



April 4, 2001
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VIA EXPRESS MAIL SERVICE

Ms. Mary Adams (in Duplicate)
Licensing Section 1/Licensing Branch
Division of Fuel Cycle Safety
and Safeguards, NMSS
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Subject: **Docket No. 70-734; SNM-696: Request to Release Certain Portions of General Atomics' Facility to Unrestricted Use and Delete them from License: Namely, the Building 2 Service Corridor Drain Line Trench**

and

ATTN: Dr. Ronald Rogus (in Duplicate)
State of California
Department of Health Services
Radiologic Health Branch Mail Stop 178
601 North 7th Street
Sacramento, CA 95814-0208

Subject: **Radioactive Materials License No. 0145-37: Request to Release Certain Portions of General Atomics' Facility to Unrestricted Use and Delete them from License: Namely, the Building 2 Service Corridor Drain Line Trench**

Dear Ms. Adams and Dr. Rogus:

As you are aware, General Atomics (GA) is continuing its efforts to decontaminate, as appropriate, and obtain the release to unrestricted use of selected facilities and land areas on its site. Most recently, GA completed the Final Radiological Survey of a trench inside the service corridor of Building 2. The trench was created during removal of the underground drain lines associated with the sewerage system within Building 2. The resulting sewer line trench runs through the entire service corridor (see attached figure) for a total length of approximately 1,030 feet.

Some of these sewer drain lines were known to be radioactively contaminated. Because of this, and the fact that the lines were mainly cast iron pipes which were deteriorating, it was decided to conservatively assume that the drain lines were contaminated, and to remove and replace all of the drain lines with new, plastic pipe. The cast iron pipes which were removed in sections at a time, are being disposed of as low level radioactive waste.

During the removal of the drain lines, the concrete floor was cut in sections and the concrete and top soil removed in order to expose the underground drain lines. The concrete and soil removed were placed in GA's Temporary Soil Staging Area, Bins T-48 and T-31, respectively. The concrete and soil in these bins were subsequently surveyed and released by the NRC to unrestricted use by letter dated November 16, 2000 signed by Ms. Mary Adams.

Radiation measurements inside the trench were taken on both the bottom and the sides of the trench. Additionally, a total of 104 soil samples were collected from the bottom of the

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trench and analyzed by gamma spectroscopy. These results are summarized in the enclosed report titled, "General Atomics' Final Radiological Survey Report for the Building 2 Service Corridor Drain Line Trench," dated March 2001. The results of these surveys and analyses demonstrate that this trench meets the NRC- and State- approved criteria for release to unrestricted use.

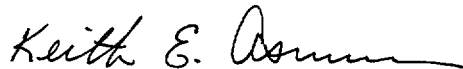
The drain line trench is currently covered with large plywood boards. However, due to safety and other concerns, GA would like to backfill the trench with clean soil and pour a new concrete floor as soon as possible. The remainder of the Building 2 service corridor will be the subject of a future separate release request.

Accordingly, GA hereby requests that the NRC release the trench to unrestricted use and allow GA backfill the trench as soon as possible. GA believes that it is appropriate for the NRC to take the lead regulatory oversight role for the release of GA's Building 2 service corridor, including conducting confirmatory surveys, (if deemed appropriate), for the following reasons:

- (1) The NRC took the lead on the last groups of labs released in Building 2,
- (2) NRC licensed materials were used in a many of the labs in Building 2,
- (3) The NRC took the lead in surveying and releasing the concrete and soil which came from this trench (SSA Bins T-31 and T-48), and
- (4) The NRC has already surveyed other trenches in Building 2 (e.g., three trenches which were lead outs from the main sewer drain lines were surveyed and sampled by NRC; which allowed GA to backfill those trenches).

If you should have any questions regarding this information, please contact Laura Q. Gonzales at (858) 455-2758, or me at (858) 455-2823. Your assistance in responding to our request is very much appreciated.

Very truly yours,



Keith E. Asmussen, Ph.D., Director
Licensing, Safety and Nuclear Compliance

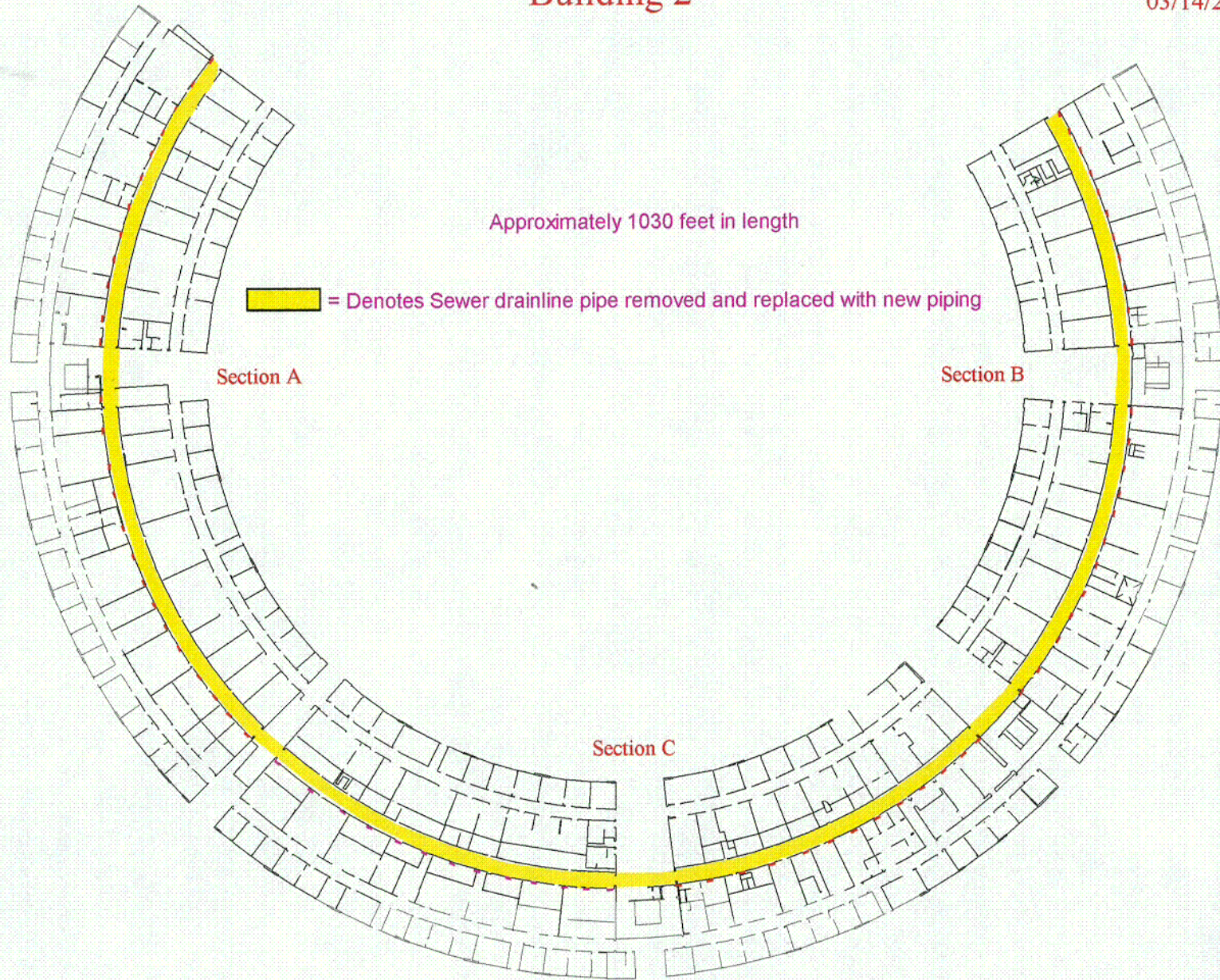
Attached Figure: Building 2 Service Corridor Drain Line Trench

Enclosure: Report titled: "General Atomics' Final Radiological Survey Report for Building 2 Service Corridor Drain Line Trench," dated March 2001.

cc: Dr. D. Blair Spitzberg, Chief, NMSS Branch 3, Region IV
Mr. Wayne L. Britz, Fuel Cycle Inspector, NRC Region IV
Mr. Emilio Garcia, Fuel Cycle Inspector, NRC Region IV
Ms. Kathleen Henner, State of CA, Brea, CA

Building 2

03/14/2001





FINAL RADIOLOGICAL SURVEY REPORT FOR THE BUILDING 2

SERVICE CORRIDOR DRAIN LINE TRENCH

Prepared by: Laura Gonzales, Paul R. Maschka and Cornelius Stanley

March 2001

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Introduction

General Atomics (GA) is continuing its efforts to decontaminate, as appropriate, and obtain the release to unrestricted use of selected facilities and land areas on its site. GA has completed the Final Radiological Survey of a trench inside the service corridor of Building 2. The trench was created during removal of the underground drain lines associated with the sewerage system within Building 2 (See Figure 1). Some of the drain lines were known to be radioactively contaminated. Because of this, and the fact that the lines were old and deteriorating, it was decided to remove all of them and dispose of them as radioactive waste. The drain lines were removed and replaced (with new plastic pipe) in sections at a time. The resulting sewer line trench runs though the entire service corridor (see Figure 2A), for a total length of approximately 1,030 feet.

After approval to backfill the trench has been received from the NRC, GA will backfill the trench with clean soil and pour a new concrete floor. A request to release the rest of the service corridor in Building 2 will be submitted sometime in the future. At the current time, it is important, for safety and other reasons, to backfill the trench caused by the drain line removal project.

This report documents the results of radiological measurements and gamma spectroscopy analyses of 104 soil samples collected from inside the trench after removal of the drain lines. The results of the surveys and analyses performed demonstrate that the trench meets the NRC- and State- approved criteria for release to unrestricted use. A summary of the results is provided in this report.

Site Description

A plan view of the site is provided in Figure 1. Figure 2A shows the location of the trench in the service corridor.

The concrete floor in the service corridor was surveyed and contaminated areas were cleaned to levels below the approved release criteria. The floor was then cut into slabs and the concrete and top soil removed in order to expose the underground drain lines. The concrete and soil removed were placed in GA's Temporary Soil Staging Area, Bins T-48 and T-31, respectively. These bins have been surveyed and released by the NRC to unrestricted use by letter dated November 16, 2000 signed by Ms. Mary Adams. The underground drain lines which were mainly cast iron pipes, were removed and disposed of as radioactive waste and new plastic pipe installed. Post drain line removal (PDRL) soil samples were collected from the bottom of the trench in order to determine whether the soil was contaminated. Soil samples were processed (rocks and other debris removed, soil samples dried and weighed) and counted by gamma spectroscopy for at least 30 minutes.

Criteria for Release to Unrestricted Use

Exposure Rate Guideline

The guideline value for exposure rates measured at 1 m above the surface, is 10 μ R/hr above background levels.

Soil Release Criteria

The predominant radionuclides found in soil at GA and the soil release criteria (above background concentrations) in pCi/g for each of these radionuclides is provided below:

Cs-137	15 pCi/g
Co-60	8 pCi/g
Thorium (Th-228 + Th-232)	10 pCi/g
Enriched Uranium (U-234 + U-235)	30 pCi/g
Depleted Uranium	35 pCi/g

If more than one radionuclide exists, the sum of the fractions of the concentrations is calculated as follows:

$$\sum_{i=1}^n \frac{C_i}{L_i} < 1$$

- Where C_i = The average concentration of radionuclides i in the soil above background levels.
 L_i = The release criteria for radionuclides i .

The sum of the fractions must be less than one in order for the soil to meet the release criteria.

The U-235 concentrations determined by gamma spectroscopy will be used to ensure that concentrations of enriched uranium are below the given limit. The ratio of U-234 to U-235 is conservatively assumed to be ~ 30:1. The depleted uranium is estimated based on the amount of U-238 present since most of depleted uranium is U-238.

Instrumentation

The only instrument used for exposure rate measurements was a calibrated microR meter (serial number 123930) manufactured by Ludlum Measurements which has a RCA 6199 coupled to a 1" x 1" NaI (TI) Scintillator. It has five ranges which go from 0-5 mR/hr and a typical background reading (measured at 1 m above the surface) of 10-18 μ R/hr, unless building materials, geometry or other factors are involved. Exposure rate meters are calibrated quarterly.

Previous Activities (History of Use)

Building 2 used to house GA's Science Laboratories which were involved mainly in research and development. Under normal operations, liquid radioactive waste was not permitted to be disposed of into the sanitary sewerage system. However, trace quantities could enter the sewerage system by the washing of glassware or other materials and supplies. As a result of this and because the sewer drain lines were old, the sewerage system was assumed to be contaminated (and measurements confirmed that a few portions of the system were contaminated). Consequently, the drain lines were removed and disposed of as radioactive waste.

