

SAVANNA, ILL



General Services Administration - Region 3
230 South Dearborn Street
Chicago, IL 60604

GSA/FPRS/OSM/Zone 2 - 3200 Sheffield Avenue, Hammond, IN 46327

May 9, 1984

U. S. Nuclear Regulatory Commission - Region 3
Attn: Mr. Thor Oberg
799 Roosevelt Road
Glen Ellyn, Illinois 60137

PRINCIPAL STAFF			
EA		DPRP	
D/RA		DE	
/RA			<i>orig + 1</i>
FC			
FAO			
SGA		IL	
ENF		File	<i>ues</i>

Subject: Disposal of Monazite Sand in Tank Storage Tanks 3222I and 3222J - U. S. Naval Administrative Command, Great Lakes, IL

Dear Mr. Oberg:

In our conversation of May 4, 1984, we discussed the disposition of the monazite sand stored in Tanks 3222I and 3222J at U. S. Naval Administrative Command, Great Lakes, Illinois; however, there are three other tanks you should know about.

The three enclosures give the details of the above tanks and also includes information on other tanks that contained monazite sand within our Zone and under our jurisdiction. The three tanks are Tank 905 located at the Savanna Army Depot in Savanna, Illinois and Tanks 1303 and 1305 located at the Ravenna Army Plant in Ravenna, Ohio. Monazite sand which was stored in these tanks was disposed of through our sales office in Washington, D. C. (see enclosure).

After final shipment of the material, a contract was awarded to Health Physics Associates, Ltd. of Highland Park, Illinois to clean, survey and issue Certificates of Compliance per NRC guidelines. Enclosed are copies of their reports.

If there are any questions regarding the above, I can be contacted on FTS 370-5274.

Sincerely,

Harry Szczepanski
Chief, Quality Assurance Branch
Radiological Officer - Zone 2

Enclosures

State
Carl P
who does
he close out of
this issue?
Carl
Materials
Eff

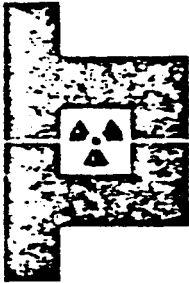
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your action be

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FOREIGN TANK STORAGE OF
 RARE EARTH - MONAZITE SAND
 IN THE GSA/FPRS PROGRAM

<u>LOCATION</u>	<u>TANK I.D.</u>	<u>ORIGIN</u>	<u>NO. OF DRUMS SHIPPED</u>	<u>DATE SHIPPED</u>	<u>NET LBS.</u>	<u>SHIPPED TO</u>
Great Lakes, IL	3222 I	Brazil	881	10/3-11/74	1,209,208	Samin Corp. Inc c/o Yugoslavia
Great Lakes, IL	3222 J	India	1648	8/26-30/74 9/16-20/74	1,768,380	Phillip Bro/ W.R. Grace & Co. Chattanooga, Tenn
Ravenna Army, Ravenna, OH	1303	Brazil	1469	10/10/74	1,899,532	Samin Corp. Inc c/o Yugoslavia
Ravenna Army, Ravenna, OH	1305	India	740	11/19/74	984,630	Phillip Bro/ W.R. Grace & Co. Chattanooga, Tenn
Savanna Army, Savanna, IL	905(formerly ZD-SM-3)	Brazil	196	8/5-9,12,13/74	219,113	Phillip Bro/ W.R. Grace & Co. Chattanooga, Tenn



HEALTH PHYSICS ASSOCIATES LTD. CONSULTANTS IN RADIATION SAF

2356 SKOKIE VALLEY ROAD / HIGHLAND PARK, ILL. / PHONE: AREA (312) 433-

REPORT OF

RADIATION DECONTAMINATION PROGRAM

REPORT PREPARED FOR:

General Services Administration
Federal Supply Service
230 S. Dearborn Street • 33rd Floor
Chicago, Illinois 60604
Attention: Mr. John Trunda

DECONTAMINATION PERFORMED AT:

Savanna Army Depot
Savanna, Illinois
Storage Tank #905

ITEM DECONTAMINATED:

Empty storage tank #905, formerly used to store
about 110 tons of monazite sand (5.5% ThO_2).

