

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 03005679/82-01(DETP)

Docket No. 30-05679

License No. 34-02555-01

Priority IV

Category E

Licensee: Consolidated Rail Corporation
Technical Service Laboratory
577 East 152nd Street
Cleveland, OH 44110

Facility Name: ConRail, Collinwood Yard

Inspection Date: February 16 and August 13, 1982

Inspector: E. R. Matson
Radiation Specialist
E. R. Matson

9/27/82

Approved By: D. J. Sreniawski, Chief
Materials Radiation Protection
Section 2 *D. J. Sreniawski*

9/27/82

Inspection Summary

Inspection on February 16, 1982 (Report No. 03005679/82-01(DETP))

Areas Inspected: Close-out inspection of decontaminated facilities including visual inspection, radiation measurements, and evaluations of smears (wipes) taken at various locations at the licensee's facilities to verify that all licensed material had been disposed of and no residual contamination exists. The inspection involved six inspector-hours onsite by one NRC inspector.

Results: All licensed material was disposed of by the licensee in an authorized manner as noted in licensee's letter dated October 26, 1981, with the enclosed Form NRC-314. No residual contamination was found.

DETAILS

1. Persons Contacted

Ralph Holl, Manager Engineering Services
Fred Hoyt, Maintenance Superintendent

2. Scope of Program

The license, renewed in its entirety on July 12, 1979, currently authorizes the use of sealed sources only for radiography, irradiation, density studies, research and development, instrument calibration, engine wear studies, neutron generator, and light sources. Authorized isotopes include cesium-137, cobalt-60, and hydrogen-3 ranging from 10 curies to 2 millicuries each source.

This facility was first licensed by the Atomic Energy Commission in 1957. In addition to the above, during the years of operation the following isotopes were also used: carbon-14; chromium-51; strontium-90; phosphorous-32; sulfur-35; promethium-147; iron-59; hydrogen-3 as one curie of tritiated water; technetium-99 as liquid; krypton-85 as gas; thorium-232 as 7 pounds of powder; and uranium-238 as 21 pounds of bars and powder.

3. Disposition of Material

- a. On September 15 and 16, 1981, all byproduct, source, and special nuclear material was collected by Environmental Research Group, Inc., of Ann Arbor, Michigan, (NRC License No. 21-14920-01) and shipped by ADCO of Tinley Park, Illinois, (NRC License No. 12-11286-01) to Washington as certified by R. E. Doughty on Form NRC-314 dated October 27, 1981.
- b. The hoods, laboratory bench, and glove box used in the radioisotope laboratory were removed and shipped to a ConRail facility in Altoona, PA.
- c. Based on a visual inspection, radiation survey, and wipe tests, it appears that all radioactive material has been removed from the premises.

4. Confirmatory Survey

NRC confirmatory measurements conducted on February 16, 1982, and August 13, 1982, indicate no radiation fields or removable contamination levels above those listed in Table 1 of Regulatory Guide 1.86. For measurement results and locations of surveys see Attachments A, B, C, and D.

A survey to determine environmental radiation levels was not considered appropriate because of the type and quantity of material used and the facilities showed radiation levels near background.

NRC surveys consisted of measurements for fixed and removable alpha, beta, and gamma radiations. All areas of isotope use were surveyed including the

radioisotope laboratory, engine test cell, and the block house used for waste storage.

Measurements for removable contamination were performed by taking 100 cm² wipes and counting them with a Canberra, Model 2200, Alpha-Beta low level counting system. The results are tabulated in Attachment A, page 1, and are below the NRC levels for unrestricted use. For locations of wipe samples taken see Attachment B, pages 1 and 2

Fixed contamination surveys were performed using a G-M survey meter Eberline Model E-120, NRC Serial No. 007931, calibrated on November 23, 1981. This meter was used with an end window probe Eberline Model HP-190 with a window thickness of 1.4 to 2 mg/cm². Manufacturer's reported efficiencies for beta detection range from 22.5 percent to 5 percent. Also used was an Eberline E-520, G-M survey meter, NRC Serial No. 009574, calibrated on May 20, 1982.