Final Survey Plan

Objectives and Responsibilities

The objectives of the final survey plan were (1) that the exposure rates are less than 10 μ R/hr above background measured at 1 meter above the surface, and (2) that the soil concentrations were below the approved soil release criteria.

Surveys were taken only by qualified Health Physics Technicians having a minimum of three years Health Physics experience in accordance with approved Survey Plans. Samples were counted in GA's Health Physics Laboratory which maintains an effective QA program.

The Survey Plan included (1) exposure rate surveying and (2) analyses of soil samples prior to and after the removal of the drain lines. The "prior to" samples represent soil that was stored in the SSA and has since been released by the NRC to unrestricted use. The results of soil samples collected after removal of the drain lines are provided in this report. In addition, the Survey Plan required that 100% of the bottom surface of the trench and 10% of the sides of the trench be scanned using a microR exposure rate meter.

Classification of Area

There was potential for the drain lines to have leaked and the soil to become contaminated. For this reason, the trench was surveyed as a suspect affected area which required samples to be taken ~ every 5 m (~15 feet) and the bottom of the trench scanned so that 100% coverage was obtained. The potential for the side of the trench to be contaminated was much less, therefore, only 10% of the sides needed to be scanned.

Final Survey Results

Soil Samples

Table 1 provides the gamma spectroscopy results of the 104 post drain line removal soil samples. All of the results are well below the applicable release criteria. The approximate locations where these soil samples were collected are shown in Figure 2B. The results are not discernable from background soil concentrations (see background pit soil sample results below).

Activation Product Concentrations - Evaluation

The maximum Cs-137 detected in any of the soil samples measured 0.41 ± 0.06 pCi/g (sample ID B2 C55-3). Co-60 was not detected in any of the soil samples (concentrations were < 0.1 pCi/g based on a 30 minute count and the 500 ml marinelli beaker sample geometry). See Table 1.

Therefore, the sum of the fractions assuming these concentrations were present, but not measured, is as follows: $0.1 \text{ pCi/g Co-60}/8 \text{ pCi/g (limit)} + 0.41 \text{ pCi/gm Cs-137 (maximum concentration found)}/15 \text{ pCi/g (limit)} \approx 0.02$ or $\approx 2\%$ of the limits.

Thorium Concentrations - Evaluation

All thorium results were at or near normal background levels and well below the 10 pCi/g limit. A comparison of the thorium soil concentrations for the trench soil samples with the thorium soil concentrations of the background pit samples indicates that the trench thorium concentrations are at or near background levels.

Enriched Uranium Evaluation

All soil sample results were not discernable from background radiation levels for a 30 minute count; the maximum U-235 concentration in a soil sample was 0.38 pCi/g (soil sample ID B2 C54) and the maximum U-235 concentration in a background soil sample was 0.34 pCi/g, see Tables 1 and 2, respectively.

An evaluation of the soil samples results was performed (beyond reporting that the results are below the release criteria). The highest U-235 concentration was 0.38 pCi/g. For a 30 minute count, this value is not discernable from background. However, without subtracting background (assuming that this concentration is all due to contamination rather than background radiation), the maximum enriched uranium possible is as follows:

The enriched uranium limit (30 pCi/g) applies to the sum of the U-234+U-235 concentrations after background concentrations are subtracted. For enriched uranium, the ratio of U-234:U-235 can be as high as 30:1. Assuming a ratio of 30:1 (conservative), the maximum enriched uranium present when 0.38 pCi/g of U-235 is measured (without background subtraction) is 11.78 pCi/g (0.38 pCi/g of U-235 plus 11.4 pCi/g U-234); $11.78/30 \approx 0.39$ or $\approx 39\%$ of the limits. If background is subtracted, then the value becomes much less than 39% of the limits.

Depleted Uranium Evaluation

The maximum U-238 concentration (which is either natural uranium or depleted uranium), was 3.67 pCi/g (see Table 1). The maximum U-238 concentration in a background soil sample was 3.32 pCi/g. See Tables 1 and 2, respectively.

An evaluation of the soil samples results was performed (beyond reporting that the results are below the release criteria). The highest U-238 concentration was 3.67 pCi/g. For a 30 minute count, this value is not discernable from background. However, without subtracting background (assuming that this concentration is all due to contamination rather than background radiation), the maximum depleted uranium possible is 3.67 pCi/g; the limit for depleted uranium is 35 pCi/g. Therefore, this result, without background subtraction, is $\approx 10\%$ of the allowable limits.

Trench Exposure Rate Survey

Exposure rate surveys were performed on the soil surfaces of the trench. Scans covering essentially 100% of the soil surfaces along the bottom of the trench were performed. Scans covering about 10% of the soil surfaces of the walls of the trench were also conducted. The results of these scans are provided in Figures 3 through 8. The highest surface reading was 30 $\mu\text{R/hr}$ on the sides of the trench along I-beam B45. The exposure rate surface readings ranged from 20-30 $\mu\text{R/hr}$. These readings are consistent with background readings taken inside the "background pit" described below.

Background Pit Exposure Rate Measurements and Background Soil Sample Results

Background

A 4' x 4' x 4' hole, called the "background pit" was previously dug in a non-impacted area on GA's site called the Torrey Pines West Land Area on February 17-18, 2000. The underlying clay substrate was exposed in the pit. The background pit was used to gather background data in a similar environment as the data collected inside the trench of the Building 2 service corridor. Radiation levels inside a hole or trench are naturally higher than they are on the soil surface due to the geometry of a trench. GA could then show that the radiation readings and uranium and thorium soil concentrations were due to naturally occurring radioactivity and not due to GA activities involving the use of radioactive materials.

Location of Pit

The approximate location of the background pit in the Torrey Pines West Land Area is shown in Figure 9.

Surveys Performed and Results

Measurements were taken in the "background pit" with two types of radiation survey instruments. The instruments used and the results of the measurements are as follows:

- 1) For the Ludlum Model 19 with a 1" X 1" NaI(Tl) detector, exposure measurements ranged from 13 - 14 $\mu\text{R/hr}$ outside the pit and 21 - 25 $\mu\text{R/hr}$ inside the pit as shown in Figure 10.
- 2) For the Ludlum Model 3 with the 2" X 2" NaI(Tl) detector, exposure rate measurements ranged from 13 - 15 $\mu\text{R/hr}$ outside the pit and 25 - 27 $\mu\text{R/hr}$ inside the pit (contact) as shown in Figure 11. An exposure rate measurement taken 1 m from the pit soil surface (taken at the center of the pit) read 20 $\mu\text{R/hr}$ (as shown in Figure 11).

A study was also conducted using three different types of pipe; pvc, steel and aluminum. The pipes were each 6" in diameter and were buried in a vertical position with the deep end being 6' below the surface of the ground. This was done in the Torrey Pines West area. Radiation dose rate measurements were taken inside the pipes and the readings were as high as 31 $\mu\text{R/hr}$ inside the pipes. This is significantly higher than the normal background of 15 $\mu\text{R/hr}$ measured 1 m above the soil surface. The dose rate varied depending upon the type of pipe being used with the steel pipe providing more shielding than PVC or aluminum. See Figure 10.

A total of 21 soil samples were collected from the inside of the background pit and analyzed by gamma spectroscopy to determine natural uranium and thorium concentrations in clay soil. The locations are shown in Figure 12 and the results are provided in Table 2.

Conclusion

The exposure rate surveys and the results of soil samples collected from the bottom of the drain line trench in GA's Building 2 service corridor demonstrate that the radiation levels inside the trench (formed after removal of the underground sewer drain line pipes) are well below the-NRC- and State- approved release criteria for unrestricted use.

After approval to backfill the drain line trench in GA's Building 2 service corridor has been received from the NRC, GA will backfill the trench with clean soil and pour a new concrete floor. The rest of the Building 2 service corridor will be requested to be released sometime in the future.

**TABLE 1: Gamma Spectroscopy Results of Soil Samples Collected Post Drain Line Removal in the Building 2 Service Corridor
From The Period September 1999 through February 2001**

Sample ID	Beam Column Sample Location	Radionuclide Concentration (pCi/g) - Results $\pm 2\sigma$ - Background not Subtracted - 30 minute counts							Evaluation and Comments
		¹³⁷ Cs 662 keV peak	⁶⁰ Co Average of 1173/1332 keV peaks	²²⁸ Th Average of 238/583 keV peaks	²²⁸ Ra (²³² Th) Average of 338/911 keV peaks	Total Thorium ²²⁸ Th + ²³² Th	²³⁸ U 92.77 keV peak	²³⁵ U 186 (144) keV peak	
B2 A2	A2 PDLR	ND	ND	1.31 \pm 0.12	2.06 \pm 0.42	3.36	2.70 \pm 0.93	0.23 \pm 0.26	Below Release Criteria
B2 A3	A3 PDLR	ND	ND	1.37 \pm 0.14	2.06 \pm 0.40	3.43	3.67 \pm 0.99	0.19 \pm 0.07	Below Release Criteria
B2 A4	A4 PDLR	ND	ND	1.21 \pm 0.12	1.88 \pm 0.35	3.09	2.09 \pm 0.59	0.23 \pm 0.06	Below Release Criteria
B2 A5	A5 PDLR	0.14 \pm 0.06	ND	1.14 \pm 0.30	2.02 \pm 0.44	3.16	2.51 \pm 0.81	0.24 \pm 0.06	Below Release Criteria
B2 A6	A6 PDLR	ND	ND	1.15 \pm 0.11	1.61 \pm 0.42	2.76	2.78 \pm 0.73	0.16 \pm 0.08	Below Release Criteria
B2 A7	A7 PDLR	0.26 \pm 0.07	ND	1.18 \pm 0.12	1.82 \pm 0.64	3.00	2.26 \pm 0.09	0.29 \pm 0.07	Below Release Criteria
B2S A8	A8 PDLR	ND	ND	1.24 \pm 0.12	1.71 \pm 0.29	2.94	2.64 \pm 0.63	0.17 \pm 0.08	Below Release Criteria
B2 A9	A9 PDLR	ND	ND	1.25 \pm 0.16	2.42 \pm 0.54	3.67	2.10 \pm 0.73	0.21 \pm 0.10	Below Release Criteria
B2S A10	A10 PDLR	ND	ND	1.27 \pm 0.12	1.79 \pm 0.38	3.07	3.24 \pm 0.70	0.16 \pm 0.08	Below Release Criteria
B2 A11	A11 PDLR	ND	ND	1.15 \pm 0.13	1.81 \pm 0.33	2.96	3.07 \pm 0.80	0.20 \pm 0.06	Below Release Criteria
B2 A12	A12 PDLR	ND	ND	1.17 \pm 0.13	1.83 \pm 0.53	3.00	2.60 \pm 0.86	0.22 \pm 0.10	Below Release Criteria
B2 A12-A	A12 PDLR	ND	ND	1.15 \pm 0.11	2.17 \pm 0.33	3.32	2.48 \pm 0.53	0.19 \pm 0.07	Below Release Criteria
B2 A13	A13 PDLR	ND	ND	1.23 \pm 0.14	2.07 \pm 0.48	3.30	3.16 \pm 0.92	0.23 \pm 0.09	Below Release Criteria
B2 A13-A	A13 PDLR	ND	ND	1.09 \pm 0.12	1.64 \pm 0.51	2.73	1.97 \pm 0.86	0.14 \pm 0.08	Below Release Criteria
B2SC A13-B	A13 PDLR	ND	ND	1.18 \pm 0.10	1.86 \pm 0.33	3.04	2.65 \pm 0.42	0.23 \pm 0.06	Below Release Criteria

**TABLE 1: Gamma Spectroscopy Results of Soil Samples Collected Post Drain Line Removal in the Building 2 Service Corridor
From The Period September 1999 through February 2001**