DATES OF DECONTAMINATION:

September 25, 26, 1974

SURVEY EQUIPMENT USED:

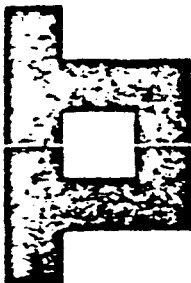
Alpha surveys were made with an Eberline PAC3G
calibrated with a Pu-239 standard.

Beta surveys were made with a Ludlum Model 3GM.
A Gamma approximation was made with a Ra-226
standard.

Gamma surveys were made with a Victoreen 440 or
Eberline GM survey meters.

PERSONNEL:

Donald Sreniawski of Health Physics Associates Ltd.
Harry Szepanski of General Services Administration



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DECONTAMINATION PROCEDURE:

A trench was dug at the entrance to the tank, 3' wide, 4' long, and 2' deep, to collect the water used to hose the tank interior. Since ThO_2 is insoluble in water (see Reference *), the trench was used to collect flushed water. When drained, all residue plus 6" of soil as active waste were removed. Any Thoron with daughters that had been carried in the water would have decayed with a half-life of 10.6 hours or less to stable Lead-208.

Persons who entered the tank wore protective clothing, shoe covers, gloves and half-face respirators. Portions of the walls were scraped to remove sand held by paint, rust spots on the floor and walls were scraped, the floor was swept and then vacuumed to remove the scraped material and monazite sand.

An air sample was taken inside the tank during the scraping operation. The walls, ceiling and floor were hosed with 500 gallons of water at high pressure from a depot fire truck and the water drained into the trench. Excess water was vacuumed. Surveys were taken of the fire hose, tools, and personnel. The residue at the bottom of the trench plus surrounding 6" of soil were removed by shovel into boxes which were transferred to 55-gallon steel drums as active waste.

*Reference

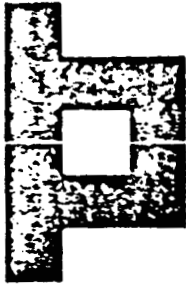
Albert, R.E., "Thorium - Its Industrial Hygiene Aspects," Page 8, Section 2.3, Academic Press, 1966.

RADIATION SURVEYS:

Table I

Pre-decontamination Survey
Figure 1.

<u>Area Surveyed</u>	<u>Maximum Levels Detected</u>		
	Counts per minute per 100 sq. cm.		
	Alpha	Beta	Gamma (mR/hr)
Tank Floor	32,780	37,500	0.6
Walls	16,000	26,000	0.4
Ground	18,000	12,500	0.2



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Table II

Air Sample During Decontamination
Sample Collected

3.4×10^8 cc

1.23×10^{-14} uCi/cc

Table III

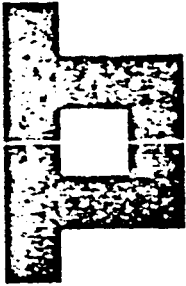
Post Decontamination Survey (Total)

<u>Area Surveyed</u>	Maximum Levels Detected		
	Counts per minute per 100 sq. cm.		
	Alpha	Beta	Gamma (mR/hr)
Tank Floor (Fig. 2,4)	983	7500	0.1
Tank Walls (Fig. 3,5)	328	6250	0.1
Ground Level (Fig. 2)	328	3125	0.07

Table IV

Post Decontamination Survey (Removable)

No.	Area Surveyed (Fig. 6)	Alpha Levels in dpm/100 cm ²	
1	Floor	491 ±	13
2	Post	72 ±	5
3	Wall	204 ±	8
4	Floor	241 ±	9
5	Wall	115 ±	7
6	Floor	78 ±	6
7	Wall	157 ±	8
8	Floor	410 ±	12
9	Floor	678 ±	15
10	Floor	573 ±	14
11	Floor	254 ±	9
12	Wall	144 ±	7
13	Floor	370 ±	11
14	Wall	327 ±	11
15	Floor	344 ±	11
16	Wall	242 ±	9
17	Floor	810 ±	16



