE will be used for all required personal protective gear and measures.

A radiological and physical hazards survey will be conducted as the first activity on the site. Particular care must be exercised to locate and identify any ongoing process that can concentrate radioactive materials. Preliminary estimates indicate that the initial dispersion and dilution of radioactive materials was well below present allowable concentration limits.

Decontamination of the site shall be to radiation levels not excluding those shown in Table 1.

All equipment used in the excavation process or nonporous materials showing radioactive surface contamination will be decontaminated to levels as low as practicable (ALAP) but in all cases, to levels below those shown in Table 1 before release for general use. Consistent with the lowest cost objective, it may be practical to dispose of a contaminated component as radioactive material without attempting decontamination.

TABLE 1

UPPER CONTAMINATION LIMITS FOR DECONTAMINATION AND DISPOSITION AT THE SRE FACILITY

A.	Surfaces	
	Beta Gamma Emitters:	Total = 0.1 mrad/h at 1 cm, with 7 mg/cm^2 absorber
		Removable = 100 dpm/100 cm^2
	Alpha Emitters:	Total = 100 dpm/100 cm^2
		Removable = 20 dpm/100 cm^2
B.	Soil	
	Near Surface:	100 pCi/g gross detectable beta activity
	Below 3 m (average):	1000 pCi/g gross detectable beta activity
	*(maximum):	3000 pCi/g gross detectable beta activity
C.	Concrete	100 pCi/g gross detectable beta activity

*The maximum value may be average over a volume of 1 m^3 to meet the limit for the average value.

As materials are removed from their present location, they will be surveyed for radioactivity. Radioactive materials removed from the site will be packaged for disposal as radioactive waste. All radioactive waste generated for disposal will be shipped for land burial at the ERDA licensed burial site in Beatty, Nevada.

Soil samples from excavations made for the purpose of removing contaminated soil or rocks shall demonstrate that no radioactivity above the Table 1 limits in the site prior to backfilling with clean soil. Prior to any repaving, a surface survey shall demonstrate that the surface total radiation levels are below the levels shown in Table 1.

Protective measures will be taken to prevent the spread of contamination about the site. Specific work areas may have restricted access. Standard procedures for safely handling contaminated material will be employed per Operational Safety Plan SRR-704-990-001.

Personnel handling radioactive materials will be trained as provided in the Training Plan N704TNP990001. All personnel directly associated with the decontamination activities shall be made aware of the site operations history and the present radiological and physical hazards status.

If the dam embankment or foundations are to be excavated, the planned work and reconstruction must be reviewed by qualified engineering personnel to assure the continued safety of the dam and conformance to the State of California Division of Dam Safety requirements.

5.3 Quality Assurance

Quality Assurance actions and requirements will be governed by the Quality Assurance Program Plan PP-704-990-001, and the Operational Safety Plan, SRR-704-990-001.

6.0 OPERATIONAL REQUIREMENTS

6.1 Organization

The work will be directed by the Remote Technology Unit, Dept. 731-540. All handling of radioactive materials including decontamination will be performed by the Remote Technology Unit, Dept. 731-540. Industrial Engineering, Dept. 768, will coordinate all contractor activities and provide maintenance support as needed to assure operation of fixed equipment. Radiation and Nuclear Safety, Department 779-210, will provide the Health Physics coverage as specified in the Operational Safety Plan. The Fire Dept., Dept. 052, will provide support as needed and will issue permits for burning and welding. The D&D Program Office, Dept. 713-350, will monitor the progress, arrange for photography, interface with the purchasing and Industrial Engineering for outside services or goods, and will assist in the resolution of problems.

6.2 Activity

Before beginning any physical activity relating to the decontamination and disposal of the site, a preliminary radiological and physical hazard survey will be conducted and reported by Health Safety and Radiation Services Department. This survey will constitute sampling and counting

selected areas of the pond bottom, trees and plants growing in and near the pond and over the abandoned leach field, septic tank water, SRE surveillance well No. 3, and other areas as they appear to be necessary to establish an understanding of the extent and the general pattern of any radioactive contamination or physical hazards on the site.

As shown by the requirements of the preliminary survey, the elimination of radioactive contamination and physical hazards will be planned and executed. The pond will be completely drained by pumping. No water is to be released to flow down the natural drainage below the dam. The fence, perimeter fire line, central sewer pipes and pumps, and industrial waste lines are to be protected from damage or interruption. The brush and weeds are to be removed and disposed of as indicated by the radiation test or access needs. Soil and rock are to be excavated only as needed to remove and/or repair areas with proven radioactive contamination or physical hazard.

The site drainage channels are to be restored and any loose soil is to be protected from storm water erosion with suitable rock or plant life cover. The dam and its outlets, overflow channels, and erosion protection are to be restored in full conformance with current dam safety and inspection requirements. The existing pond pumping system, including the automated features, is to be restored to be fully functional. If the abandoned septic system is excavated, it is to be brought to a safe and practical grade with clean native soil backfill.

Handling and packaging of radioactive materials will be done to standards established for this activity by the RMDF.

APPENDIX A

References

Internal Letter dated September 28, 1961, R. W. Dickinson, et al., from J. C. Lang and W. J. Freede, "Decontamination of SRE Liquid Waste Storage Tank Area"

Internal Letter dated April 17, 1964, R. M. Hill from F. H. Badger, "SRE Radioactive Liquid Release"

Drawings

303-773-C3	SRE Area Dam Repair and Improvements
303-773-C7	SRE Dam Sump, Overflow and Pump Facilities
303-773-C9	SRE Dam Standby Pump Access Road Paving
303-773-P2	Conceptual Design for Pump Piping SRE Dam
303-143-C9	SRE Site As-Built Plot Plan
303-GEN-C17	Central Sewage System Plan and Topography
9693-77149	Drainage Details Leach Field Area, SRE
9693-77130	Elevations for Grading at Septic Tank Effluent Lines
9693-77104	As-Built Sanitary and Industrial Waste Disposal SRE
9693-77108	Grading Plan SRE Site
9693-77277	Installation of Dam Gate
9693-77147	Drainage Ditch and Culverts for SRE Area
9693-77125	Sanitary Sewer and Industrial Waste Disposal System

The references listed above are available from the following files:

Internal Letters - HS&RS Files

303-XXX-XX - F&IE Files

9693-XXXXX - TD-TS Files