Sample ID	Beam Column Sample Location	Radionuclide Concentration (pCi/g) - Results $\pm 2\sigma$ - Background not Subtracted - 30 minute counts							Evaluation and Comments
		¹³⁷ Cs 662 keV peak	⁶⁰ Co Average of 1173/1332 keV peaks	²²⁸ Th Average of 238/583 keV peaks	²²⁸ Ra (²³² Th) Average of 338/911 keV peaks	Total Thorium ²²⁸ Th + ²³² Th	²³⁸ U 92.77 keV peak	²³⁵ U 186 (144) keV peak	
B2 SC A14	A14 PDLR	ND	ND	1.12 \pm 0.14	1.90 \pm 0.51	3.02	2.14 \pm 0.74	0.13 \pm 0.09	Below Release Criteria
B2 A15	A15 PDLR	ND	ND	1.17 \pm 0.13	1.94 \pm 0.41	3.11	3.05 \pm 0.92	0.24 \pm 0.11	Below Release Criteria
B2 A16	A15 PDLR	ND	ND	1.58 \pm 0.18	2.96 \pm 0.65	4.54	1.34 \pm 1.21	0.18 \pm 0.13	Below Release Criteria
B2A17	A17 PDLR	ND	ND	1.31 \pm 0.12	1.99 \pm 0.43	330	2.91 \pm 0.76	0.22 \pm 0.08	Below Release Criteria
B2A18	A18 PDLR	ND	ND	1.09 \pm 0.11	1.74 \pm 0.36	2.83	2.72 \pm 0.72	0.24 \pm 0.07	Below Release Criteria
B2-019	A19-PDLR	ND	ND	1.19 \pm 0.12	1.91 \pm 0.34	3.10	3.02 \pm 0.65	0.30 \pm 0.07	Below Release Criteria
B2-020	A20-PDLR	ND	ND	1.28 \pm 0.12	2.01 \pm 0.39	3.29	3.44 \pm 0.78	0.26 \pm 0.08	Below Release Criteria
B2 A20	A20 PDLR	ND	ND	1.00 \pm 0.11	1.84 \pm 0.34	2.85	1.95 \pm 0.55	0.22 \pm 0.07	Below Release Criteria
B2 A20-A	A20 PDLR	ND	ND	1.01 \pm 0.07	1.31 \pm 0.16	2.42	1.66 \pm 0.38	0.18 \pm 0.05	Below Release Criteria
B2 A21	A21 PDLR	ND	ND	1.18 \pm 0.12	2.01 \pm 0.39	3.19	2.78 \pm 0.74	0.21 \pm 0.08	Below Release Criteria
B2 A21-A	A21 PDLR	ND	ND	0.98 \pm 0.05	1.71 \pm 0.18	2.68	2.22 \pm 0.33	0.21 \pm 0.04	Below Release Criteria
B2 A22	A22 PDLR	ND	ND	1.24 \pm 0.12	2.09 \pm 0.34	3.33	3.03 \pm 0.67	0.21 \pm 0.09	Below Release Criteria
B2 A22-A	A22 PDLR	ND	ND	1.21 \pm 0.12	1.81 \pm 0.39	3.02	3.16 \pm 0.87	0.23 \pm 0.08	Below Release Criteria
B2-23	A23-PDLR	ND	ND	0.70 \pm 0.07	1.11 \pm .021	1.81	1.56 \pm 0.37	0.16 \pm 0.06	Below Release Criteria
B2 A23	A23 PDLR	ND	ND	0.94 \pm 0.11	1.39 \pm 0.30	2.33	1.96 \pm 0.64	0.14 \pm 0.11	Below Release Criteria

**TABLE 1: Gamma Spectroscopy Results of Soil Samples Collected Post Drain Line Removal in the Building 2 Service Corridor
From The Period September 1999 through February 2001**

Sample ID	Beam Column Sample Location	Radionuclide Concentration (pCi/g) - Results $\pm 2\sigma$ - Background not Subtracted - 30 minute counts							Evaluation and Comments
		¹³⁷ Cs 662 keV peak	⁶⁰ Co Average of 1173/1332 keV peaks	²²⁸ Th Average of 238/583 keV peaks	²²⁸ Ra (²³² Th) Average of 338/911 keV peaks	Total Thorium ²²⁸ Th + ²³² Th	²³⁸ U 92.77 keV peak	²³⁵ U 186 (144) keV peak	
B2-24	A24-PDLR	ND	ND	0.83 \pm 0.08	1.28 \pm 0.24	2.11	1.48 \pm 0.46	0.16 \pm 0.05	Below Release Criteria
B2-25	A25 PDLR	ND	ND	0.78 \pm 0.09	1.30 \pm 0.22	2.08	1.90 \pm 0.56	0.13 \pm 0.05	Below Release Criteria
B2 A25	A25 PDLR	ND	ND	0.76 \pm 0.11	1.32 \pm 0.36	2.07	1.26 \pm 0.65	0.16 \pm 0.10	Below Release Criteria
B2 A25-A	A25 PDLR	ND	ND	0.50 \pm 0.08	0.95 \pm 0.29	1.45	1.62 \pm 0.64	0.07 \pm 0.06	Below Release Criteria
B2-26	A26 PDLR	ND	ND	0.84 \pm 0.09	1.32 \pm 0.27	2.16	1.85 \pm 0.43	0.15 \pm 0.06	Below Release Criteria
B2 A26	A26 PDLR	ND	ND	0.98 \pm 0.12	1.80 \pm 0.38	2.77	2.16 \pm 0.71	0.22 \pm 0.09	Below Release Criteria
B2-27	27 PDLR	ND	ND	0.81 \pm 0.07	1.27 \pm 0.22	2.09	1.35 \pm 0.40	0.17 \pm 0.05	Below Release Criteria
B2-28	28 PDLR	ND	ND	1.02 \pm 0.12	1.53 \pm 0.37	2.55	1.66 \pm 0.72	0.17 \pm 0.08	Below Release Criteria
B2 B29	B29 PDLR	ND	ND	1.20 \pm 0.14	1.98 \pm 0.44	3.18	1.59 \pm 1.43	0.18 \pm 0.07	Below Release Criteria
B2 B30	B30 PDLR	ND	ND	0.94 \pm 0.12	1.84 \pm 0.45	2.79	1.89 \pm 1.41	ND	Below Release Criteria
B2 B31	B31 PDLR	ND	ND	0.85 \pm 0.13	1.69 \pm 0.43	2.54	1.66 \pm 0.76	0.14 \pm 0.09	Below Release Criteria
B2 B32	B32 PDLR	ND	ND	0.97 \pm 0.11	1.67 \pm 0.36	2.64	2.31 \pm 0.65	0.26 \pm 0.27	Below Release Criteria
B2 B32 -A	B32 PDLR	ND	ND	0.31 \pm 0.08	0.64 \pm 0.24	0.95	1.11 \pm 0.55	0.13 \pm 0.06	Below Release Criteria
B2 B32-B	B32 PDLR	ND	ND	0.49 \pm 0.17	0.59 \pm 0.14	1.09	0.53 \pm 0.49	0.05 \pm 0.06	Below Release Criteria
B2 B33	B33 PDLR	ND	ND	0.76 \pm 0.12	1.30 \pm 0.45	2.06	1.40 \pm 0.74	0.08 \pm 0.07	Below Release Criteria

**TABLE 1: Gamma Spectroscopy Results of Soil Samples Collected Post Drain Line Removal in the Building 2 Service Corridor
From The Period September 1999 through February 2001**

Sample ID	Beam Column Sample Location	Radionuclide Concentration (pCi/g) - Results $\pm 2\sigma$ - Background not Subtracted - 30 minute counts							Evaluation and Comments
		¹³⁷ Cs 662 keV peak	⁶⁰ Co Average of 1173/1332 keV peaks	²²⁸ Th Average of 238/583 keV peaks	²²⁸ Ra (²³² Th) Average of 338/911 keV peaks	Total Thorium ²²⁸ Th + ²³² Th	²³⁸ U 92.77 keV peak	²³⁵ U 186 (144) keV peak	
B2 B33-A	B33 PDLR	ND	ND	0.29 \pm 0.07	0.46 \pm 0.23	0.75	1.09 \pm 0.46	0.06 \pm 0.05	Below Release Criteria
B2 B34	B34 PDLR	ND	ND	0.58 \pm 0.09	0.77 \pm 0.29	1.35	0.84 \pm 0.48	0.10 \pm 0.06	Below Release Criteria
B2 B34-A	B34 PDLR	ND	ND	0.55 \pm 0.07	0.78 \pm 0.27	1.33	1.08 \pm 0.51	0.19 \pm 0.07	Below Release Criteria
B2 B35	B35 PDLR	ND	ND	1.07 \pm 0.28	1.80 \pm 0.83	2.87	1.82 \pm 0.70	0.28 \pm 0.11	Below Release Criteria
B2 B35-A	B35 PDLR	ND	ND	0.36 \pm 0.10	0.57 \pm 0.25	0.93	0.67 \pm 0.44	0.10 \pm 0.05	Below Release Criteria
B2 B36	B36 PDLR	ND	ND	0.49 \pm 0.09	0.86 \pm 0.39	1.35	0.89 \pm 0.71	0.07 \pm 0.06	Below Release Criteria
B2 B37	B37 PDLR	ND	ND	0.97 \pm 0.12	1.72 \pm 0.41	2.69	2.20 \pm 0.82	0.13 \pm 0.05	Below Release Criteria
B2 B38	B38 PDLR	ND	ND	0.59 \pm 0.10	1.32 \pm 0.45	1.91	ND	0.14 \pm 0.10	Below Release Criteria
B2 B39	B39 PDLR	ND	ND	0.46 \pm 0.09	0.88 \pm 0.35	1.33	0.70 \pm 0.57	0.11 \pm 0.07	Below Release Criteria
B2 B40	B40 PDLR	ND	ND	0.35 \pm 0.06	0.63 \pm 0.21	0.99	0.83 \pm 0.46	0.07 \pm 0.04	Below Release Criteria
B2 B41	B41 PDLR	ND	ND	0.48 \pm 0.10	1.10 \pm 0.41	1.58	0.99 \pm 0.60	0.12 \pm 0.07	Below Release Criteria
BS SC B42	B42 PDLR	ND	ND	0.43 \pm 0.06	2.46 \pm 0.50	2.88	2.28 \pm 0.91	0.16 \pm 0.10	Below Release Criteria
B2 SC B43	B43 PDLR	ND	ND	0.96 \pm 0.14	1.83 \pm 0.43	2.79	1.96 \pm 0.75	0.19 \pm 0.09	Below Release Criteria
B2 B44	B44 PDLR	ND	ND	1.06 \pm 0.13	1.58 \pm 0.42	2.64	1.35 \pm 1.20	0.26 \pm 0.10	Below Release Criteria
B2 B45	B45 PDLR	ND	ND	1.07 \pm 0.13	1.91 \pm 0.40	2.98	1.11 \pm 1.11	0.26 \pm 0.11	Below Release Criteria

**TABLE 1: Gamma Spectroscopy Results of Soil Samples Collected Post Drain Line Removal in the Building 2 Service Corridor
From The Period September 1999 through February 2001**

Sample ID	Beam Column Sample Location	Radionuclide Concentration (pCi/g) - Results $\pm 2\sigma$ - Background not Subtracted - 30 minute counts							Evaluation and Comments
		¹³⁷ Cs 662 keV peak	⁶⁰ Co Average of 1173/1332 keV peaks	²²⁸ Th Average of 238/583 keV peaks	²²⁸ Ra (²³² Th) Average of 338/911 keV peaks	Total Thorium ²²⁸ Th + ²³² Th	²³⁸ U 92.77 keV peak	²³⁵ U 186 (144) keV peak	
B2SC 46	B46 PDLR	ND	ND	1.03 \pm 0.07	1.86 \pm 0.23	2.89	1.89 \pm 0.04	0.16 \pm 0.15	Below Release Criteria
B2 B47	B47 PDLR	ND	ND	1.23 \pm 0.11	1.97 \pm 0.34	3.20	2.68 \pm 0.74	0.27 \pm 0.07	Below Release Criteria
B2SC 48	B48 PDLR	ND	ND	1.21 \pm 0.15	2.40 \pm 0.52	3.61	2.56 \pm 0.97	0.27 \pm 0.12	Below Release Criteria
B2 B49	B49 PDLR	ND	ND	1.45 \pm 0.16	2.18 \pm 0.57	3.63	1.20 \pm 1.1	0.25 \pm 0.11	Below Release Criteria
B2 B50	B50 PDLR	ND	ND	1.42 \pm 0.15	2.28 \pm 0.53	3.70	2.51 \pm 0.84	0.35 \pm 0.13	Below Release Criteria
BS SOIL 26	C51 PDLR	ND	ND	0.84 \pm 0.09	1.32 \pm 0.27	2.16	1.85 \pm 0.43	0.15 \pm 0.06	Below Release Criteria
B2 C52	C52 PDLR	ND	ND	1.41 \pm 0.16	2.32 \pm 0.45	3.74	1.09 \pm 1.19	0.28 \pm 0.10	Below Release Criteria
B2 C53	C53 PDLR	ND	ND	1.41 \pm 0.14	2.52 \pm 0.60	3.93	1.77 \pm 0.75	0.25 \pm 0.13	Below Release Criteria
B2 C54	C54 PDLR	ND	ND	1.36 \pm 0.19	2.43 \pm 0.61	3.79	1.44 \pm 1.33	0.38 \pm 0.13	Below Release Criteria
B2 S/C C-55	C-55 PDLR	ND	ND	1.09 \pm 0.11	1.25 \pm 0.43	1.94	1.09 \pm 0.60	0.12 \pm 0.07	Below Release Criteria
B2 C55-3	C55-3 PDLR	0.41 \pm 0.06	ND	0.91 \pm 0.09	1.25 \pm 0.26	2.17	2.23 \pm 0.53	0.35 \pm 0.34	Below Release Criteria
B2 C55-4	C55-4 PDLR	ND	ND	0.87 \pm 0.09	1.53 \pm 0.35	2.41	1.87 \pm 0.61	0.25 \pm 0.08	Below Release Criteria
B2 S/C C-56	C-56 PDLR	ND	ND	0.79 \pm 0.10	1.20 \pm 0.31	1.99	2.44 \pm 0.81	0.17 \pm 0.08	Below Release Criteria
B2 S/C C-57	C- 57 PDLR	ND	ND	0.60 \pm 0.12	1.37 \pm 0.43	1.97	1.63 \pm 0.74	0.07 \pm 0.08	Below Release Criteria
B2 S/C C-57 #1	C-57#1 PDLR	ND	ND	0.63 \pm 0.09	1.17 \pm 0.28	1.80	1.48 \pm 0.56	0.15 \pm 0.01	Below Release Criteria

