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Global Research & Development

June 14, 2007

Ms. Patricia J. Pelke
United States Nuclear Regulatory Commission
Region III Materials Licensing Branch
2443 Warrenville Road, Suite 210
Lisle, IL 60532-4351

Subject: License Amendment Request to Remove the 46701 Commerce Center Drive Facility (Parke-Davis Plymouth Township) - License Number 21-01443-06

Dear Ms. Pelke:

This letter is to request an amendment to radioactive materials license number 21-01443-06 authorizing unrestricted release of the Parke-Davis Plymouth Township Facility. The facility is located at 46701 Commerce Center Drive, Plymouth, MI.

Licensed activities have ceased and the facility has undergone decommissioning. Decommissioning was conducted under the provisions of the Warner-Lambert, LLC radioactive materials license and in accordance with a MARSSIM-based Decommissioning Work Plan. The enclosed Final Status Report provides conclusive evidence that the facility meets the criteria for unrestricted use specified in 10 CFR 20 Subpart E. Additionally, each final status measurement indicates that residual licensed material at the facility is less than the Pfizer ALARA goal of 500 dpm/100cm^2 total activity, and 200 dpm/100cm^2 removable activity. Dose modeling indicates that the TEDE to the maximally exposed individual is < 0.001 mrem/year (0.004% of the NRC release criterion of 25 mrem/yr).

I have personally inspected the facility and verified that all licensed radioactive material and all radioactive markings have been removed from the facility. I appreciate your time and efforts with this matter and look forward to hearing back from you. If you have any questions or concerns, please contact me at 734-622-4467.

Sincerely yours,

Carol Lentz
Radiation Safety Officer

Package Shipment: RET131483

Title: PTF Decommissioning Final Status Report

Prepared by: Lentz,Carol W **Date Submitted:** Fri, 15 Jun, 2007

Header Information

Requester: Lentz,Carol W

Cost Center: 5A236 -- 148MAINLY

Requester's Address:
2800 Plymouth Road
Ann Arbor, MI 48105
United States

Building #: 200
Room #: 226
Telephone #: 734-622-4467
Extension #: 24467

This is a: Package Shipment of Documents Only

Ship To: NUCLEAR REGULATORY COMMISSION
Attention Name: Patricia Pelke
Ship To Address:
2443 Warrenville Rd. Suite 210
Lisle, IL 60532-4352
United States
Contact: Ms. Patricia Pelke -- Phone #:

Invoice #:

Intellectual Material: No
DEA Controlled Substance:

Compound (pure powder): No

Shipping Information

Destination: Domestic
Ship Via: Federal Express
Shipping Method: Standard Overnight - Afternoon
Bill Of Lading:
Saturday Delivery: No

Signature Required: Yes
Shipping Dept Pickup Required: No
Saturday Delivery: No
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Documents

Status: Submitted

Approvals

Required?	Status	Reason	Approver	Approved By	Date
Required	Ready	Shipping Functional Approver must approve all Returns.	RET eForm Shipping Approver (Ann Arbor) - Domestic-Org801	MM	6/15/07

Pfizer Global Research and Development,

Plymouth Township Facility Final Status Report

46701 Commerce Center Drive
Plymouth, MI 48170

NRC License Number:
21-01443-06

May 24, 2007

Prepared by:
Chase Environmental Group
109 Flint Road
Oak Ridge, TN 37830
865-207-3664

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TABLES

APPENDICIES

ACRONYM LIST

ALARA	As Low As Reasonably Achievable
CFR	Code of Federal Regulations
D&D	Decontamination and Decommissioning
$DCGL_{EMC}$	Derived Concentration Guideline Level – Elevated Measurement Comparison
$DCGL_{W}$	Derived Concentration Guideline Level – Wilcoxon Rank Sum
DWP	Decommissioning Work Plan
DQA	Data Quality Assessment
DQO	Data Quality Objective
DSV	Default Screening Value
FSSR	Final Status Survey Report
GSF	Gross Square Feet
HSA	Historical Site Assessment
HVAC	Heating , Ventilation, Air Conditioning
LBGR	Lower Bound of the Gray Region
MARSSIM	Multi-Agency Radiation Survey and Site Investigation Manual
MDC	Minimum Detectable Concentration
NRC	U.S. Nuclear Regulatory Commission
NIST	National Institute of Standards and Technology
PSPC	Position Sensitive Proportional Counter
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
RSC	Radiation Safety Committee
RSO	Radiation Safety Officer
TEDE	Total Effective Dose Equivalent