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Table V

Soil Sample Analysis
(Figure 7)

<u>Location of Sample</u>	<u>Level of Contamination</u> pCi/gm
1. At entrance before decontamination	120 ± 14
2. At entrance after decontamination	27 ± 4
3. Contaminated ground area •	•3460 ±139
4. Clean ground area	13 ± 2

Table VI

Personnel and Equipment Survey

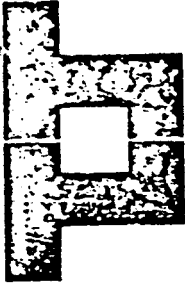
	Alpha cpm/100 cm ²	Beta cpm/100 cm ²
Harry Szepanski	< 100	< 100
Donald Sreniawski	< 100	< 100
Fire hose	< 100	< 100
Tools and Equipment	< 100	< 100

Table VII

Personnel Exposure

	Dosimetry	Film Badge
Harry Szepanski	< 5 mR	M *
Donald Sreniawski	< 5 mR	M

*M = < 10 mR



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CONCLUSIONS:

Surveys were taken with 4 mg/cm^2 window for beta levels and $<1 \text{ mg/cm}^2$ window for alpha levels. All cpm reading should be multiplied by 2 for 4pi dpm levels.

All areas surveyed at termination of decontamination are less than "diminimous levels" as stipulated by the AEC for release to restrictive public use. Restrictive may be defined as for other than storage and/or preparation of food, cosmetics or similar products.

Respectfully submitted,

HEALTH PHYSICS ASSOCIATES LTD.

Donald H. Sreniawski
Health Physicist

Approved by

W.B. Rivkin
Vice President

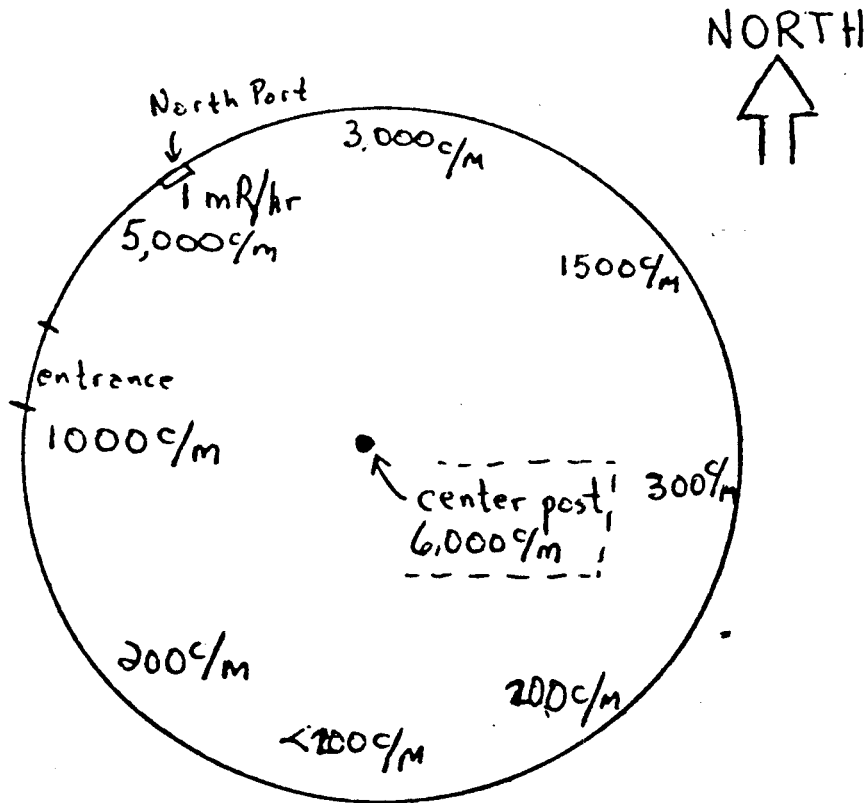


FIGURE 1. β survey of tank floor

for conversion of β to γ data use table I (below)