**TABLE 1: Gamma Spectroscopy Results of Soil Samples Collected Post Drain Line Removal in the Building 2 Service Corridor
From The Period September 1999 through February 2001**

Sample ID	Beam Column Sample Location	Radionuclide Concentration (pCi/g) - Results $\pm 2\sigma$ - Background not Subtracted - 30 minute counts							Evaluation and Comments
		¹³⁷ Cs 662 keV peak	⁶⁰ Co Average of 1173/1332 keV peaks	²²⁸ Th Average of 238/583 keV peaks	²²⁸ Ra (²³² Th) Average of 338/911 keV peaks	Total Thorium ²²⁸ Th + ²³² Th	²³⁸ U 92.77 keV peak	²³⁵ U 186 (144) keV peak	
B2 S/C C57#2	C-57 #2 PDLR	ND	ND	0.75 \pm 0.12	1.42 \pm 0.46	2.18	1.41 \pm 0.71	0.10 \pm 0.07	Below Release Criteria
B2 S/C C57#3	C-57 #3 PDLR	ND	ND	0.70 \pm 0.08	1.01 \pm 0.32	1.70	1.27 \pm 0.62	0.14 \pm 0.07	Below Release Criteria
B2 S/C -57 #4	C-57 #4 PDLR	ND	ND	0.67 \pm 0.10	1.07 \pm 0.46	1.74	1.02 \pm 0.61	0.12 \pm 0.08	Below Release Criteria
B2 SC C-58	C58 PDLR	ND	ND	0.46 \pm 0.07	0.61 \pm 0.25	1.07	1.40 \pm 0.68	0.10 \pm 0.05	Below Release Criteria
B2 S/C C58#1	C58 #1 PDLR	ND	ND	0.89 \pm 0.12	1.72 \pm 0.42	2.61	1.56 \pm 0.86	0.17 \pm 0.10	Below Release Criteria
B2 S/C C58#2	C58 #2 PDLR	ND	ND	0.70 \pm 0.11	1.25 \pm 0.35	1.95	1.66 \pm 0.62	0.13 \pm 0.07	Below Release Criteria
B2 S/C C58#3	C58 #3 PDLR	0.14 \pm 0.06	ND	0.83 \pm 0.11	1.32 \pm 0.40	2.15	1.70 \pm 0.69	0.18 \pm 0.08	Below Release Criteria
B2 S/C C58#4	C58 #4 PDLR	0.21 \pm 0.10	ND	0.80 \pm 0.13	1.48 \pm 0.44	2.29	0.92 \pm 0.94	0.23 \pm 0.10	Below Release Criteria
B2 C59	C59 PDLR	ND	ND	0.59 \pm 0.08	0.91 \pm 0.25	1.49	0.78 \pm 0.77	0.12 \pm 0.06	Below Release Criteria
B2 C60	C60 PDLR	ND	ND	0.65 \pm 0.10	1.43 \pm 0.43	2.08	1.61 \pm 0.75	0.10 \pm 0.06	Below Release Criteria
B2 C60A	C60A PDLR	ND	ND	0.48 \pm 0.08	0.87 \pm 0.27	1.35	0.93 \pm 0.88	0.07 \pm 0.05	Below Release Criteria
B2 C61	C61 PDLR	ND	ND	0.93 \pm 0.11	1.51 \pm 0.36	2.43	1.47 \pm 0.40	0.10 \pm 0.08	Below Release Criteria
B2 C62	C62 PDLR	ND	ND	0.55 \pm 0.08	0.90 \pm 0.28	1.46	1.55 \pm 0.49	0.11 \pm 0.06	Below Release Criteria
B2 C62-A	C62 PDLR	ND	ND	0.74 \pm 0.14	1.53 \pm 0.48	2.27	1.32 \pm 0.76	0.13 \pm 0.09	Below Release Criteria
B2 C63	C63 PDLR	ND	ND	0.48 \pm 0.07	0.85 \pm 0.27	1.32	1.18 \pm 0.52	0.07 \pm 0.05	Below Release Criteria

**TABLE 1: Gamma Spectroscopy Results of Soil Samples Collected Post Drain Line Removal in the Building 2 Service Corridor
From The Period September 1999 through February 2001**

Sample ID	Beam Column Sample Location	Radionuclide Concentration (pCi/g) - Results $\pm 2\sigma$ - Background not Subtracted - 30 minute counts							Evaluation and Comments
		¹³⁷ Cs 662 keV peak	⁶⁰ Co Average of 1173/1332 keV peaks	²²⁸ Th Average of 238/583 keV peaks	²²⁸ Ra (²³² Th) Average of 338/911 keV peaks	Total Thorium ²²⁸ Th + ²³² Th	²³⁸ U 92.77 keV peak	²³⁵ U 186 (144) keV peak	
B2 C-63-A	C63 PDLR	ND	ND	0.80 \pm 0.11	1.26 \pm 0.37	2.05	2.00 \pm 0.72	0.13 \pm 0.07	Below Release Criteria
B2 C-63-B	C63 PDLR	ND	ND	0.48 \pm 0.07	0.85 \pm 0.27	1.32	1.18 \pm 0.53	0.07 \pm 0.05	Below Release Criteria
B2 C-64	C64 PDLR	ND	ND	0.55 \pm 0.06	0.92 \pm 0.11	1.47	1.48 \pm 0.52	0.08 \pm 0.05	Below Release Criteria
B2 C-65	C65 PDLR	ND	ND	0.46 \pm 0.10	1.16 \pm 0.43	1.62	1.34 \pm 1.10	0.09 \pm 0.08	Below Release Criteria
B2 C66	C66 PDLR	ND	ND	0.58 \pm 0.11	0.78 \pm 0.30	1.36	0.95 \pm 0.55	0.20 \pm 0.09	Below Release Criteria
B2 C67	C67 PDLR	ND	ND	1.04 \pm 0.13	1.95 \pm 0.48	3.00	1.71 \pm 0.75	.019 \pm 0.10	Below Release Criteria
B2 C68	C68 PDLR	ND	ND	0.56 \pm 0.07	0.99 \pm 0.33	1.55	1.62 \pm 0.53	0.11 \pm 0.06	Below Release Criteria
B2 C69	C69 PDLR	ND	ND	0.57 \pm 0.10	0.96 \pm 0.27	1.54	1.64 \pm 0.80	0.09 \pm 0.06	Below Release Criteria
B2 C70	C70 PDLR	ND	ND	0.80 \pm 0.10	1.20 \pm 0.30	2.00	1.69 \pm 0.61	0.12 \pm 0.06	Below Release Criteria
B2 C71	C71 PDLR	ND	ND	0.60 \pm 0.10	1.08 \pm 0.30	1.68	1.67 \pm 0.59	0.10 \pm 0.06	Below Release Criteria
B2 C72	C72 PDLR	ND	ND	0.65 \pm 0.12	1.06 \pm 0.45	1.71	0.88 \pm 0.74	0.08 \pm 0.06	Below Release Criteria
B2 C-73	C73 PDLR	ND	ND	0.97 \pm .011	1.70 \pm 0.33	2.67	1.99 \pm 0.62	0.19 \pm 0.07	Below Release Criteria
B2 C74	C74 PDLR	ND	ND	0.70 \pm 0.10	1.28 \pm 0.36	1.98	1.20 \pm 0.54	0.17 \pm 0.10	Below Release Criteria
B2C75	C75 PDLR	ND	ND	0.63 \pm 0.10	1.14 \pm 0.38	1.78	1.35 \pm 0.54	0.13 \pm 0.09	Below Release Criteria

NOTES

3) ND Means: ¹³⁷Cs = <0.1 pCi/g ⁶⁰Co = <0.1 pCi/g ²³⁵U = <0.2 pCi/g ²³⁸U = <3.0 pCi/g

Table 2: "Background Pit" Soil Sample Results

Sample Number	Radionuclide Concentrations (pCi/g)			
	²³⁵ U	²³⁸ U	²²⁸ Th	²³² Th
BKG PIT # 1	0.24 ± 0.11	2.45 ± 0.74	1.44 ± 0.16	2.23 ± 0.54
BKG PIT # 2	0.23 ± 0.07	2.80 ± 0.66	1.56 ± 0.14	2.10 ± 0.43
BKG PIT # 3	0.27 ± 0.11	2.73 ± 0.82	1.42 ± 0.16	2.72 ± 0.61
BKG PIT # 4	0.34 ± 0.11	2.62 ± 0.69	1.23 ± 0.13	1.77 ± 0.43
BKG PIT # 5	0.19 ± 0.11	2.56 ± 0.85	1.56 ± 0.24	2.29 ± 0.61
BKG PIT # 6	0.21 ± 0.08	2.67 ± 0.72	1.22 ± 0.10	1.85 ± 0.41
BKG PIT # 7	0.24 ± 0.10	2.56 ± 0.88	1.23 ± 0.16	2.40 ± 0.50
BKG PIT # 8	0.20 ± 0.09	2.35 ± 0.68	1.12 ± 0.11	1.73 ± 0.37
BKG PIT # 9	0.11 ± 0.09	2.02 ± 0.86	1.15 ± 0.14	1.93 ± 0.47
BKG PIT # 10	0.20 ± 0.07	2.99 ± 0.74	1.18 ± 0.13	1.78 ± 0.39
BKG PIT # 11	0.20 ± 0.11	1.77 ± 0.72	1.27 ± 0.15	1.95 ± 0.52
BKG PIT # 12	0.24 ± 0.08	2.45 ± 0.75	1.35 ± 0.12	2.07 ± 0.42
BKG PIT # 13	0.24 ± 0.11	3.32 ± 1.15	1.44 ± 0.17	2.34 ± 0.56
BKG PIT # 14	0.23 ± 0.07	3.39 ± 0.80	1.36 ± 0.15	2.29 ± 0.42
BKG PIT # 15	0.23 ± 0.12	2.60 ± 0.91	1.40 ± 0.18	2.34 ± 0.59
BKG PIT # 16	0.21 ± 0.09	3.17 ± 0.92	1.30 ± 0.12	2.29 ± 0.40
BKG PIT # 17	0.23 ± 0.10	2.46 ± 0.79	1.48 ± 0.14	2.57 ± 0.45
BKG PIT # 18	0.25 ± 0.08	2.86 ± 0.54	1.74 ± 0.19	1.91 ± 0.37
BKG PIT # 19	0.16 ± 0.10	2.39 ± 0.85	1.36 ± 0.13	1.95 ± 0.52
BKG PIT # 20	0.21 ± 0.08	3.06 ± 0.76	1.26 ± 0.13	2.15 ± 0.35
BKG PIT # 21	0.17 ± 0.09	2.14 ± 0.83	1.27 ± 0.15	2.21 ± 0.55
Average	0.21 ± 0.09	2.64 ± 0.80	1.36 ± 0.15	2.03 ± 0.47
Range	0.12 to 0.30	1.84 to 3.44	1.21 to 1.51	1.56 to 2.50

Figure 1: Main Site and Sorrento Valley Site

Building Numbers	Names
Building 1	Administration
Building 2	Science Laboratories A. B. C.
Building 7	Cafeteria
Building 9	Experimental Building
Building 10	Maintenance Building
Building 13	Technical Office Building
Building 14	Technical Office East
Building 15	Technical Office East
Building 19	Swimming Pool Building
Building 21	TRIGA Building
Building 22	TRIGA Fuel Lab Building
Building 23	Hot Cell
Building 25	Waste Yard Building
Building 27	Experimental Area
Building 27-7	Experimental Area
Building 29	Experimental Area
Building 29-2	Emergency Vehicle Storage Building
Building 30	LINAC Complex
Building 31	TRIGA Storage Building
Building 31-1	Neutron Radiography Building
Building 31-2	ECF Critical Building
Building 31-3	Storage Building
Building 33	Fusion Building
Building 33-1	Fusion Lab Building
Building 33-5	Fusion Building Annex 5
Building 34	Fusion Doublet III Building
Building 34-1	Fusion Doublet III Capacitor Building
Building 34-2	Fusion Doublet III Lab Building
Building 34-3	Fusion Doublet III Storage Building
Building 35	Test Tower Building
Building 35-1	Facilities (Shipping & Receiving) Building
Building 36	Blower Assembly Building
Building 37	Sorrento Valley Building
Building 39	Sorrento Valley Building
Building 39-1	Storage Building
Building 41	Raw Stock Facility
Building 42	NDT Facility
Building 45	Helium Circulator Test Facility
Building 63	3550 Dunhill St.
Building 64	11030 Roselle St.
Building 65	11040 Roselle St.
Building 66	3520 Dunhill St.
Building 66	3510 Dunhill St.