1.0 Executive Summary

Pfizer Global Research and Development (Pfizer) has ceased licensed activities and desires to permanently decommission the Plymouth Township Facility (PTF) located at 46701 Commerce Center Drive, Plymouth, MI 48170. The facility will be decommissioned for unrestricted use and offered for sale or lease. This will require removal of the facility from the main campus NRC Byproduct Materials License No. 21-01443-06, held by Warner-Lambert, LLC, a wholly-owned subsidiary of Pfizer, Inc.

Warner-Lambert was first authorized to use byproduct materials at the Plymouth Township Facility by Amendment No. 49 to license number 21-01443-06 on August 9, 1999. Initially, licensed activities were limited to the use of H-3 and C-14. Amendment 55, dated November 20, 2002, allowed all isotopes authorized in license number 21-01443-06 to be used at the facility. However, only H-3, C-14, P-32 and P-33 were actually used. Radiological operations using approximately 1 mCi per operation of P-32 and P-33 were generally carried out in labs 1311 and 1325. High throughput screening using up to 100 mCi of H-3 per operation were conducted in lab 1442. More recently (in the past few months), μCi quantities of C-14 were used mostly in labs 1406 and 1402. Based on an analysis of the quantities used, physical forms, half-lives, and receipt and distribution records, H-3 and C-14 are the only nuclides of concern for decommissioning. Research activities using radioactive materials ceased on May 11, 2007 and all licensed materials packaged as radioactive waste per US Department of Transportation (DOT) requirements. The exterior surfaces of each package was verified free of contamination after sealing. These waste containers were present during decommissioning activities and were moved within the waste storage room to allow access to 100% of the impacted room surfaces for decommissioning surveys. On May 23, 2007, Pfizer removed all packaged waste from the facility.

Pfizer procured Chase Environmental Group, Inc. (Chase) to perform decommissioning activities. Decommissioning was conducted under the provisions of the Pfizer radioactive materials license and in accordance with a project-specific Decommissioning Work Plan (DWP) and Quality Assurance Project Plan (QAPP). On-site decommissioning activities at the Plymouth Township site were performed from May 14 to 18, 2007.

The DWP was developed using the guidance provided in NUREG 1757, "Consolidated NMSS Decommissioning Guidance"; and NUREG 1575, "Multi-Agency Radiation Survey and Site Investigation Manual" (MARSSIM). It provided the approach, methods, and techniques for the radiological decommissioning of impacted areas of the facility. Final status surveys were designed to implement the protocols and guidance provided in MARSSIM to demonstrate compliance with the default screening values specified in NUREG 1757, Appendix B. These methods ensured technically defensible data were generated to aid in determining whether or not the facility meets the release criteria for unrestricted use specified in 10 CFR 20 Subpart E.

Pfizer established conservative ALARA goals based on the release criteria for equipment and materials specified in FC 83-23, "Guidelines for the Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Byproduct, Source, or Special Nuclear Material Licenses." Specifically, the following surface contamination limits were used for decommissioning activities:

- 5,000 dpm/100cm^2 total surface contamination (averaged over 1m^2)
- 15,000 dpm/100cm^2 maximum total surface contamination (limited to 100 cm^2)
- 1,000 dpm/100cm^2 removable surface contamination

This report presents sufficient data to support the conclusion that the facility meets the NRC release criteria. The more than one million total surface contamination measurements performed at the facility demonstrate that building structural surfaces and systems included in the scope of this report are orders of magnitude below release criteria and are suitable to release for unrestricted use. All surface contamination measurements were less than the ALARA goals and no remediation was required. Based on the Building Occupancy Scenario of NRC DandD dose modeling software Version 2.1, **the Total Effective Dose Equivalent (TEDE) to an average member of the critical group is < 0.002 mrem/year (< 0.01% of the release criterion of 25 mrem/yr)** using the results of the survey unit with the highest average activity.

