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Energy Systems Group

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M.E. REMLEY

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Radiological Survey Results--Release to Unrestricted Use, Building 003

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IR&D PROGRAM? YES  NO   
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ABSTRACT

The results of the radiological survey for Building 003 are described. All survey results are below the applicable limits, indicating that this area may be released to unrestricted use.

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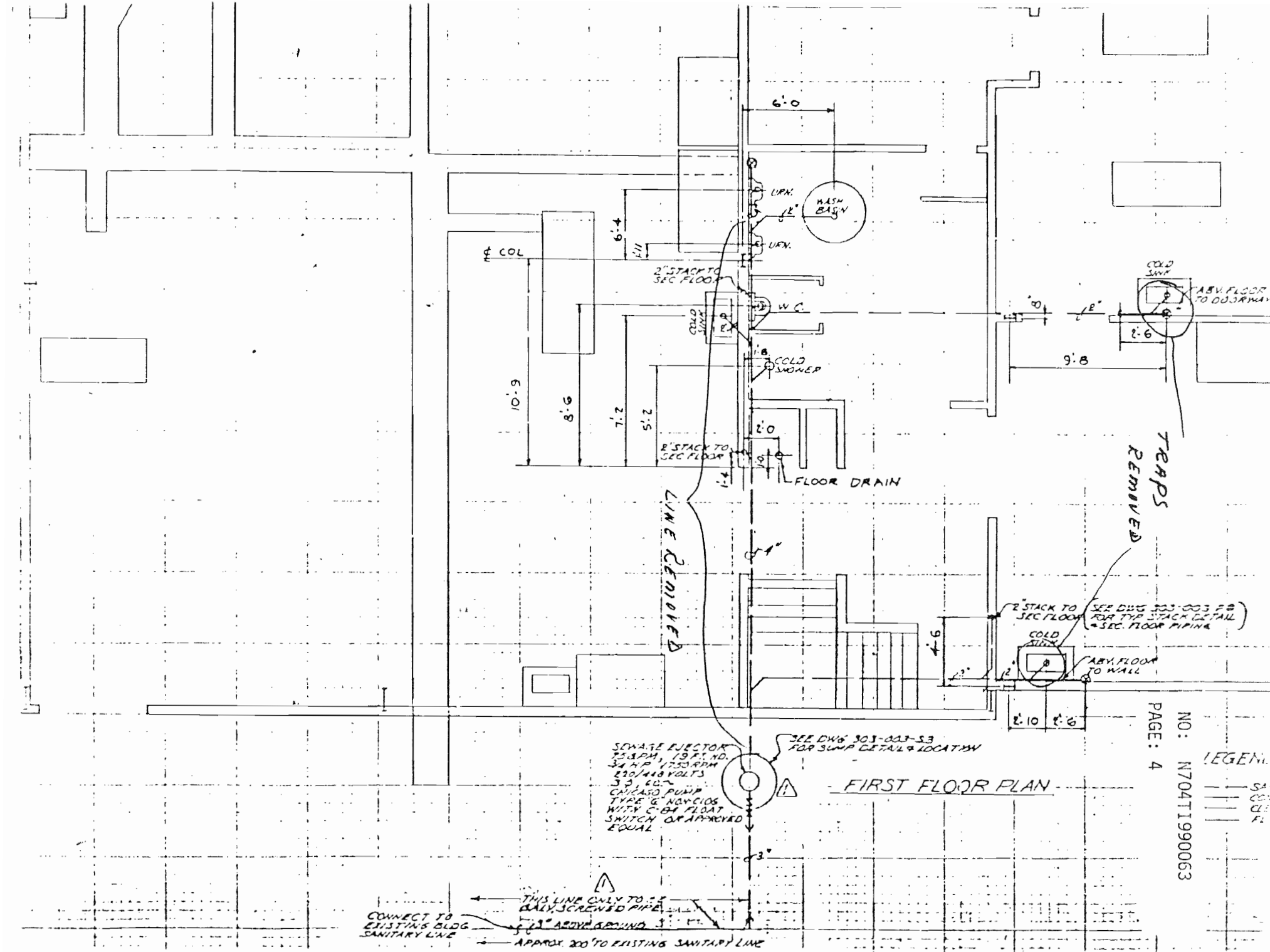
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## I. INTRODUCTION