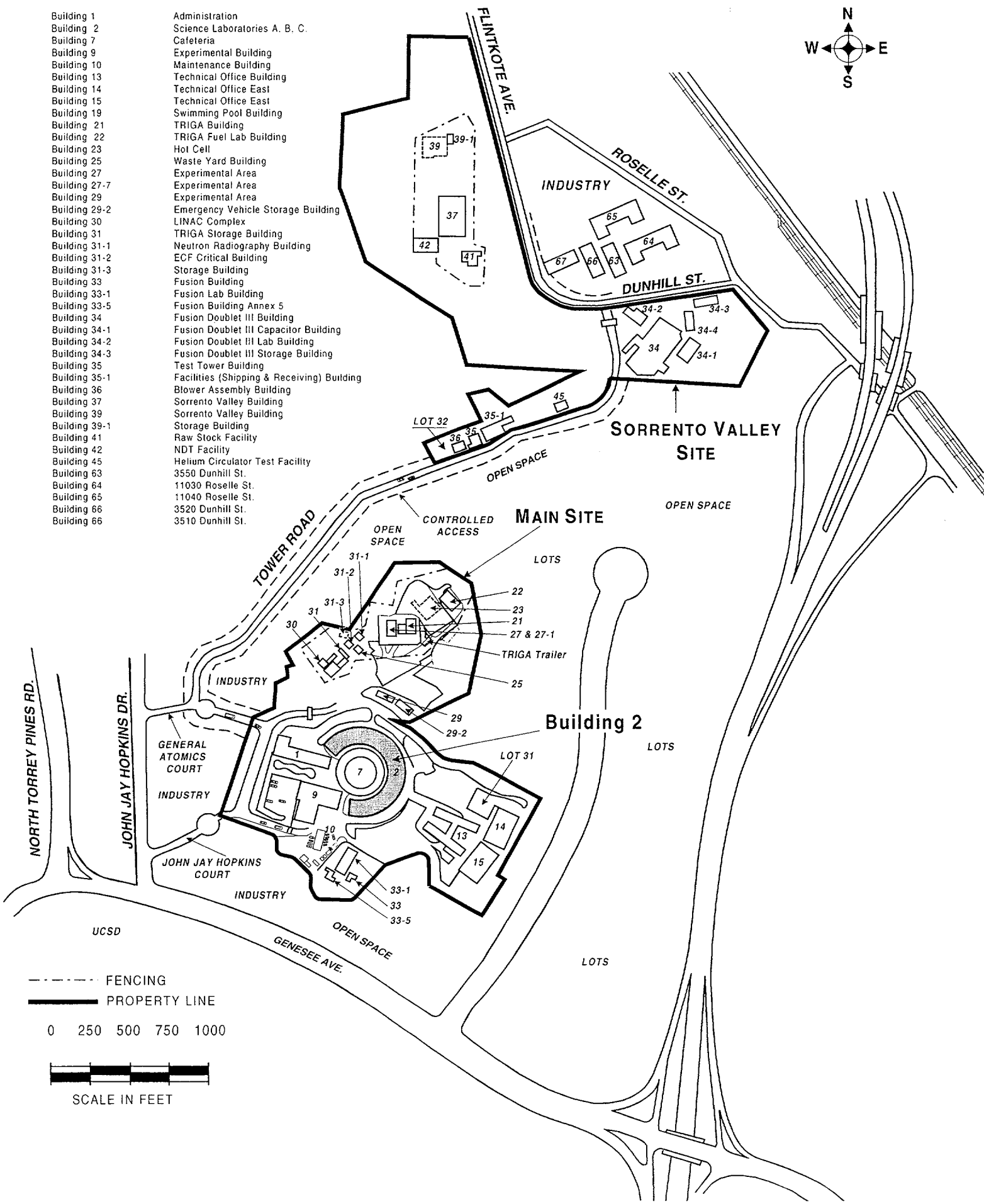


Figure 2A: Building 2 Service Corridor

03/14/2001

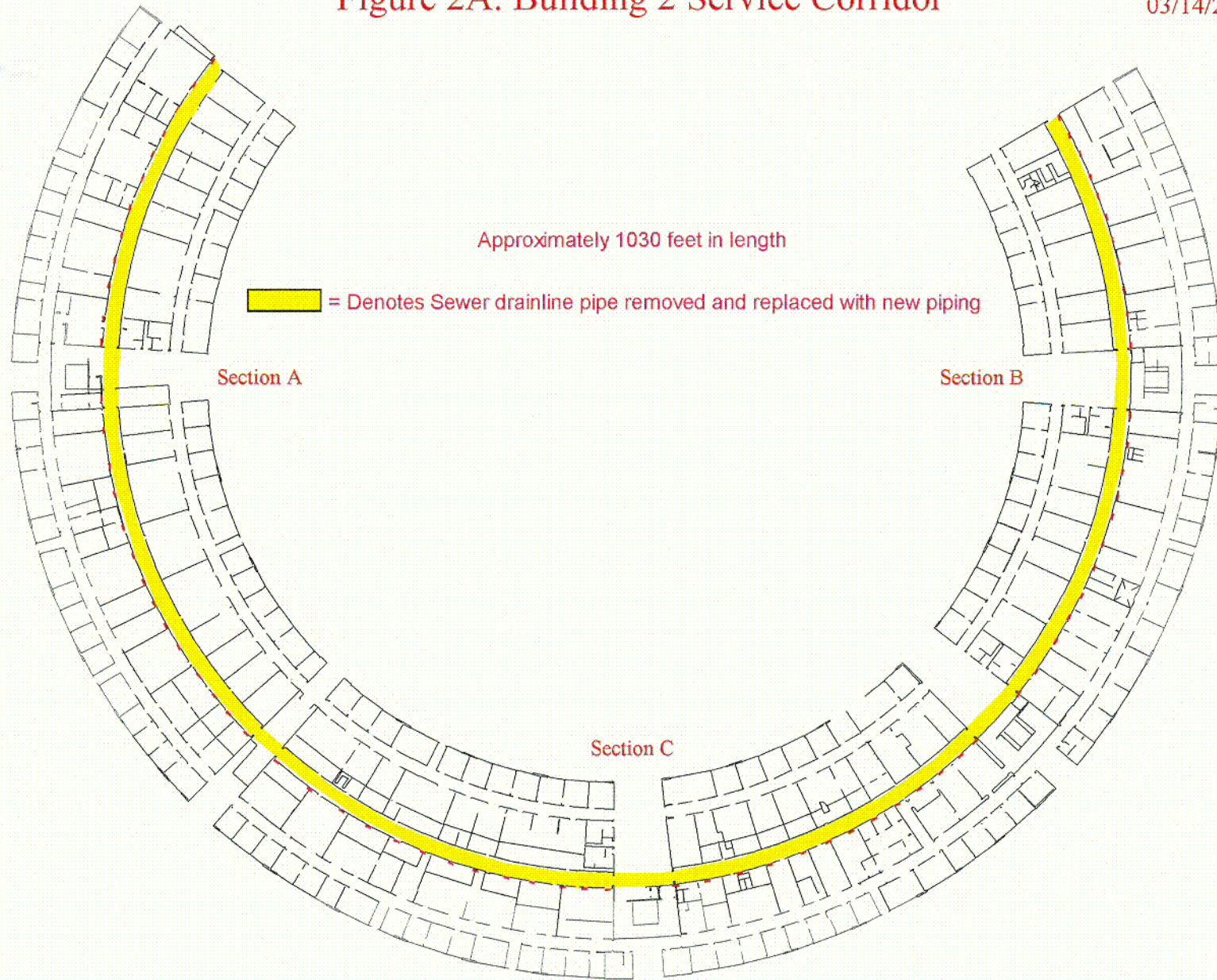


Figure 2B: Building 2 Service Corridor Drain Line
Trench Soil Sample Locations

02/11/2001

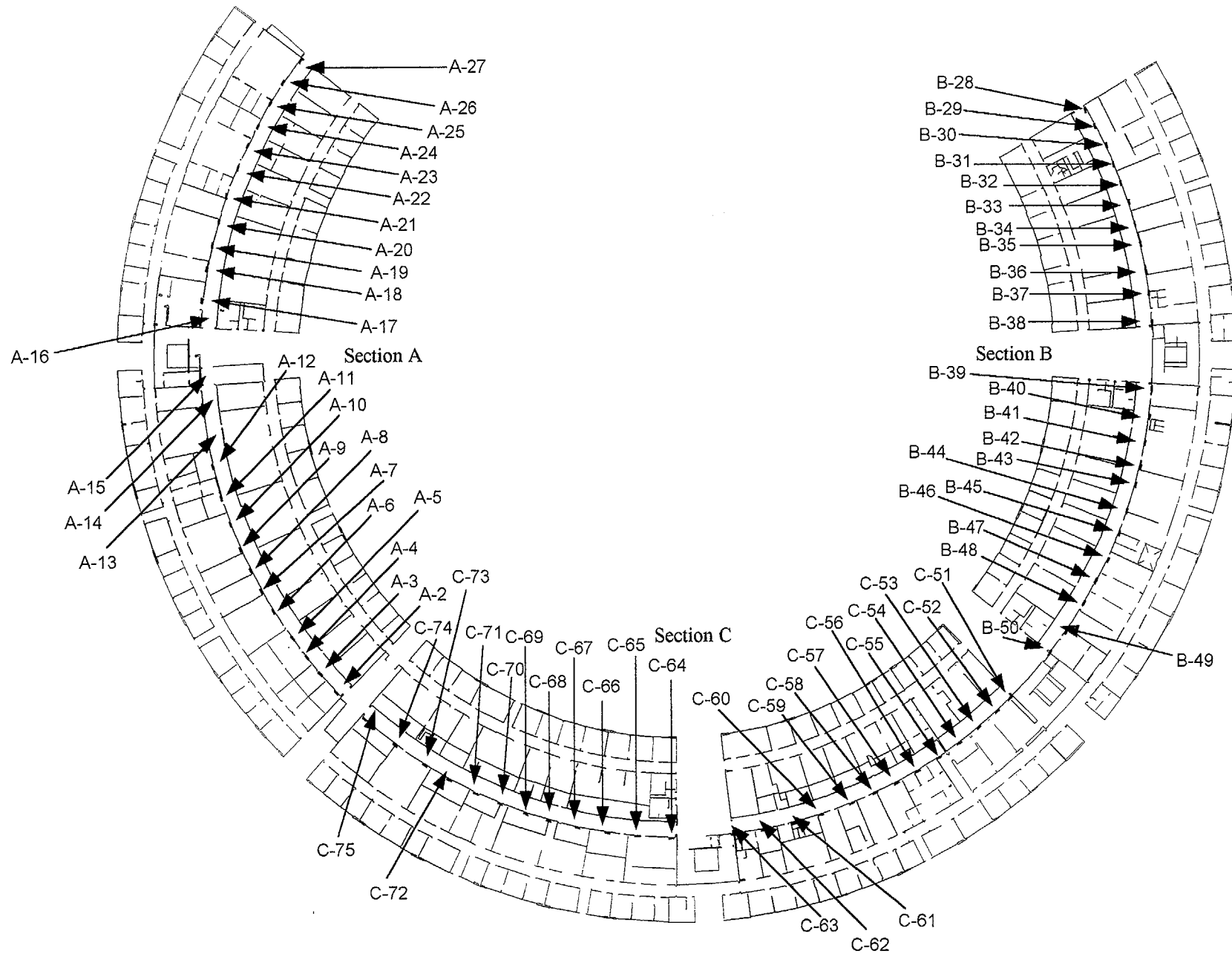
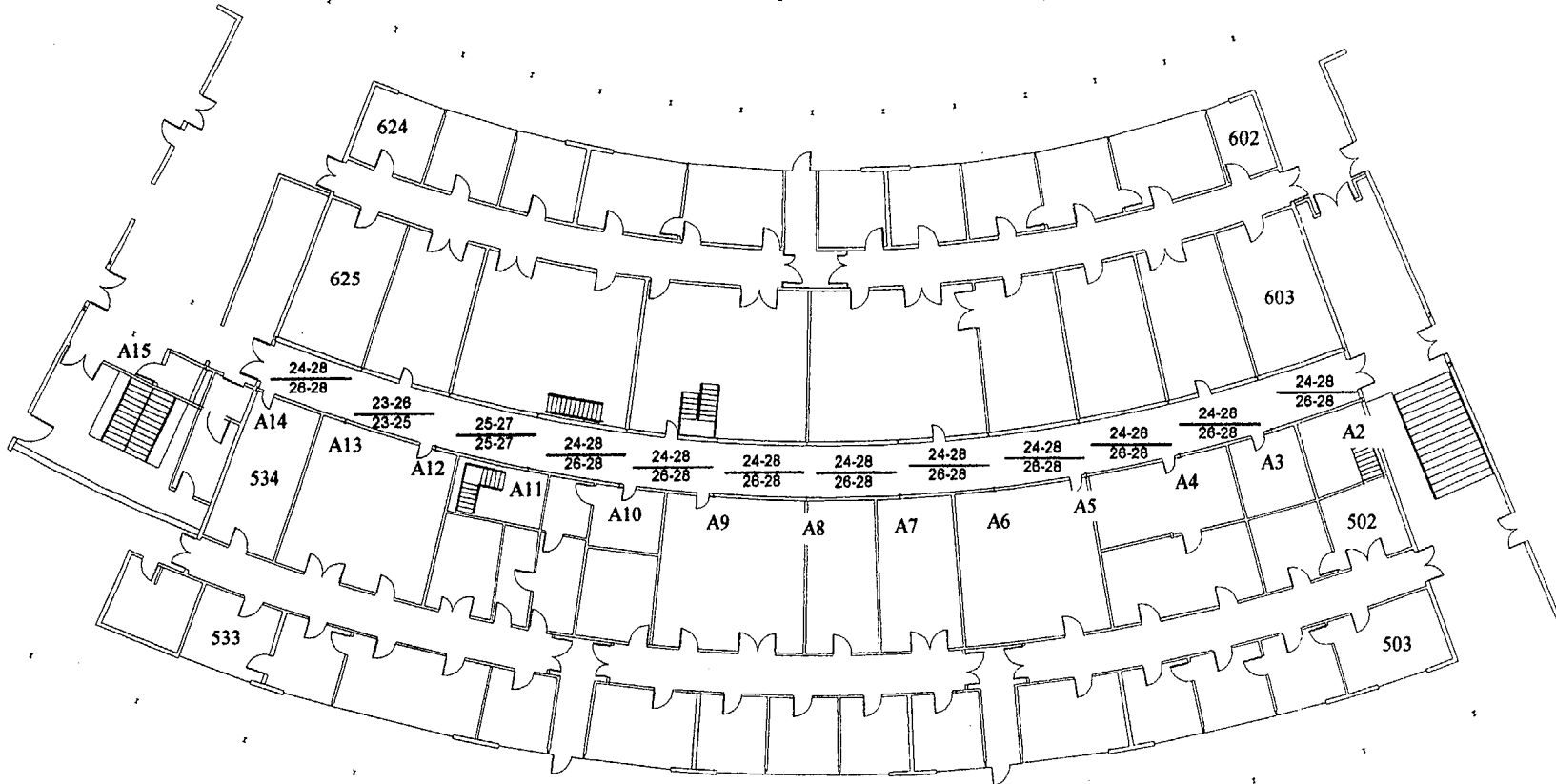