2.0 Site Descriptions and History

The facility has been in use for a relatively short time such that the operational history is well known. The site was initially added to the main campus license no. 21-01443-06 on August 9, 1999 by Amendment No. 49. Due to the nature of the radiological operations conducted, only the interior portions of the facility and system exhausts need to be considered for decommissioning.

2.1 Historical Site Assessment

Chase performed a Historical Site Assessment (HSA) in March 2007. The purpose of the historical site assessment was to determine the current status of the facility including potential, likely, or known sources of radioactive contamination by gathering data from various sources. This data includes physical characteristics and location of the site as well as information found in site operating records, including radiological surveys.

The records review included: radioactive materials licenses, license applications, amendment requests, meeting minutes, radiological surveys, radionuclide receipt and distribution records, incident reports, facility renovation records, blueprints, plans and design specifications. Personnel interviews included radiation safety, maintenance, operations, and facilities personnel.

2.2 Potential Contaminants

Table 2-1 lists the radionuclides used in unsealed form at the facility. This list was compiled through review of Radiation Safety authorizations for radioactive material use

(isotope and quantity) in individual laboratories, review of radionuclide receipt and distribution records and interviews with facility personnel.

Table 2-1 Radionuclides Used in Unsealed Form

Isotope	Half-Life	DSV (dpm/100 cm^2)	DSV Basis
H-3	12.3 y	1.2E8	NUREG 1757
C-14	5730 y	3.7E6	NUREG 1757
P-32	14.3 d	9.5E6	DandD[1]
P-33	24.4 d	4.1E7	DandD[1]

After considering quantities of radionuclides used, the locations of use, and the impact of radioactive decay, the nuclides of concern are H-3 and C-14.

Sealed sources used at the site consisted of those found in analytic instruments, specifically, liquid scintillation counters. The activities of these sources are less than that required for periodic leak testing. These instruments, along with the sources, were relocated to other Pfizer licensed facilities.

2.3 License History

Licensed activities were first authorized at the Plymouth Township facility by Amendment No. 49 to license number 21-01443-06 on August 9, 1999. Activities were limited to the use of H-3 and C-14. Amendment No. 55, dated November 20, 2002, allowed all isotopes authorized in license number 21-01443-06 to be used at the Plymouth Township facility. However, only H-3, C-14, P-32 and P-33 were actually used.

Radiological operations using approximately 1 mCi per operation of P-32 and P-33 were generally carried out in labs 1311 and 1325. High throughput screening using up to 100 mCi of H-3 per operation were conducted in lab 1442. More recently (in the past few months), uCi quantities of C-14 were used mostly in labs 1406 and 1402. Radioactive samples were stored in freezers in Room 1500. Sewer disposal of licensed material was not authorized. Waste awaiting shipment was stored in a locked room (1446) designated solely for radioactive waste storage. Short term storage (up to a few hours) was also performed on the loading dock in preparation for shipments. The room is fully enclosed and locked with access only by authorized Pfizer personnel.

2.4 Operational and Closeout Radiological Surveys

During the HSA, the radiological status of the facility was determined by reviewing historical survey records and interviewing Radiation Safety personnel. Facility surfaces were maintained <200 dpm/100cm^2 removable surface contamination. The facility

[1] These values were generated using DandD v.2.1; Building Occupancy Scenario and default parameters; 0.9 quantile ≤25 mrem/year.

conducted routine periodic surveys, which were performed by researchers and Radiation Safety personnel. Laboratory closeout procedures were used when researchers completed experiments involving radioactive materials. In addition to removable contamination measurements, laboratory closeout procedures involved scan surveys using a pancake GM detector for all experiments except those using only H-3 and C-14.

In preparation for decommissioning and after vacancy of each room where radioactive materials were used, Pfizer Radiation Safety personnel performed extensive removable contamination surveys. The survey protocol consisted of collecting smears at the following locations:

- Random on floors and benches at approximately a two- meter spacing.
- 100% of sink drains.
- Four locations in 100% of fume hoods: sash, air foil, horizontal working surface and baffle.

This protocol resulted in a total of 436 removable contamination measurements. All measurements were below the license action limit of 200 dpm/100cm^2. The survey results will be maintained with other decommissioning records in the license files.