This meter was used with a pancake probe Eberline Model 210 with the same window thickness as above but with beta efficiencies from 45 percent to 10 percent.

Measurements for removable tritium contamination were performed on August 13, 1982, by smearing 100 cm² with dry paper wipes and immediately submersing and sealing them in liquid scintillation vials. The wipes were analyzed by Argonne National Laboratory using liquid scintillation spectrometry. All smears were less than the detection limit of 10 picocuries per smear. See Attachment D. For smear locations see Attachment B, page 1.

5. Burial of Waste

No radioactive material or waste products have been buried on this site. All isotopes were transferred as cited in Paragraph 3.

6. Reports and Records

Records of personnel monitoring and transfer of radioactive material are being maintained by the licensee at ConRail Technical Service Laboratory, Second Street Juniata, Altoona, PA.

7. Conclusion

The inspection revealed all radioactive material has been properly disposed of and no radioactive contamination exists in the facility which exceeds the levels listed in the decontamination guidelines, Regulatory Guide 1.86. A review of licensee's close-out survey dated September 15 and 16, 1981, showed no appreciable differences when compared with NRC findings.

Attachments:

1. Attachment A
2. Attachment B
3. Attachment C
4. Attachment D

ATTACHMENT A, Page 1

February 1982 Dry Wipe Results

Location*		ALPHA	BETA
No. and description		Net dpm/100cm ²	Net dpm/100cm ²
<u>Instrument background</u>		<u>.05 dpm</u>	<u>3 dpm</u>
1	Pit No. 1, metal liner pit walls	1.96	7.65
2	Pit No. 1, lead cover	.54	1.18
3	Pit No. 2, metal liner	4.11	5.88
4	Pit No. 2, lead cover	.54	0
5	Pit No. 3, metal liner	9.82	**12.35
6	Pit No. 3, lead cover	4.11	8.82
7	Pit No. 4, metal liner	0	.59
8	Pit No. 4, lead cover	1.25	6.47
9	metal shelf	.54	0
10	metal cover to pits	.54	0
11	floor	0	0
12	wall over fume hood	0	0
13	hood exhaust duct	1.25	0
14	lab bench drain	.54	1.76
15	hood overflow drain	1.25	0
16	door knob	0	0
17	floor drain	.54	.58
18	floor	0	0
19	engine test cell	0	2.94
20	block house, floor	0	.58
21	block house, floor	0	0
22	block house, wall	0	0
23	block house, floor	.54	.58
24	block house, floor	0	0

*For Location No., see Attachment B, pages 1 and 2.

Instrument efficiencies used for the above calculations are 28 percent efficient for Pu-239 alpha and 34 percent efficient for Cs-137 beta. In addition, the instrument is 9 percent efficient for C-14 beta.

**Assuming the worst case that location No. 5 is contaminated with carbon-14 only, which has the lowest efficiency for counting, that smear would not exceed 80 dpm/100cm². This worst case situation is below NRC release limits for fixed contamination.

ATTACHMENT A, Page 2

Fixed Contamination Survey Results Using E-520 Survey Meter

<u>Location*</u>	<u>Gross cpm</u>
<u>Background in Adjacent Room</u>	<u>20-30 cpm</u>
No. 1 metal shelf	20 cpm
No. 2 drain, floor	25 cpm
No. 3 drain, floor	20 cpm
No. 4 corner	30 cpm
No. 5 floor	20 cpm
No. 6 floor old storage area	30 cpm
No. 7 corner	20 cpm
No. 8 pit No. 1 lid	30 cpm
No. 9 pit No. 2	30 cpm
No. 10 pit No. 3	20 cpm
No. 11 pit No. 4	20 cpm
No. 12 shelf	20 cpm
No. 13 drain	20 cpm
No. 14 under shelf	20 cpm
No. 15 corner	20 cpm
No. 16 floor	30 cpm
No. 17 floor	25 cpm
No. 18 behind door	30 cpm
No. 19 floor	20 cpm

*See Attachment C, page 1 for locations of surveys.