Figure 3: Building 2 Section A, Micro-R Survey, (A2 Through A15)

Trenchline Exposure Rate Survey



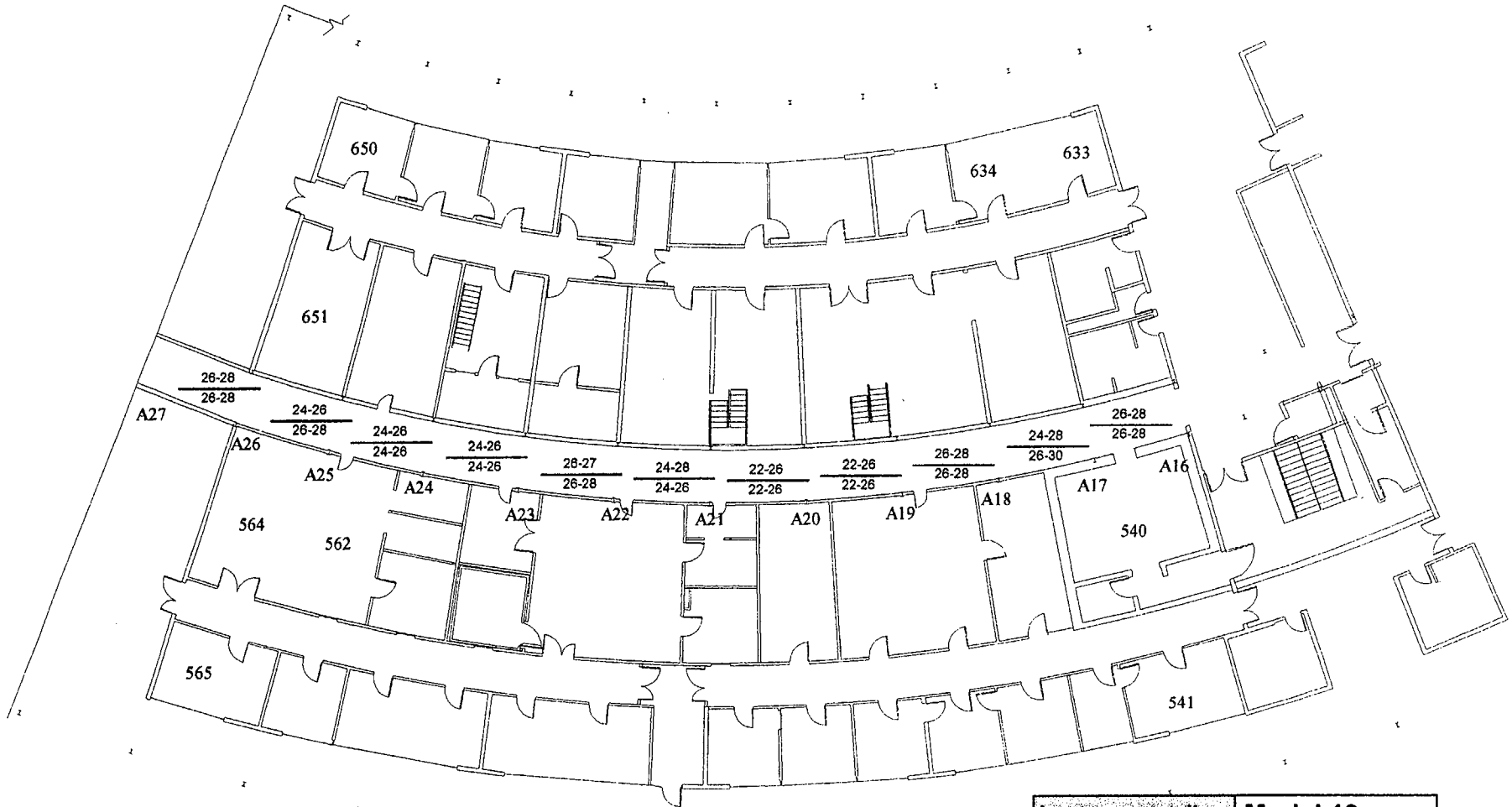
Technicians
J. Vassett
J. Sullivan
Date: 11/17/00

- # = 100 % @ bottom of trench
 # - # = 10% of sidewalls
 All readings are in $\mu\text{R/hr}$.

Instrument #	Model 19
Serial #	123930
Due	01/15/00
Size & Type	1x1 NaI(Tl) γ
Eff %	N/A
Background	20-24 (trench)

Figure 4: Building 2, Section A, Micro-R Survey, (A16 Through A27)

Trenchline Exposure Rate Survey



Technicians :

J. Vassett

J. Sullivan

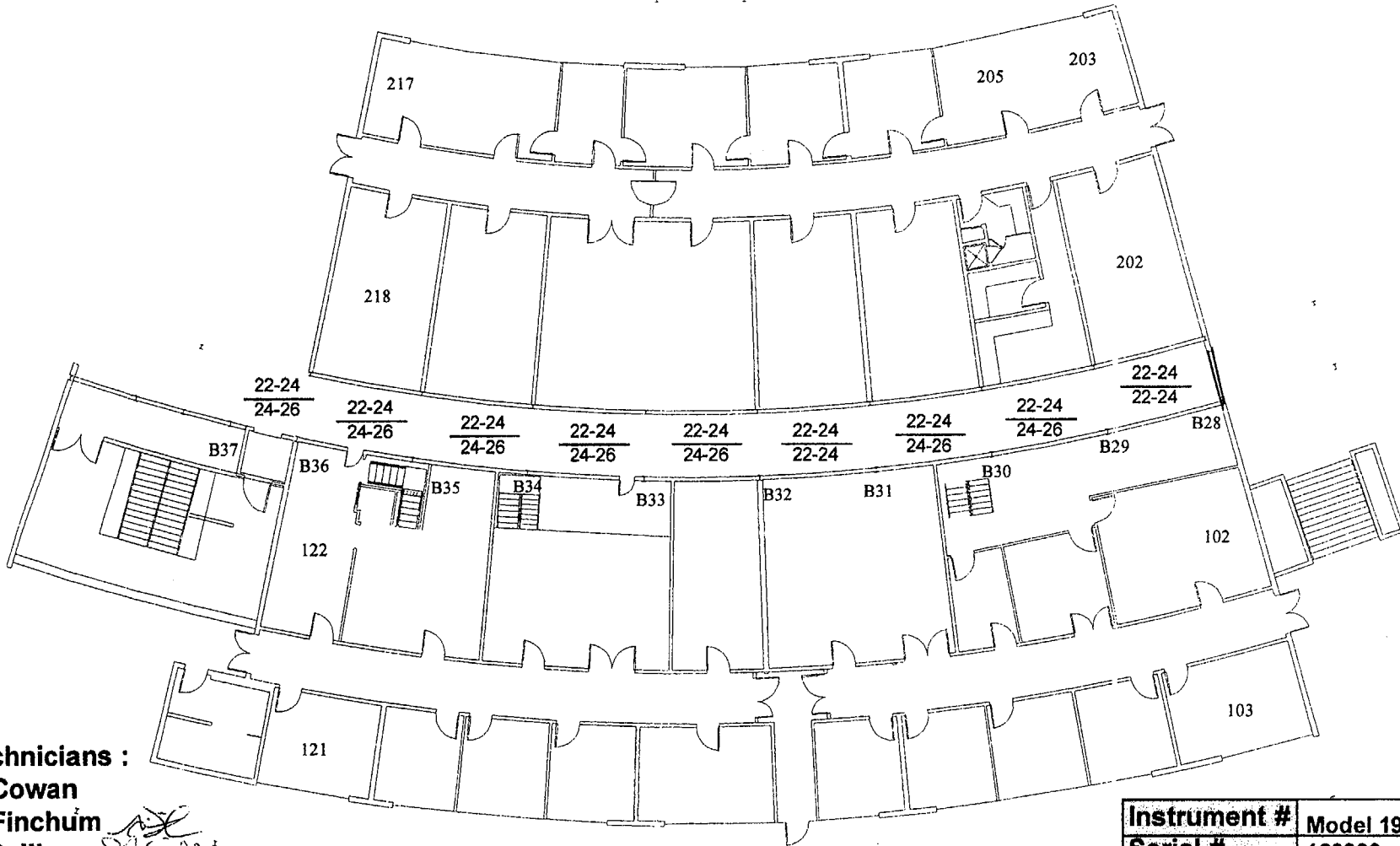
Date: 11/17/00

- # = 100 % @ bottom of trench
 # - # = 10% of sidewalls

Instrument #	Model 19
Serial #	123930
Due	01/15/00
Size & Type	1x1 NaI(Tl) γ
Eff %	N/A
Background	20-24 (trench)

Figure 5: Building 2, Section B, Micro-R Survey (B28 Through B37)