2.5 Previous Decommissioning Activities

There have not been any previous decommissioning activities performed at this site.

3.0 Current/Future Use

All licensed research activities ceased on May 11, 2007. All packaged radioactive wastes were shipped off-site on May 23, 2007. After achieving unrestricted release, the site will be offered for sale or lease.

4.0 Impacted Building Descriptions

The site is approximately a 60,000 ft^2, one-story steel frame building with concrete, glass and metal exterior walls. Interior walls are made of sheetrock or concrete block. Floors are poured concrete with various coverings. Floors in hallways and laboratory areas are covered in vinyl tile or vinyl sheet product. Office area floors are carpeted. The cafeteria, reception area and bathroom floors are covered in ceramic tile. A penthouse mechanical room houses heating, ventilation and air conditioning equipment. A building floor plan is provided as Appendix A.

The laboratory drain system consists of sink and cup sink drains located in fume hoods and casework throughout the laboratory spaces. The drains discharge directly from the building without retention or treatment. The central vacuum system consists of nozzles located throughout the laboratory spaces and a pump and accumulator located in Room 1322. Exhaust ventilation is provided primarily via the fume hood exhausts with various

room exhausts provided in the ceiling. Two exhaust fans located in the penthouse exhaust air outside via stacks.

5.0 Facility Release Criteria

Facility release criteria for unrestricted use are that of NRC 10CFR20 Subpart E. Specifically, the facility was surveyed in accordance with the guidance contained in MARSSIM to demonstrate compliance with the criteria of 10CFR20.1402 Radiological Criteria for Unrestricted Use. The criteria is that residual radioactivity results in a TEDE to an average member of the critical group that does not exceed 25 mrem per year and that the residual radioactivity has been reduced to levels that are as low as reasonably achievable (ALARA).

6.0 Derived Concentration Guideline Levels

The NRC has published default screening values in NUREG 1757 for commonly used radionuclides. The isotopes of concern screening values for surfaces under default conditions (generic screening levels) from NUREG 1757, Volume 1, Appendix B are provided in Table 6-1.

Table 6-1 Default Screening Values for Nuclides of Concern

Isotope	Half-life	Radiation Type	Default Screening Value ($dpm/100cm^2$)
H-3	12.3 years	Beta	1.2E8
C-14	5730 years	Beta	3.7E6

The default screening values (DSV) are the basis for developing the derived concentration guideline levels (DCGL's) for the project. The DCGL is the radionuclide specific surface activity concentration that could result in a dose equal to the release criterion. $DCGL_W$ is the concentration limit if the residual activity is essentially evenly distributed over a large area. For this project, $DCGL_W$ is equal to the DSV. In the case of non-uniform contamination, MARSSIM allows for evaluation of higher levels of activity over small areas using the $DCGL_{EMC}$. Due to the radiological cleanliness of the facility and Pfizer's conservative ALARA goal, small areas of elevated activity above the $DCGL_W$ are not considered. Additionally, due to Pfizer's conservative ALARA goal, application of the unity rule for multiple radionuclides is not required to demonstrate compliance with the release criteria. An important assumption of the dose model is that removable contamination is <10% of total contamination. Historical survey results as well as characterization, final status and QA survey results confirm that removable contamination levels are very low and meet this assumption. H-3 cannot be detected directly by field instrumentation due to its low energy. Therefore, H-3 contamination was evaluated by removable contamination measurements only.

7.0 ALARA Goals

Pfizer has established conservative ALARA goals based on the release criteria for equipment and materials specified in FC 83-23, "Guidelines for the Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Byproduct, Source, or Special Nuclear Material Licenses." Specifically, the following surface contamination limits were used for decommissioning activities:

- 5,000 dpm/100cm^2 total surface contamination (averaged over 1m^2)
- 15,000 dpm/100cm^2 maximum total surface contamination (limited to 100 cm^2)
- 1,000 dpm/100cm^2 removable surface contamination (operationally, this was demonstrated by ensuring each liquid scintillation counting channel was less than 200 gross cpm)

Because of the conservatism of the ALARA goals, these criteria are applied to gross beta measurements and the unity rule is not applied. The number of measurements required by MARSSIM to demonstrate compliance with the release criteria was calculated using the $DCGL_W$ and not the ALARA goal.