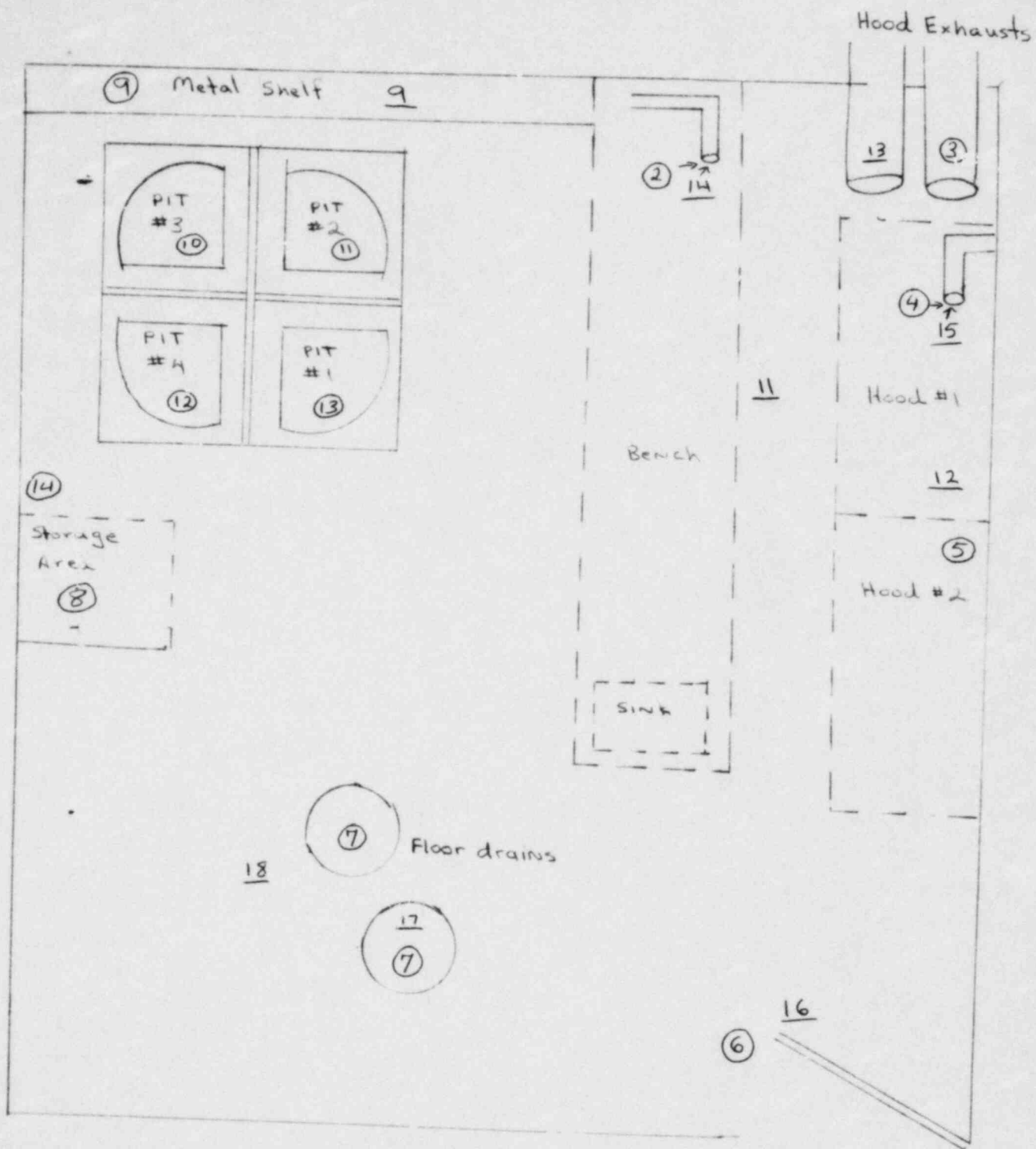
ATTACHMENT A, Page 3

Fixed Contamination Survey Results Using Eberline E-120

<u>Location*</u>	<u>Results in mR/hr</u>
storage pit No. 1 (1)	.03
storage pit No. 2 (2)	.02
storage pit No. 3 (3)	.03
storage pit No. 4 (4)	.03
floor and wall (5)	.03
floor and wall (6)	.03
floor and wall (7)	.01
floor (8)	.03
floor (9)	.02
floor drain (10)	.03
block house floor (11)	.03
block house floor (12)	.03
block house floor (13)	.03
block house floor (14)	.03
block house floor (15)	.03
block house floor and wall (16)	.02
engine test cell (17)	.03

*See Attachment B, page 2, and Attachment C for diagrams of survey locations.