Trenchline Exposure Rate Survey



Technicians :
 S. Cowan
 S. Finchum
 J. Sullivan *[Signature]*
 Date: 10/28/00

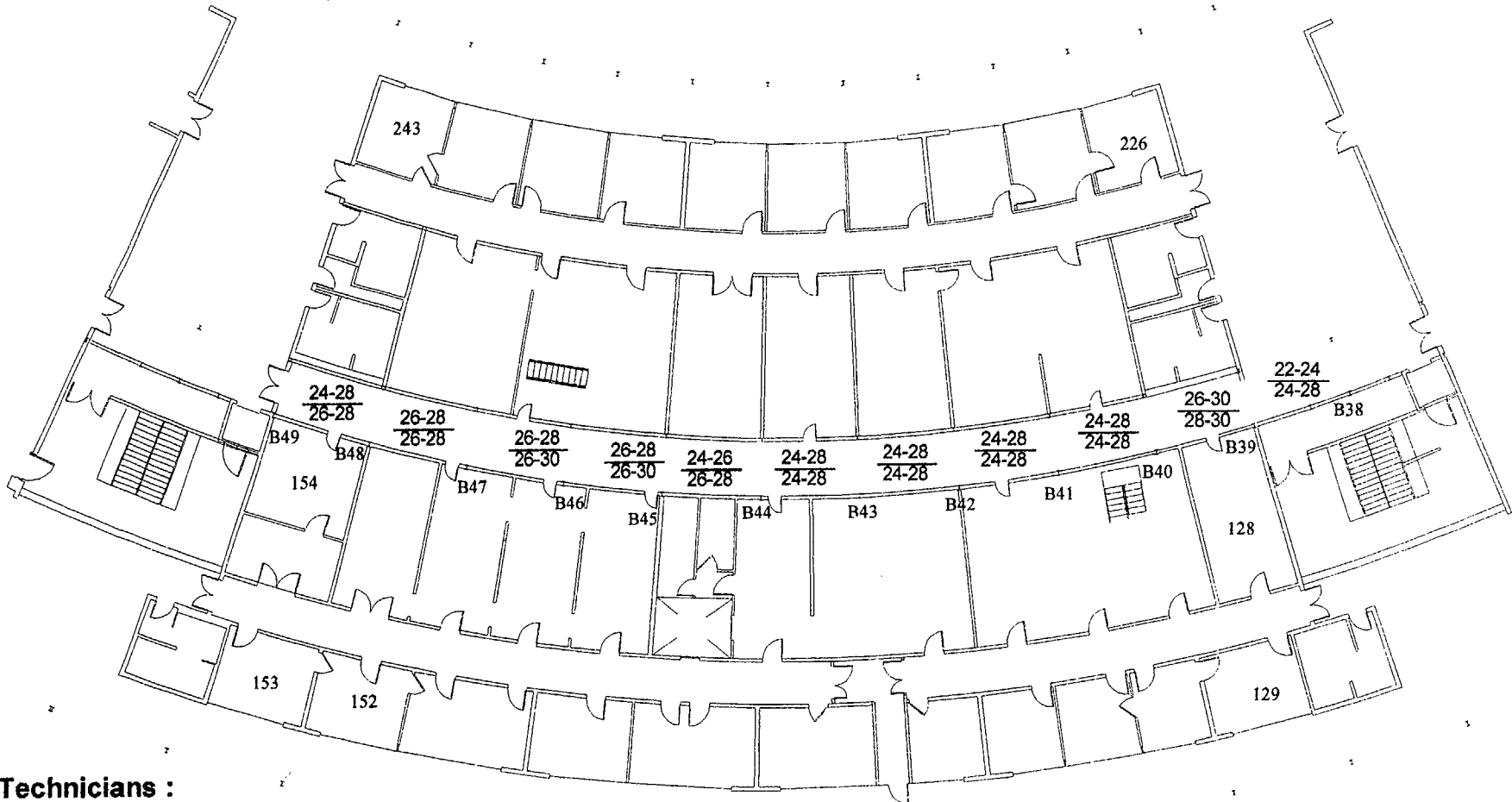
Instrument #	Model 19
Serial #	123930
Due	01/15/00
Size & Type	1x1 NaI(Tl) γ
Eff %	N/A
Background	20-24 (trench)

- # = 100 % @ bottom of trench
 # - # = 10% of sidewalls

All readings are in μ R/hr.

Figure 6: Building 2, Section B, Micro-R Survey (B38 Through B49)

Trenchline Exposure Rate Survey



Technicians :

S. Cowan

S. Finchum

J. Sullivan

Date: 10/28/00

J. Sullivan

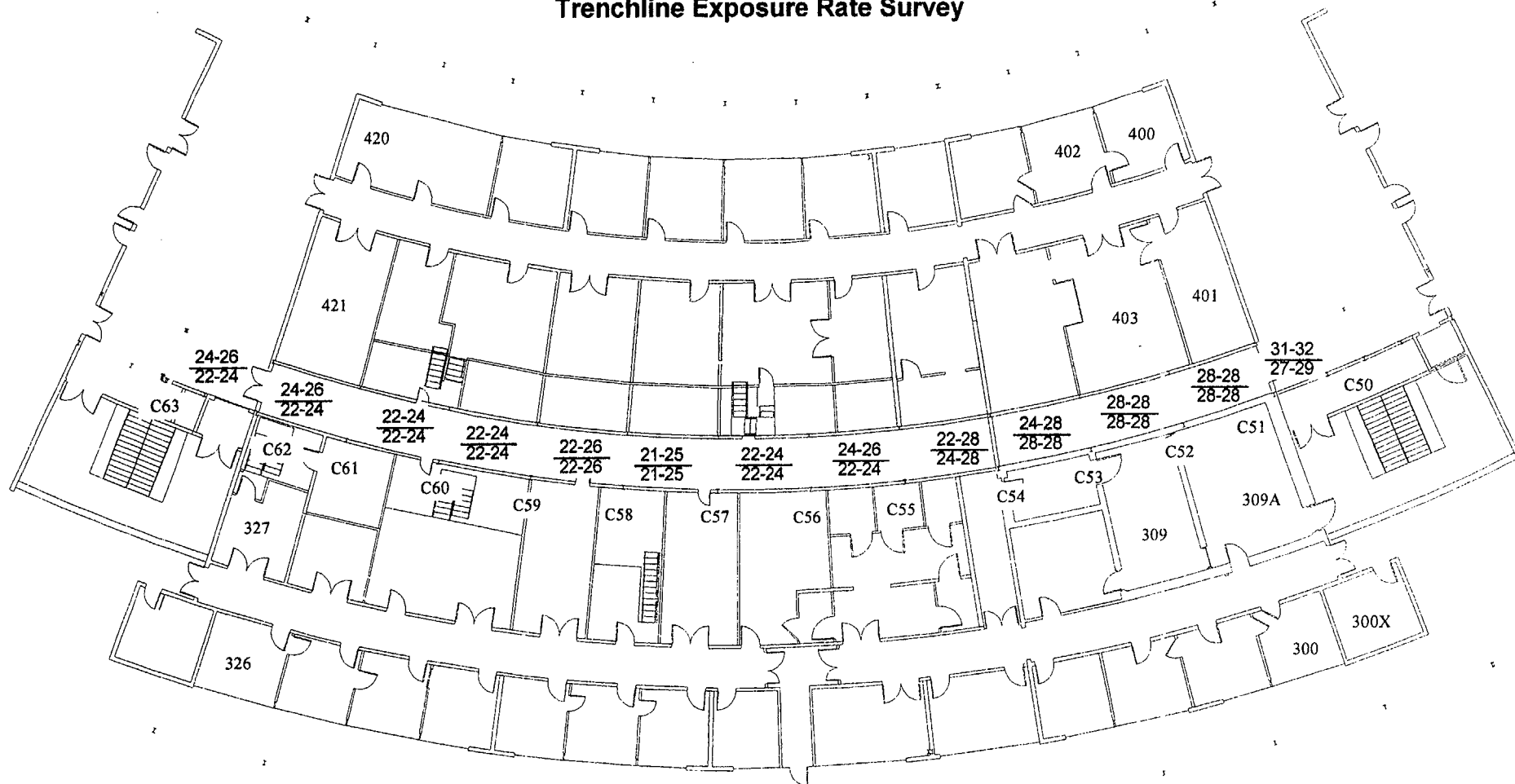
#-# = 100 % @ bottom of trench
 #-# = 10% of sidewalls

All readings are in $\mu\text{R/hr}$.

Instrument #	Model 19
Serial #	123930
Due	01/15/00
Size & Type	1x1 NaI(Tl) γ
Eff %	N/A
Background	20-24 (trench)

Figure 7: Building 2, Section C, Micro-R Survey (C50 Through C63)

Trenchline Exposure Rate Survey



Technicians :

J. Vassett

J. Sullivan

Date: 11/16/00

[Handwritten signatures of J. Vassett and J. Sullivan]

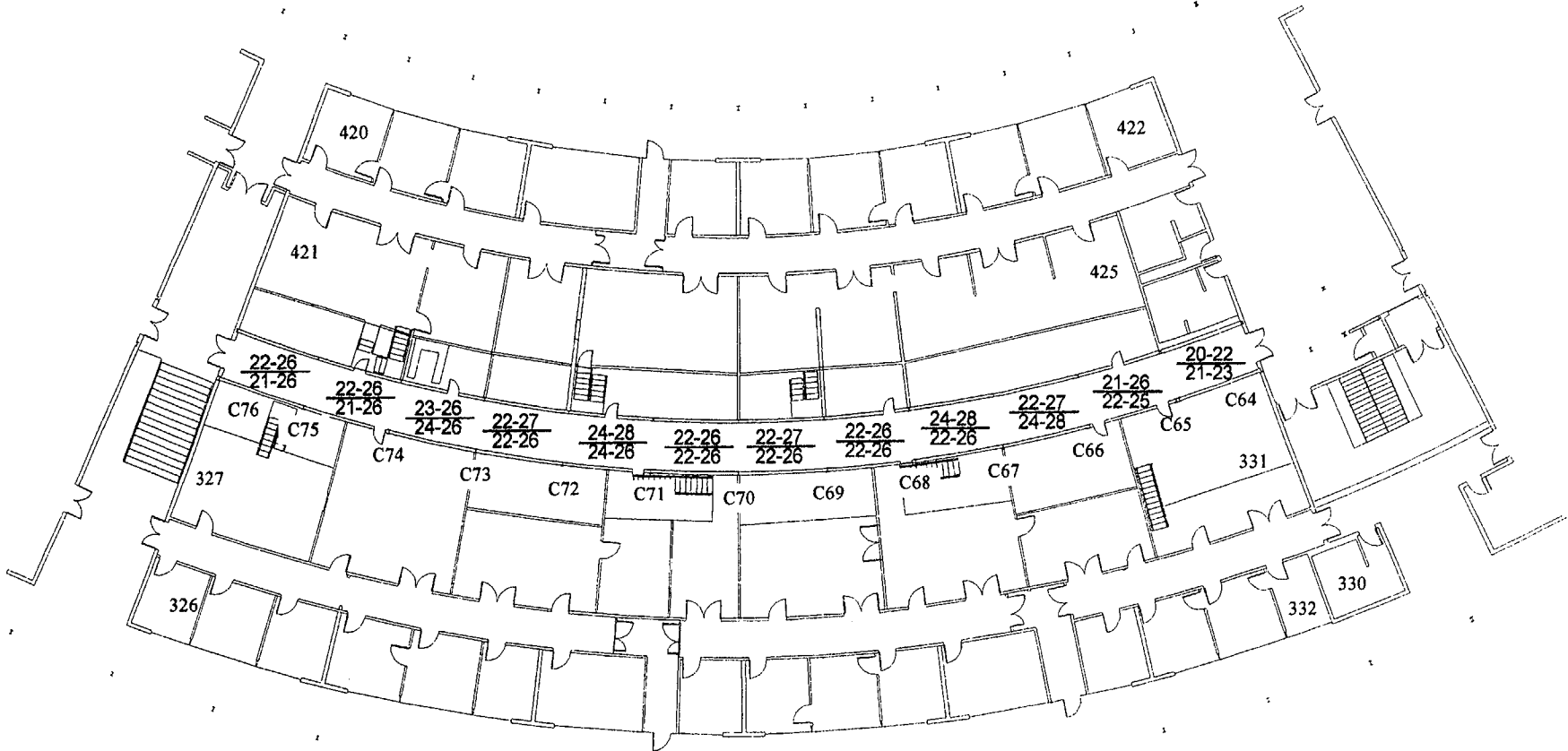
- # = 100 % @ bottom of trench

- # = 10% of sidewalls

Instrument #	Model 19
Serial #	123930
Due	01/15/00
Size & Type	1x1 NaI(Tl) γ
Eff %	N/A
Background	20-24 (trench)

All readings are in μ R/hr.

**Figure 8: Building 2 , Section C, Micro-R (C64 Through C76)
Trenchline Exposure Rate Survey**



Technicians:
J. Vassett *[Signature]*
J. Sullivan *[Signature]*
Date: 11/16/00

#-# = 100 % @ bottom of trench
 #-# = 10% of sidewalls

All readings are in $\mu\text{R/hr}$.