8.0 ALARA Analysis

Due to the extremely low doses associated with residual radioactivity at the facility, a quantitative ALARA analysis is not required. Default screening values were used to establish DCGLs. Furthermore, Pfizer routinely maintains all laboratory areas of the facility at levels less than 200 dpm/100cm^2 removable activity.

NUREG 1757, Volume 2, Appendix N states in part: "For ALARA during decommissioning, all licensees should use typical good-practice efforts such as floor and wall washing, removal of readily removable radioactivity in buildings or in soil areas, and other good housekeeping practices. In addition, licensees should provide a description in the FSSR [final status survey report] of how these practices were employed to achieve the final activity levels. In light of the conservatism in the building surface and surface soil generic screening levels developed by NRC, NRC staff presumes, absent information to the contrary, that licensees who remediate building surfaces or soil to the generic screening levels do not need to provide analyses to demonstrate that these screening levels are ALARA. In addition, if residual radioactivity cannot be detected, it may be assumed that it has been reduced to levels that are ALARA. Therefore, the licensee may not need to conduct an explicit analysis to meet the ALARA requirement."

9.0 Project Management and Organization

Due to the radiological cleanliness of the facility and the relative simplicity of the final status survey design, a complex management organization was not required. Decommissioning operations were conducted under the same Pfizer management structure as current licensed activities. Chase Environmental Group, Inc. (Chase), a licensed D&D services provider, was contracted to perform all decommissioning

activities. Chase conducted activities under the direction of the Pfizer Radiation Safety Officer. A Pfizer Project Manager was assigned to coordinate activities between Chase and Pfizer management. Additional Pfizer oversight was provided in the areas of Industrial Safety and Industrial Hygiene. Decommissioning tasks were performed according to written plans and procedures approved by Pfizer management to ensure they provided adequate worker protection and complied with the facility radioactive materials license.

The following key personnel were utilized to perform the project:

- Dave Culp was the on-site Project Manager and was responsible for all facets of planning, organizing, and managing the project. Mr. Culp has more than twenty years of experience in radiation protection and is a Registered Radiation Protection Technologist. Mr. Culp has personally managed more than 100 pharmaceutical research facility decommissioning projects.

- Duane Quayle was the on-site Radiological Engineer and was responsible for instrumentation, data management and data quality assessment. He has over 18 years of experience with instrumentation, D&D, survey planning, and stakeholder regulation both at the Oak Ridge Institute for Science and Education (ORISE) and with Shonka Research Associates (SRA). He was a key contributor in the development of NUREG-1507. Mr. Quayle has a Bachelor of Science in Radiation Health Physics and Masters of Science in Physics from the University of Massachusetts at Lowell.

- Patrick McDermott was the Project Consultant and provided independent technical review of project plans, procedures and reports. Mr. McDermott is a Certified Health Physicist with a BS in Environmental Science and an MS in Radiation Science from Rutgers University. He has over 15 years of applied health physics experience and is currently the Radiation Safety Officer for Rutgers University and the Robert Wood Johnson Medical School.

10.0 Radiation Safety and Health Program

Radiological work was performed according to the Pfizer radioactive materials license Radiation Safety Program under the management and supervision of the facility Radiation Safety Officer and Radiation Safety Committee.

11.0 Environmental Monitoring Program

Due to the simplicity of this project (survey only), an environmental monitoring program was not required.

12.0 Radioactive Waste Management

No radioactive wastes were generated as a result of project activities.

13.0 Quality Assurance Program

Chase operated under a project-specific Quality Assurance Project Plan (QAPP) utilizing the guidelines of MARSSIM Section 9. The QAPP was developed and organized with emphasis given to maximizing worker safety, minimizing/eliminating off-site releases and minimizing overall project costs.

14.0 Survey Instrumentation

14.1 Instrument Calibration

Laboratory and portable field instruments were calibrated within the previous year with National Institute of Standards and Technology (NIST) traceable sources of the nuclides of concern. Portable instrument calibration records are included as Appendix B. Liquid scintillation counter records are maintained in Pfizer license files.

14.2 Functional Checks

Functional checks were performed at least daily when in use. The background, source check, and field measurement count times for radiation detection instrumentation were specified by procedure to ensure measurements were statistically valid. Background readings were taken as part of the daily instrument check and compared with the acceptance range for instrument and site conditions.