This document covers the removal of the suspect contaminated sanitary sewer line from Building 003. Building 003 had been given a preliminary release in 1975 (reference AI-ERDA-13158). However, a survey by Argonne National Laboratory (ANL) in 1981 showed some residual contamination, which was decontaminated in February and March 1982. In addition, ANL laboratory analysis indicated suspect contamination located in the building sanitary sewer line. Therefore, the sewer line was removed from the cold sink located in Room 180 through Rooms 160 and 165 up to the sewage sump tank.

Removal of the sewer line began on September 9, 1982, and was completed September 11, 1982. The sewer line was packaged as R/A waste for shipment to offsite land burial.



SQUATE EJECTOR  
 25.5 GPM @ 15 FT. HD.  
 3/4" HP @ 1750 RPM  
 220/440 VOLTS  
 3 PH 60~  
 CHICAGO PUMP  
 TYPE "C" NON-CLOS  
 WITH C-64 FLOAT  
 SWITCH OR APPROVED  
 EQUAL

SEE DWG 303-003-S3 FOR SUMP DETAIL & LOCATION

FIRST FLOOR PLAN

CONNECT TO EXISTING BLDG SANITARY LINE  
 THIS LINE ONLY TO BLACK SCREWED PIPE  
 1/2" ABOVE GRAUND  
 APPROX 200' TO EXISTING SANITARY LINE