Instrument #	Model 19
Serial #	123930
Due	01/15/00
Size & Type	1x1 NaI(Tl) γ
Eff %	N/A
Background	20-24 (trench)

Figure 9: Torrey Pines West Land Area
(showing Background Pit Location)

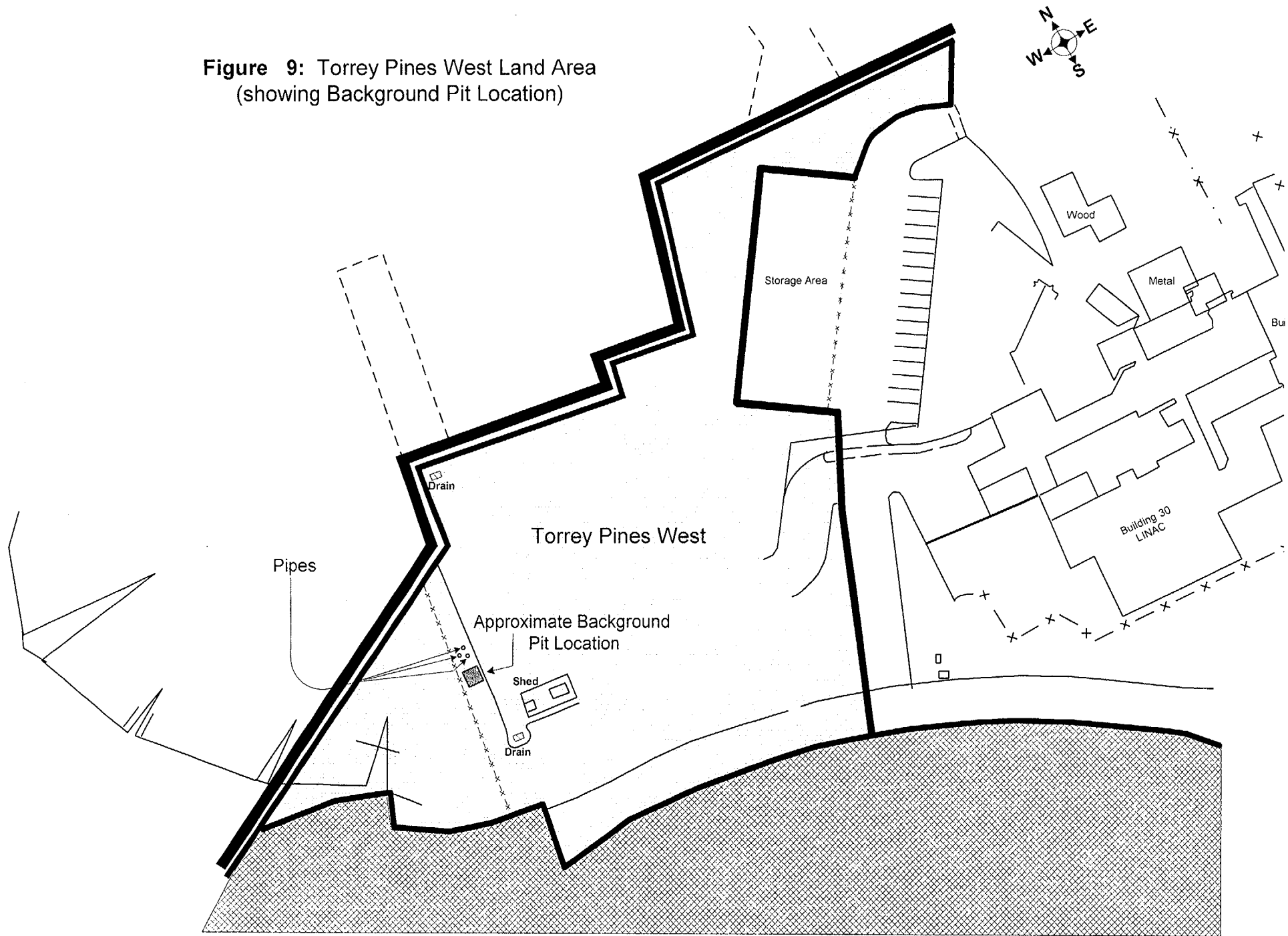
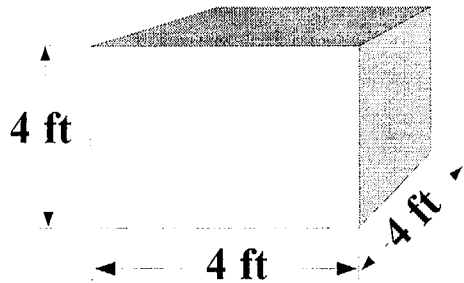
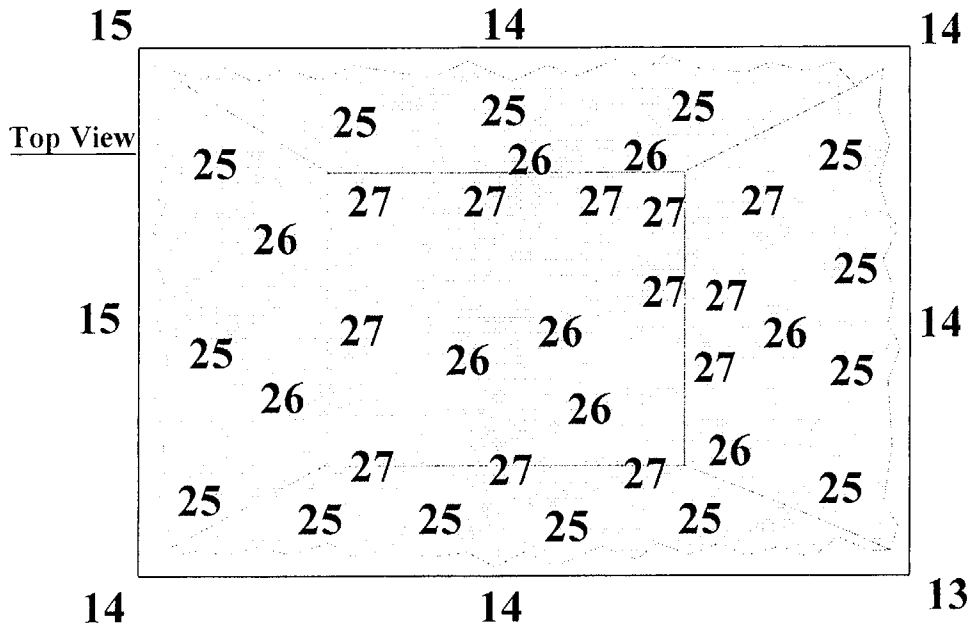


Figure 10

02/18/2000 - 02/25/2000

BACKGROUND PIT

LUDLUM MODEL 3 with 2"x 2" NaI (TI) Detector (μ R/hr)



All readings recorded in μ R/hr (on surface of soil)
 *4ft deep pit dug in clay-type soil in Torrey Pines
 West land area.

PIPE BACKGROUNDS

LUDLUM MODEL 3 with 2"x 2"
 NaI (TI) Detector (μ R/hr)

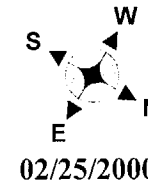
Pipe Diameter 6 inches



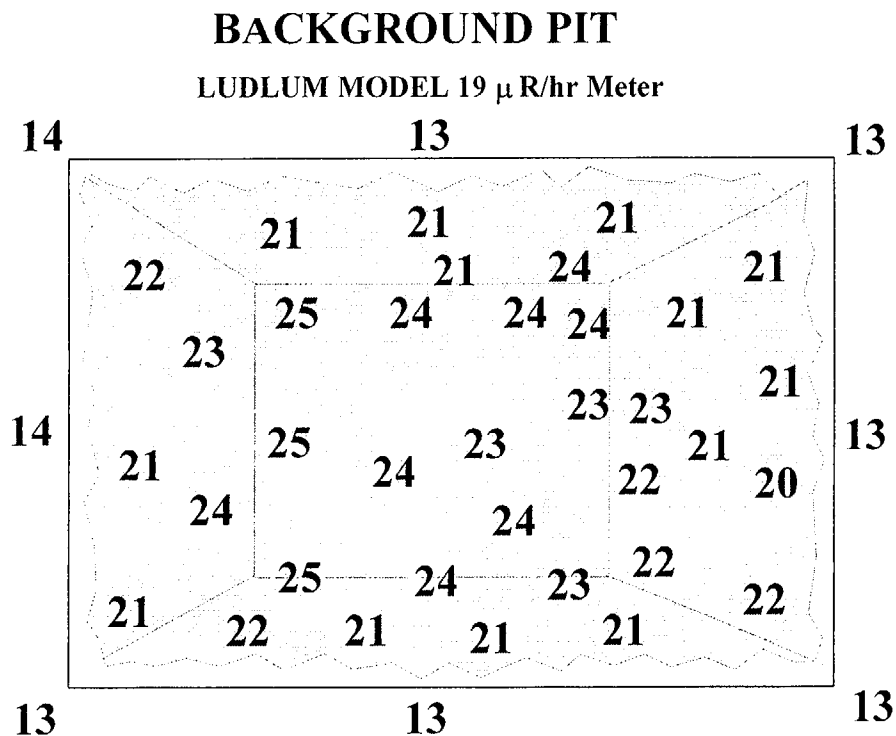
	Steel	PVC	Aluminum	
Ground	8	12	13	1'6"
	10	13	13	
1'	19	22	24	6'
2'	21	28	27	
3'	24	29	29	
4'	24	31	30	
5'	23	29	30	
6'	22	29	29	

Location	Background Pit Survey			
Instrument(s)	Model-3	N/A	N/A	N/A
Serial Number	147819	N/A	N/A	N/A
Calibration Due	08/09/2000	N/A	N/A	N/A
Efficiency	N/A	N/A	N/A	N/A
α β γ	γ	N/A	N/A	N/A
Probe Number	153765	N/A	N/A	N/A
Probe Size	44-10	N/A	N/A	N/A
Comments: All readings recorded in Micro-R per hr				
Signature: C. Stanley B. Hunter <i>[Signature]</i> Date: 02/18/2000 - 02/25/2000				

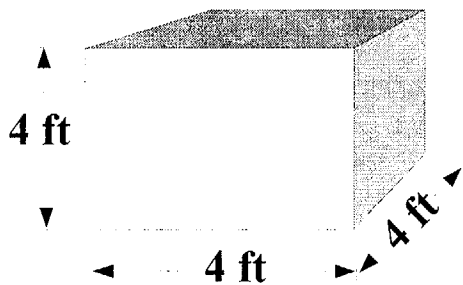
Figure 11



Top View



20 Micro-R per hour @ one meter from bottom center of pit



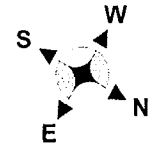
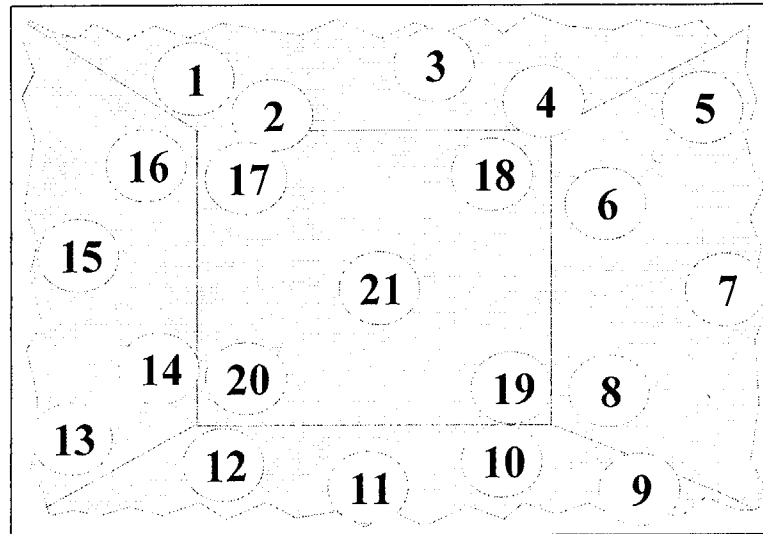
All readings recorded in μ R/hr (on surface of soil)
*4ft deep pit dug in clay-type soil in Torrey Pines
West land area.

Location	Background Pit Survey			
Instrument(s)	Model-19	N/A	N/A	N/A
Serial Number	144068	N/A	N/A	N/A
Calibration Due	04/06/2000	N/A	N/A	N/A
Efficiency	N/A	N/A	N/A	N/A
α β γ	γ	N/A	N/A	N/A
Probe Number	N/A	N/A	N/A	N/A
Probe Size	N/A	N/A	N/A	N/A
Comments: All readings recorded in Micro-R per hr				
Signature: C. Stanley <i>C. Stanley</i> Date: 02/25/2000				

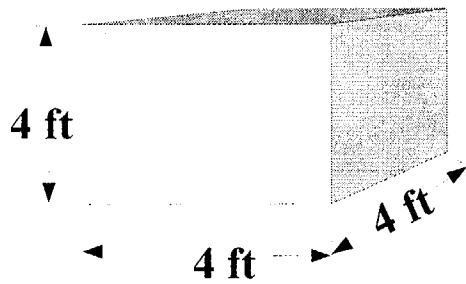
Figure 12

Top View

BACKGROUND PIT SOIL SAMPLE LOCATIONS

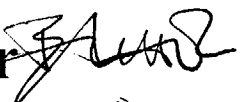


02/18/2000



n = Denotes Soil Sample Location

All soil samples begin with BP-s-n

B. Hunter 
C. Stanley 