14.3 Determination of Counting Times and Minimum Detectable Concentrations

Minimum counting times for background determinations and measurement of total and removable contamination were chosen to provide a minimum detectable concentration (MDC) that met the criteria specified in the DWP. MARSSIM equations relative to building surfaces have been modified to convert to units of dpm/100cm^2. Count times and scanning rates are determined using the following equations:

14.3.1 Static Counting

Static counting Minimum Detectable Concentration at a 95% confidence level is calculated using the following equation, which is an expansion of NUREG 1507, "Minimum Detectable Concentrations with Typical Radiation Survey Instruments for Various Contaminants and Field Conditions", Table 3.1 (Strom & Stansbury, 1992):

Equation 14-1

$$MDC_{static} = \frac{3 + 3.29\sqrt{B_r \cdot t_s \cdot (1 + \frac{t_s}{t_b})}}{t_s \cdot E_{tot} \cdot \frac{A}{100cm^2}}$$

Where:

MDC_{static} = minimum detectable concentration level in dpm/100cm^2
B_r = background count rate in counts per minute
t_b = background count time in minutes
t_s = sample count time in minutes
E_{tot} = total detector efficiency for radionuclide emission of interest (includes combination of instrument efficiency and 0.25 surface efficiency)
A = detector probe area in cm^2

A typical static MDC calculation for the Ludlum Model 43-68 gas flow proportional detector is shown below:

$$MDC_{STATIC} = \frac{3 + 3.29\sqrt{(500)(0.1)\left(1 + \frac{0.1}{1}\right)}}{(0.1)(0.12)\frac{126}{100}} = 1812 \text{ dpm/100cm}^2$$

14.3.2 Ratemeter Scanning

Scanning Minimum Detectable Concentration at a 95% confidence level is calculated using the following equation, which is a combination of MARSSIM equations 6-8, 6-9, and 6-10:

Equation 14-2

$$MDC_{scan} = \frac{d'\sqrt{b_i}\left(\frac{60}{i}\right)}{\sqrt{p} \cdot E_{tot} \cdot \frac{A}{100cm^2}}$$

Where:

MDC_{scan} = minimum detectable concentration level in dpm/100 cm^2
d' = desired performance variable (1.38)
b_i = background counts during the residence interval
i = residence interval
p = surveyor efficiency (0.5, 1 for LabRATS)
E_{tot} = total detector efficiency for radionuclide emission of interest (includes combination of instrument efficiency and 0.25 surface efficiency)
A = detector probe area in cm^2

A typical MDC_{SCAN} calculation for the SRA LabRATS gas flow proportional detector is shown below:

$$MDC_{SCAN} = \frac{1.38\sqrt{0.31}\left(\frac{60}{0.25}\right)}{\left(\sqrt{1}\right)(0.18)\left(\frac{25}{100}\right)} = 4098\,\text{dpm}/100\text{cm}^2$$

$$\text{i} = 5\,\text{cm} \cdot \frac{\text{inch}}{2.54\,\text{cm}} \cdot \frac{\text{sec}}{7.8\,\text{inch}} \cdot = 0.25\,\text{sec}$$

$$\text{b}_\text{i} = 0.25\,\text{sec} \cdot \frac{75\,\text{counts}}{\text{minute}} \cdot \frac{\text{minute}}{60\,\text{sec}} = 0.31\,\text{counts}$$

14.3.3 Smear Counting

Smear counting Minimum Detectable Concentration at a 95% confidence level is calculated using the following equation, which is NUREG 1507, "Minimum Detectable Concentrations with Typical Radiation Survey Instruments for Various Contaminants and Field Conditions", Table 3.1 (Strom & Stansbury, 1992):

Equation 14-3

$$MDC_{smear} = \frac{3 + 3.29\sqrt{B_r \cdot t_s \cdot (1 + \frac{t_s}{t_b})}}{t_s \cdot E}$$

Where:

MDC_{smear} = minimum detectable concentration level in dpm/smear
B_r = background count rate in counts per minute
t_b = background count time in minutes
t_s = sample count time in minutes
E = instrument efficiency for radionuclide emission of interest