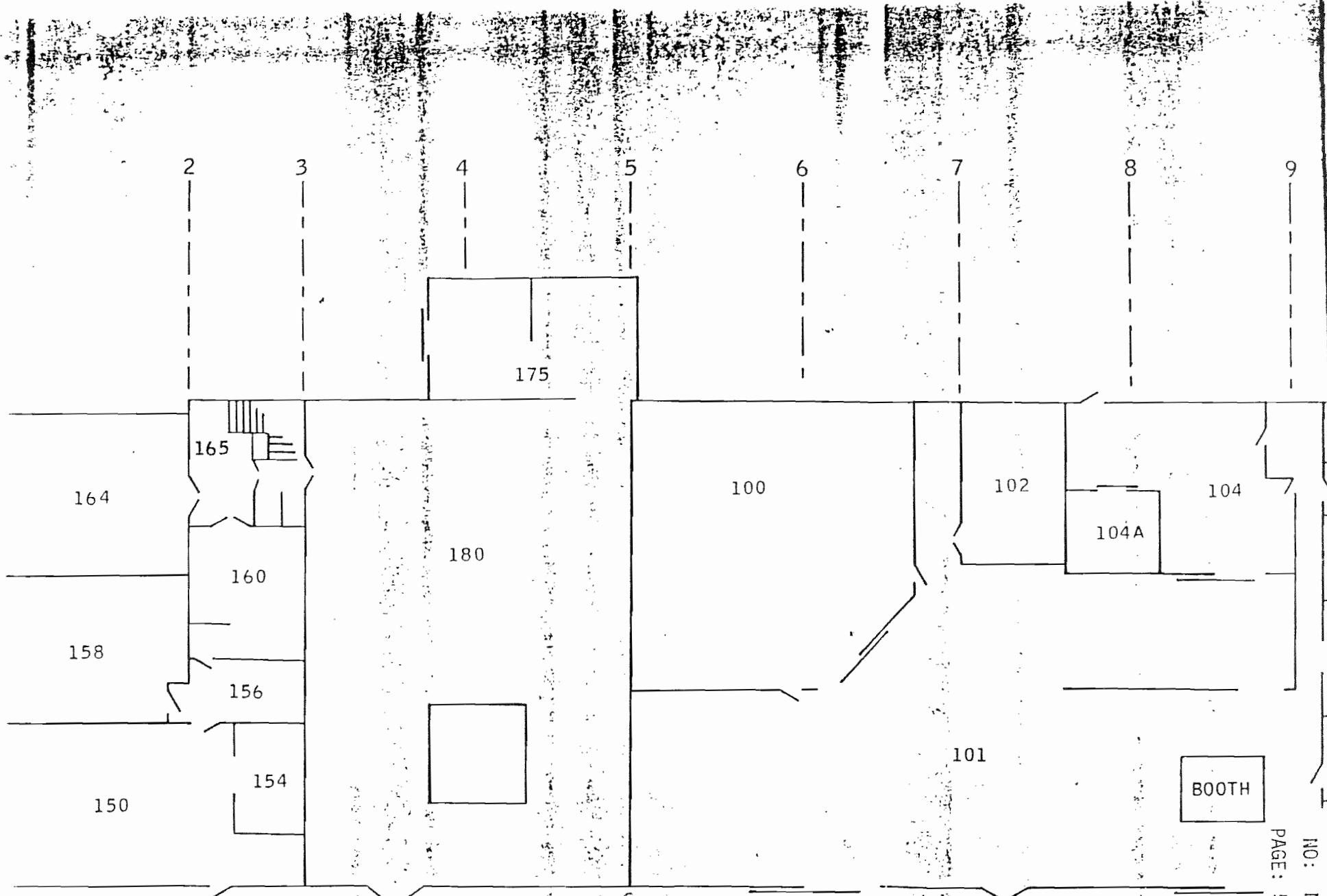
TRAPS REMOVED

2" STACK TO SEC FLOOR  
 (SEE DWG 303-003-S3 FOR TYP STACK DETAIL & SEC. FLOOR PIPING)

PAGE: 4

NO: N704T1990063

LEGEND  
 SA  
 CO  
 CL  
 FL



BLDG. NO. 003

ENGINEERING TEST BLDG. 10,775 SQ' FT



## II. SURVEYS AND RESULTS

### A. SURFACE RADIATION

At the conclusion of the sewer line removal, a survey was conducted using three survey instruments: a Technical Associates Model CP-7 ion chamber detector, an Eberline Model PRM-5-3 low-energy gamma detector, and a Ludlum Model 12 with a thin window pancake GM detector. The low-energy detector and Ludlum GM detector were used for faster response and audible output. An average background reading of 0.03 mrad/hr was recorded in the middle of Room 160 which is a typical reading with this instrument in an uncontaminated area. All readings with the CP-7 were below the Table 1 limit of 0.1 mrad/hr.

TABLE 1  
CONTAMINATION/RADIATION LIMITS

<u>Removable Contamination</u>
20 dpm/100 cm <sup>2</sup> alpha
100 dpm/100 cm <sup>2</sup> beta
<u>Total Contamination (Removable Plus Fixed)</u>
100 dpm/100 cm <sup>2</sup> alpha
0.1 mrad/hr at 1 cm through a
7 mg/cm <sup>2</sup> absorber

### B. SOIL SAMPLES

A total of ten soil samples were collected from the surface of the trench. All ten soil samples were less than 30 pCi/g. In addition, nine more soil samples were collected with Argonne National Laboratory personnel in the same location that ANL sampled. All nine samples were less than 30 pCi/g.

All soil samples were counted on a Nuclear Measurements Corporation automatic counting system. This system is checked daily with calibrated sources and a KCL standard for efficiency.



### III. CONCLUSIONS

In each type of test performed, all samples indicated levels less than those limits prescribed by the decontamination and disposition of facilities program for release for unrestricted use.

All appropriate surveys indicate that current existing radioactivity in the area is below the applicable limits for release for unrestricted use.