Table 1. Calibration of Ludlum Model 3 GM w/R₂Z:

mR/hr	c/m
0.055	500
0.1	1,100
0.2	2,000
0.5	5,000
1.0	10,000

FIGURE TWO - β SURVEY OF FLOOR & GROU

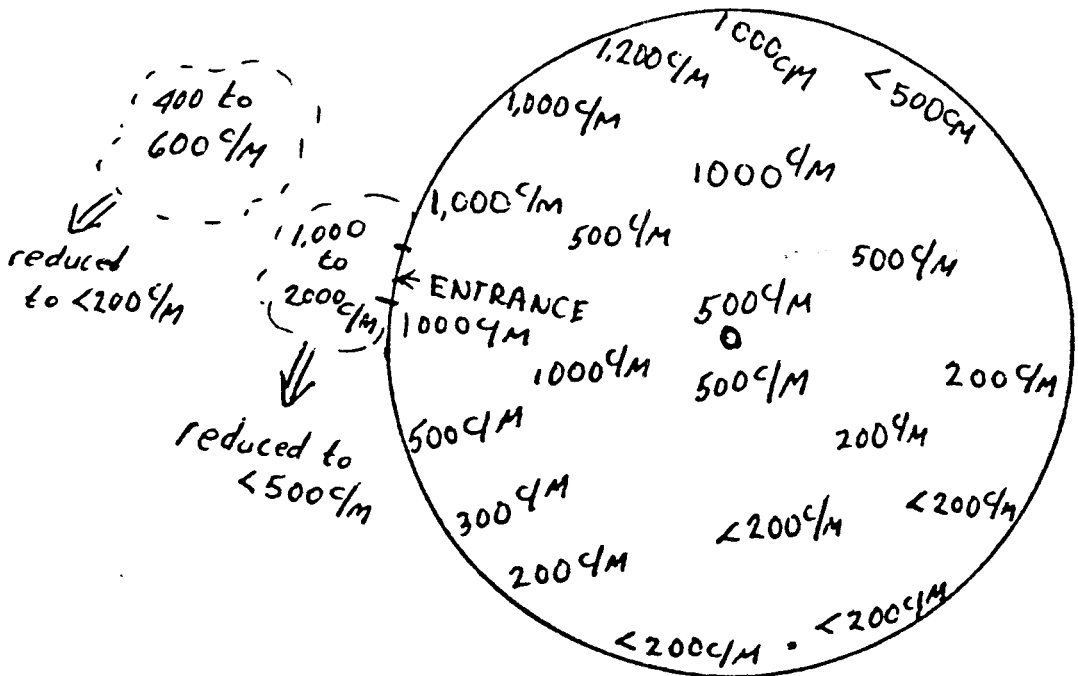


FIGURE THREE - β SURVEY OF WALLS

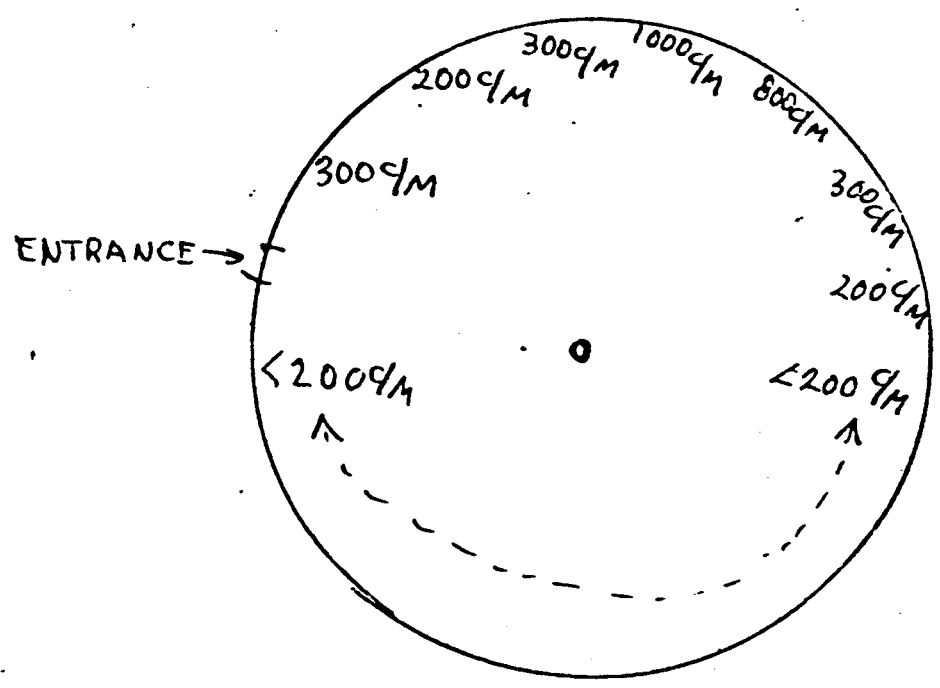


FIGURE FOUR - & SURVEY OF FLOOR