Typical MDC calculations for H-3 and C-14 are shown below.

$$^{3}\text{H MDC}_{\text{SMEAR}} = \frac{3 + 3.29\sqrt{(12)(1)\left(1+\frac{1}{1}\right)}}{(1)(0.40)} = 48 \text{ dpm}$$

$$^{14}\text{C MDC}_{\text{SMEAR}} = \frac{3 + 3.29\sqrt{(13)(1)\left(1+\frac{1}{1}\right)}}{(1)(0.80)} = 25 \text{ dpm}$$

14.4 Instrumentation Specifications

The instrumentation used for facility decommissioning surveys is summarized in the following tables. Table 14-1 lists the standard features of each instrument such as probe size and efficiency. Table 14-2 lists the typical operational parameters such as scan rate, count time, and the associated Minimum Detectable Concentrations (MDC).

Table 14-1 Instrumentation Specifications

Detector Model	Detector Type	Detector Area	Meter Model	Window Thickness	Typical 4π Efficiency
SRA LabRATS	Position Sensitive Gas Flow Proportional	25 cm^2	N/A	0.8 mg/cm^2	18 % (C-14)
Ludlum 43-68	Gas Flow Proportional	126 cm^2	Ludlum 2221	0.8 mg/cm^2	12 % (C-14)
Beckman LS6500	Liquid Scintillation	N/A	N/A	N/A	40% (H-3) 80% (C-14)

Table 14-2 Typical Instrument Operating Parameters and Sensitivities

Measurement Type	Detector Model	Scan Rate	Count Time	Background (cpm)	MDC ($dpm/100cm^2$)
Surface Scans	SRA LabRATS	7.8 in./sec.	N/A	75 (60 sec.)	4098 (C-14)
Surface Scans	Ludlum 43-68	5 in./sec.	N/A	500 (60 sec.)	2484 (C-14)
Total Surface Activity	Ludlum 43-68	N/A	6 sec.	500 (60 sec.)	1812 (C-14)
Removable Activity	Beckman LS6500	N/A	60 sec.	12 (H-3) 13 (C-14)	48 (H-3) 25 (C-14)

14.5 Shonka Surface Contamination Monitor

A Shonka Research Associates, Inc. (SRA) Laboratory Release and Termination System (LabRATS) was used to perform characterization surface scans of building structures. The data collected were also used as final status data after passing the appropriate data quality assessment. LabRATS is a Position Sensitive Proportional Counter (PSPC). PSPCs are able to precisely identify the location of ionizing events along the length of the detector. This enables a large detector to be divided (electronically) into an array of small, "virtual" detectors. Data are recorded in 25 cm^2 pixels over the entire surface surveyed, resulting in 400 statistically significant measurements per square meter. Because the instrument does not rely on human evaluation of an audible response, and probe distance and scan speed are accurately determined, human error is nearly eliminated from the scanning process. This allows data with quality equivalent to static measurements to be collected while scanning. By logging the spatially-correlated data, the average surface contamination over each $1m^2$ area surveyed (as well as each $100cm^2$ area surveyed) can accurately be determined to demonstrate compliance with the ALARA goals for total surface contamination.

LabRATS has three modes of operation – encoder, timer and static. The encoder mode is the default mode and incorporates real-time indication and logging of scan speed. Timer mode is used to survey surfaces where geometry inhibits the proper use of a wheel encoder such as fume hood interiors. In timer mode, a default scan speed is logged with each measurement regardless of the actual scan speed. The default scan speed is set to be conservative in regards to the activity logged and the MDC of measurements. Static mode involves taking a timed count with the detector in one location. Static mode is used where scans are not feasible due to geometry and a relatively small footprint needs to be surveyed, such as the treads of stairs.