Attachment B, page 1



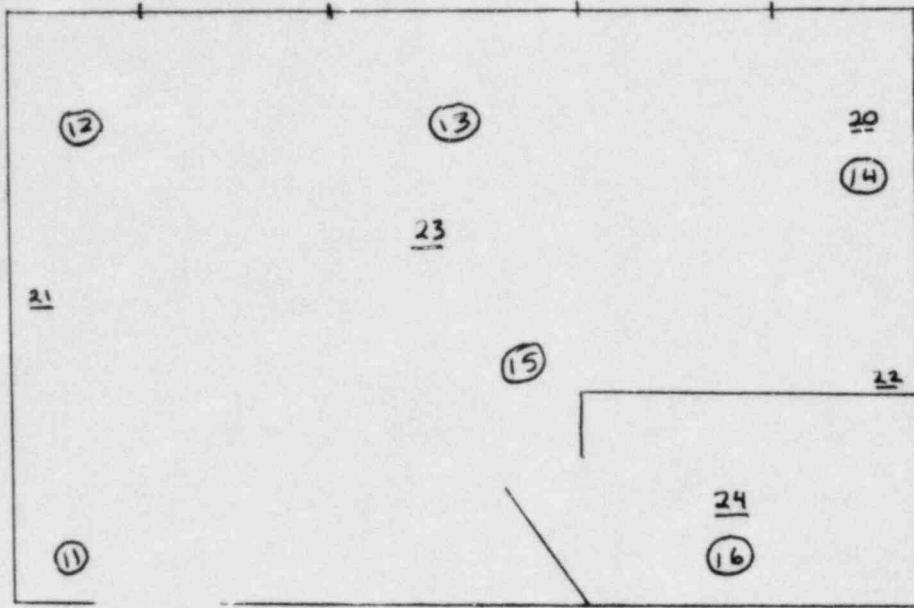
Radioisotope Laboratory

--- indicates items removed prior to NRC survey.

= dry wipe locations

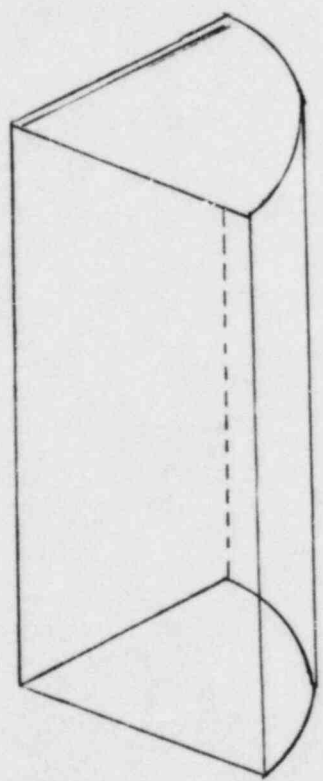
(#) = liquid scintillation wipe locations