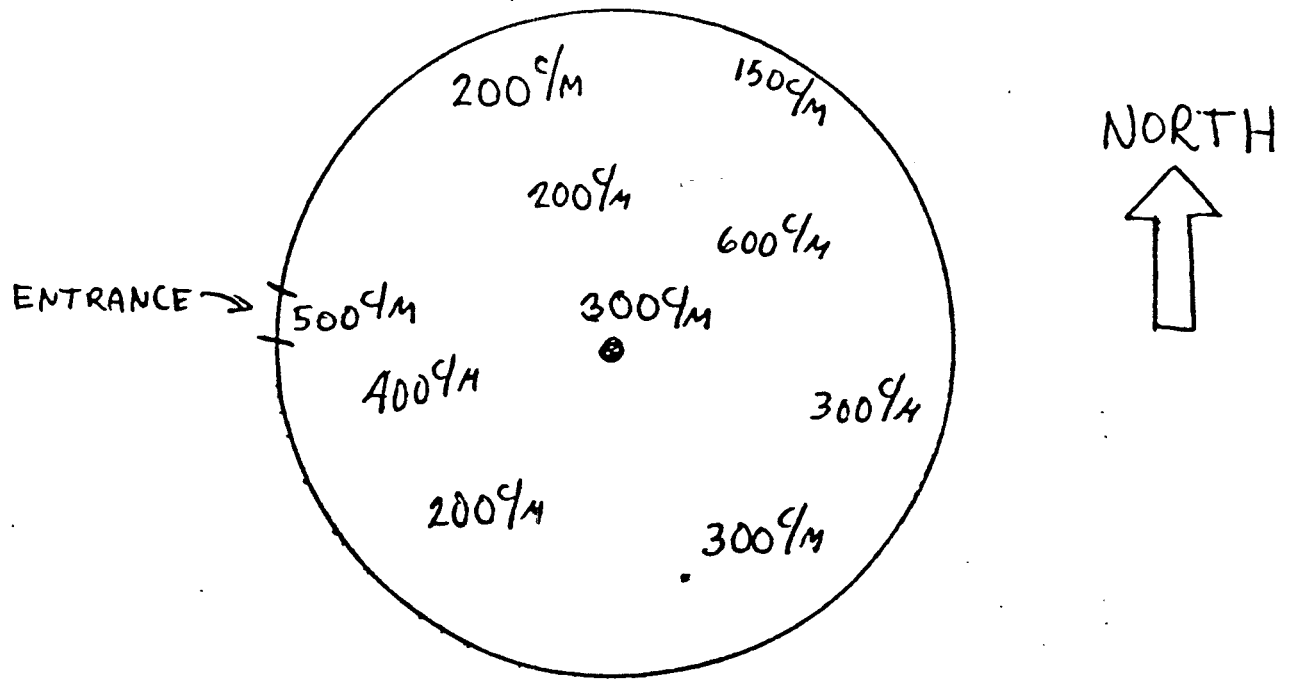


FIGURE FIVE - & SURVEY OF WALLS

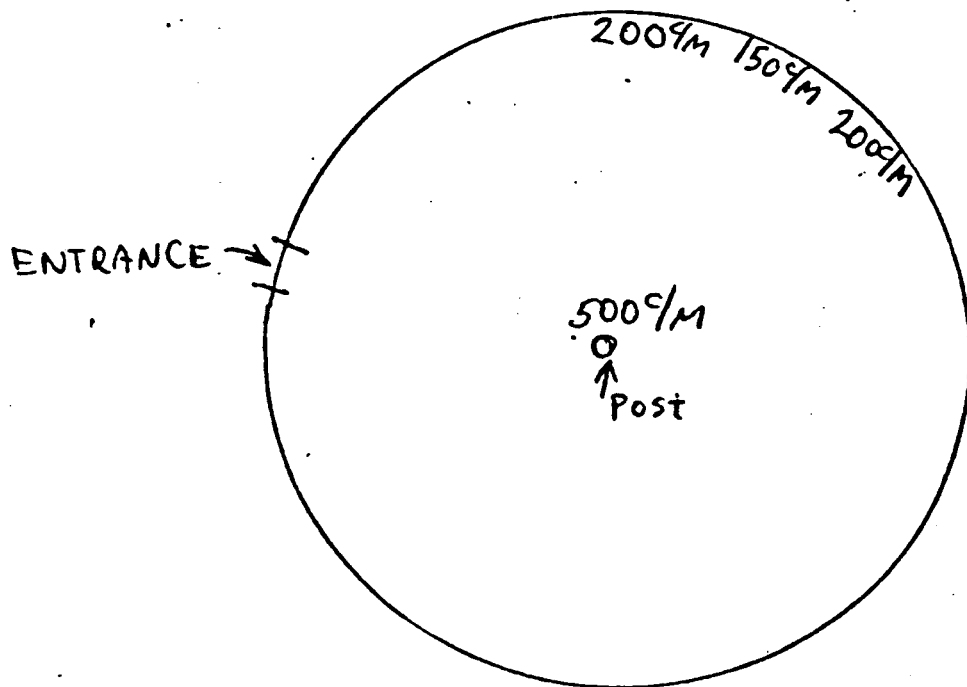
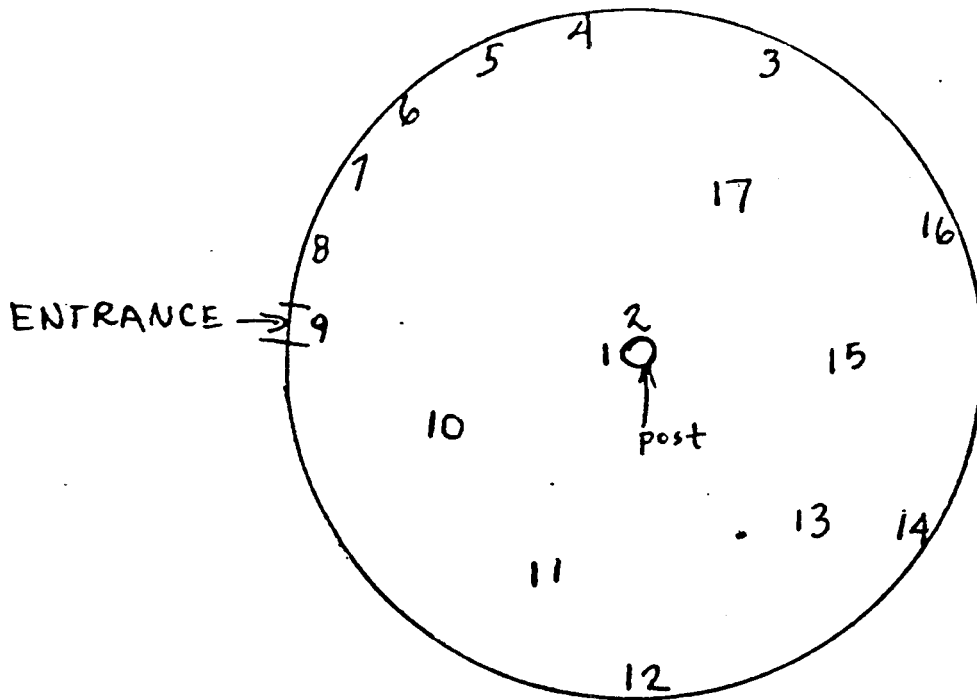