# Internal Letter



Rockwell International

03/15/82  
T143

Date: . March 15, 1982

No: .

TO: . (Name, Organization, Internal Address)

. Those Listed

FROM: . (Name, Organization, Internal Address, Phone)

. F. E. Begley  
. 779, 071-NB13

. 3126

Subject: . Radiation Survey of Building T003 - Santa Susana

Following dismantling of the Hot Cave in Building T003 and a radiological survey of that area in 1975 (see AI-ERDA-13158), the building had been given a preliminary release. However, a confirmatory survey by Argonne National Laboratory (ANL) in 1981 showed some residual contamination in various parts of the building. Therefore, a complete instrument and smear survey of Building T003 was performed by F. E. Begley in February and March 1982. Decontamination work associated with this survey was directed by J. F. Lang.

ANL used Eberline PAC-4G-3 survey instruments, and we purchased the following instruments from Eberline so we could conduct the same type of survey.

Eberline PAC-4G-3, Serial 253485, with AC-21B gas flow proportional detector 3797

Eberline PAC-4G-3, Serial 253486, with AC-21B gas flow proportional detector 3798

Eberline Pulse Rate Meter, Serial 253487, with low-energy gamma detector PG-2 253488.

A Sr-90 source (S/N 7886) was used to check the calibration of the PAC-4G-3 instruments. Calibration of the instrument should be checked on a daily basis. The instrument is adjusted to have an efficiency factor of 2, and the area of the probe is 50 cm<sup>2</sup>; therefore, net counts per minute are multiplied by 4 to get dpm/100 cm<sup>2</sup>. The background count rate for the PAC-4G-3 is ~75-125 cpm. A gas flow check was done at the beginning of each survey by flushing the detector probe for 1 minute, turning the control knob to "operate," and lighting the gas flow orifice with a match. A 3/4-in. flame indicated there was sufficient gas flow.

Smears of approximately 100 cm<sup>2</sup> were taken and counted for 1 minute on NMC gas proportional automatic counting system, S/N 354923. Calibration of the counting system is done on a daily basis using Tc-99, S/N 452-80, and Th-230, S/N 11209 sources. Background counts ran approximately 27 cpm β and 1 cpm α, and efficiency factors were approximately 3.66 β and 3.86 α. Exact data can be found in the SRE (T143) daily calibration log.



The following is a synopsis of the actual survey:

- 02/08/82 - A nonradioactive exhaust duct in the former hot cell room was dismantled and disposed of as radioactive waste. The ducting was surveyed and found to be clean except where the two pieces were joined together and went through the roof (200-300 cpm gross).
- 02/09/82 - ANL had been unable to survey the floor in the former fuel assembly room because of the equipment stored on pallets. The pallets were removed, and the floor was surveyed for loose and fixed contamination. None was found.
- 02/10/82 - Pallets were removed from the former machine shop and heating room. The floor was surveyed, and no contamination was found.

A radioactive exhaust duct was removed from the former fuel assembly room and disposed of as radioactive waste in a 19-A box. No contamination was found on the floor.

The air conditioning room over the former machine shop was surveyed. No contamination was found.

A survey of the former hot cell area began on the east wall. Most of the surveying from this point on was done on a man-lift. All reachable (95%) pipes and ledges were surveyed. Contamination was detected in three spots (300, 300, and 500 cpm gross) which were deconned to background levels in the range of 75 to 125 cpm.

The north wall survey in the former hot cell area began. Contamination was found in one spot (300 cpm gross) which was deconned to background levels.

- 02/11/82 - The radioactive exhaust filter plenum and related ducting on the roof of the T003 annex was surveyed inside and out and found to be clean. The outside of the plenum and ducting has been marked with a Marks-A-Lot pen, stating that they have been surveyed with the date and my name, and that no contamination was found.