Attachment C B, page 2



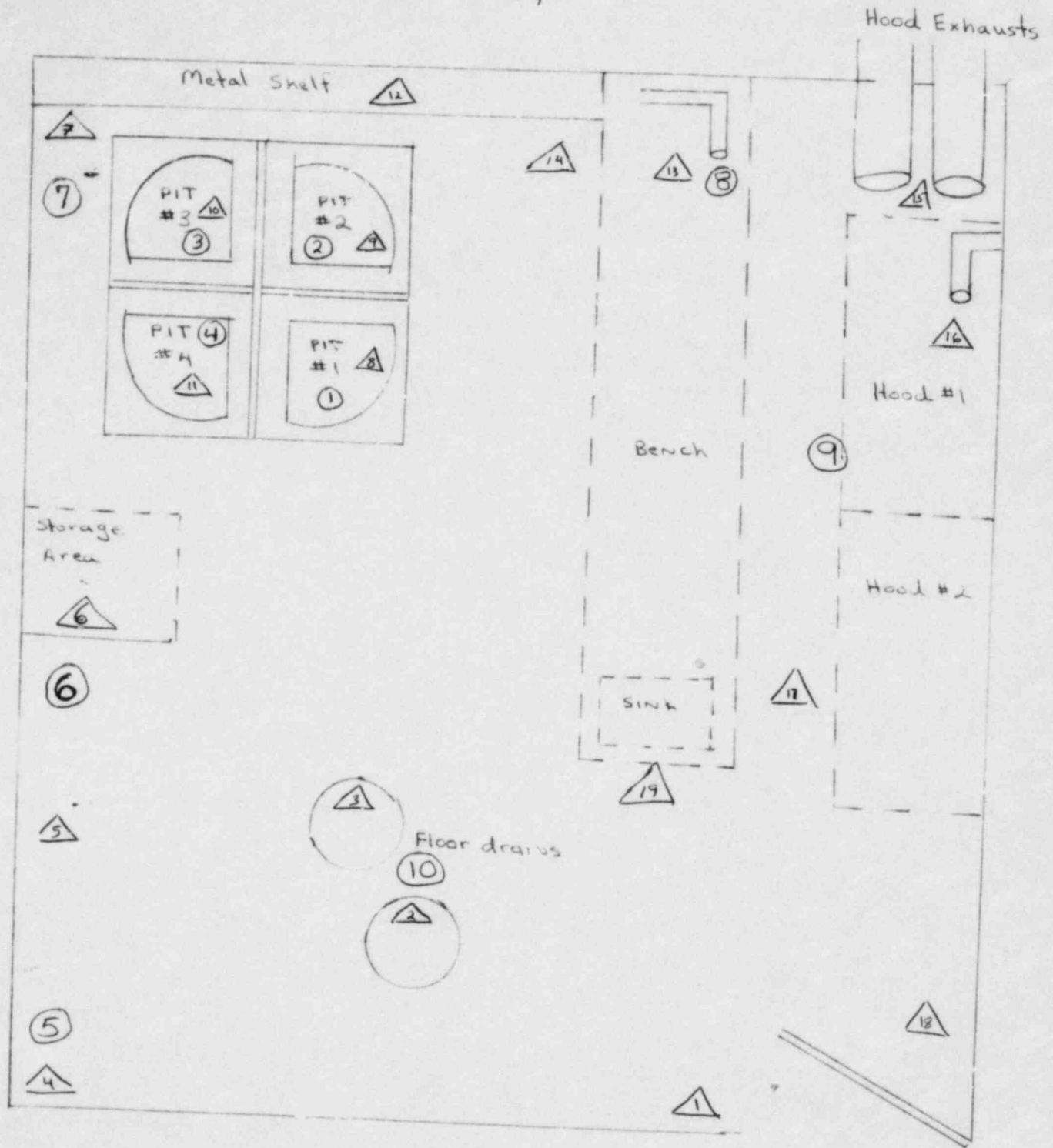
DOOR
Block house

= wipe test location
Ⓜ = G-M survey location



Isotope Lab, storage pit
metal liner

Attachment C,



Radioisotope Laboratory:

--- indicates items removed prior to NRC survey.

☐ = E-120 survey locations

△ = E-520 survey locations

Attachment D

ARGONNE NATIONAL LABORATORY

9700 SOUTH CASS AVENUE, ARGONNE, ILLINOIS 60439

TELEPHONE 312/972-

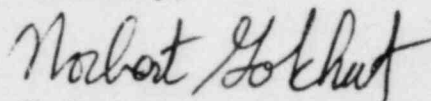
August 27, 1982

Mr. Albert Januska
U. S. Nuclear Regulatory Commission
Region III
799 Roosevelt Road
Glen Ellyn, Illinois 60137

Dear Al:

The analysis of 14 smear samples and a blank, NRC-82-490 to NRC-82-504, for tritium by liquid scintillation spectrometry has been completed. All the smears were less than the detection limit of 10 pCi per smear. If you have any questions, please call.

Sincerely,



Norbert W. Golchert

NWG:reb

Attachment D

AUG 31 1982