FIGURE SIX - SMEAR LOCATIONS

EACH SMEAR $\approx 300 \text{ CM}^2$

NORTH
↑



1) Floor -

2) Post -

3) wall -

4) floor -

5) wall -

6) floor -

7) wall -

8) floor -

9) floor -

10) floor -

11) floor -

12) wall -

13) floor -

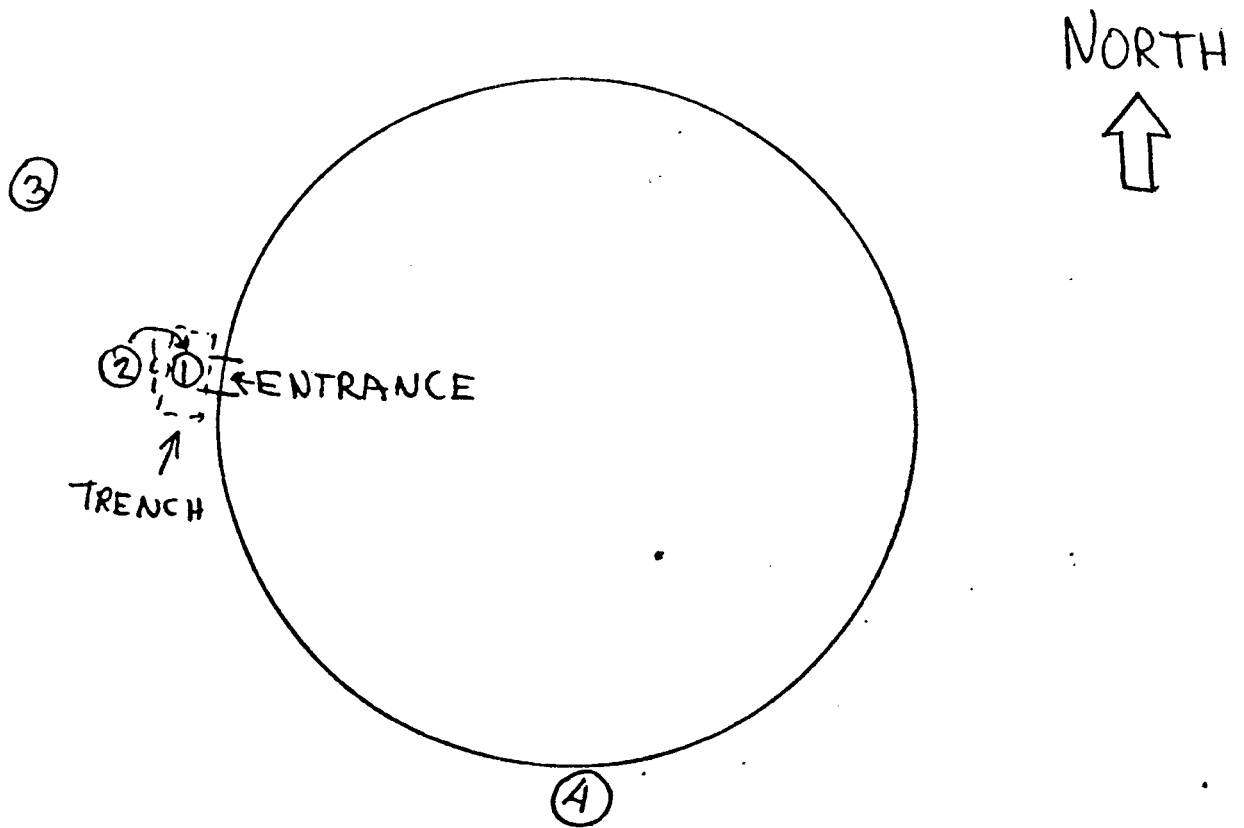
14) wall -

15) floor -

16) wall -

17) floor -

FIGURE SEVEN - SOIL SAMPLES



① SOIL SAMPLE BEFORE DECONTAMINATION.

② " " AFTER " "

These two sample ① & ② were taken in op trench.

③ CONTAMINATED GROUND AREA ,

④ " CLEAN " " "