The roof above the former hot cell area was surveyed. Fixed contamination (225-1000 cpm gross) was detected on the grid platform and the metal roof. This area is directly above the nonradioactive exhaust duct that was found to be slightly contaminated (200-300 cpm gross). (See survey on February 8, 1982.) The platform supports were cut; the platform was lowered to the ground, cut up, and put in a 19-A box as radioactive waste.

North wall survey continued, and one area of fixed contamination (500 cpm gross) was found. This was deconned to background levels.

- 02/12/82 - North wall of the former hot cell area survey continued. One area of contamination (250 cpm gross) was found and was deconned to background levels.

Light fixtures on the north wall were surveyed, and no loose or fixed contamination was found.

Pipes and beams were surveyed and 300 cpm gross was detected in one area. This was deconned to background levels.

- 02/15/82 - A survey of the pipes and beams at the ceiling level of the former hot cell area continued. A piece of insulation hanging from the ceiling was found to be contaminated (300 cpm gross). It was cut out and disposed of as radioactive waste. A further survey of the insulation found no contamination.

Three areas of the bridge crane rail were found to be contaminated (250, 325, 500 cpm gross) and were deconned to background levels.

Light fixtures were surveyed and found to be clean.

Beams and pipes along the south wall were found to be clean.

- 02/16/82 - A survey of the bridge crane rail, pipes, lights, and ledges on the north wall of the former fuel assembly room found no contamination.

A survey of the air conditioning, lights, and pipes on the west wall found no contamination.

A survey of the pipes and ledges on the south wall found no contamination.

- 02/17/82 - The survey of the south wall of the former fuel assembly room continued, and no contamination was found.

The lights, pipes, and ledges along the east wall were surveyed and found to be clean.

About 75-80% of the ceiling in the center of the room was surveyed. Because of the size of the basket on the man-lift, it was impossible to manuever it between the light fixtures up to the ceiling. But, because no contamination was found in the lower levels (except for the section of floor located by ANL), I feel that the area surveyed is sufficient and representative. Incidentally, this floor section had been scabbled prior to my survey and was released as clean.

- 02/18/82 - Returned to former hot cell area and surveyed the bridge crane (90%) and found it to be clean. The man-lift could not be manuevered around the mockup pit for a complete survey.

Surveyed the vacuum furnace pit in the former fuels assembly room and found no contamination.

Instruments ran out of gas. Gas is on order and expected shortly. Smear surveyed low light fixtures along north end of former hot cell room and found 102 dpm/100 cm<sup>2</sup> β<sub>2</sub> on one fixture. This was deconned to <50 dpm/100 cm<sup>2</sup>.

- 03/02/82 - Returned to T003 for final PAC-4G-3 survey of the low light fixtures and found contamination (50,000 cpm gross) on a beam. Requested additional vacuuming of the area before the survey resumed.

- 03/09/82 - Surveyed the remainder of the hot cell area. All surveyed areas were found to be clean.

Both PAC-4G-3 instruments failed near the end of the survey and have been returned to Eberline for repair. There are several drawbacks to the PAC-4G-3. The weight of the instrument requires that you wear it over your shoulder if you are going to survey for a long period of time. A camera strap can be used for this purpose. In addition to the weight,

you must wear a headset at all times. The headset had to be removed and the meter and probe laid down in order to smear an area. For future surveys, a belt could be worn, and the probe could be tucked inside the belt. This will speed up surveying time if the constant odor of propane gas does not become too uncomfortable. The gas can be turned off while obtaining smears, but when it is turned on again, you must light the orifice to check for proper gas flow. This is also time-consuming. Counts begin to drop off slowly when the gas supply is low. The gas bottle is rated for 8 hours, and when you near this time limit, time is wasted by lighting the orifice often to check the gas supply.

A file containing complete survey reports and information pertaining to the survey will be kept on file in the Radiation and Nuclear Safety office.

*F. E. Begley*

F. E. Begley  
Radiation and Nuclear Safety

reg:315

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Radiation and Nuclear Safety (6)