Figure 14-1 – SRA LabRATS with 100cm and 40cm Probes

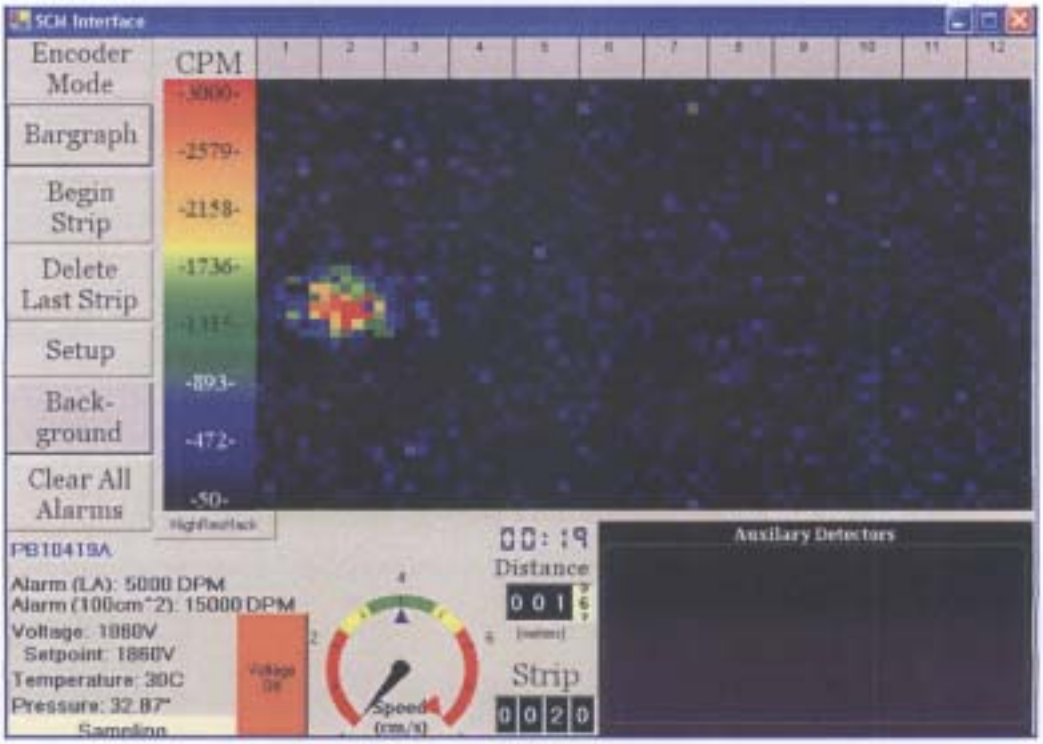


Figure 14-2 – SRA LabRATS Display

14.6 Efficiency Determination

Compliance with FC 83-23 criteria for equipment and materials is determined using a 4π instrument efficiency. MARSSIM methodology for building structures uses ISO-7503-1 methodology that takes into account the energy of the radiation and the texture of the surface as well as the 2π detector efficiency. Under MARSSIM, the default surface efficiency for beta emitters with maximum energies less than 400 KeV is conservatively set at 0.25, resulting in a total efficiency of approximately one half of the 4π efficiency. To reconcile this incongruity and to use a single data management system for all surfaces surveyed, a 4π calibration efficiency was used to determine field measurement activities for all surfaces surveyed. However, the calculated dose to demonstrate compliance with the facility release criteria for each survey unit was doubled to correct for the ISO 7503-1 surface efficiency. This methodology was chosen because:

- Application of the ISO-7503-1 surface efficiency would significantly impact final status survey time and data quality while providing no credible benefit. The impact would be in the form of slower scanning speeds, longer counting times and magnification of the variability in the natural background radioactivity present in some building materials.
- Surfaces being released are primarily sheet metal, plastic, vinyl and glass that have smooth surfaces similar to the electroplated calibration source used to determine the 4π instrument efficiency.
- The MARSSIM default surface efficiency for low energy beta emitters is conservatively based on the texture of structural surfaces usually encountered in decommissioning projects such as scabbled concrete and not on the structural surfaces usually encountered in a pristine laboratory environment.
- FC 83-23 criteria are not dose-based resulting in extreme over-conservatism for low energy beta emitters. For example, Co-60 would result in a modeled dose of 17.6 mrem/yr at the FC 83-23 criterion of 5,000 dpm/100 cm^2 (this is equivalent to ~ 2,600,000 dpm/100cm^2 C-14).

15.0 Data Quality Objectives (DQO)

The Data Quality Objective process as described in MARSSIM is used throughout the survey design and implementation. The following is a list of the major DQOs:

- Static measurements will be taken to achieve an MDC_{static} of less than the ALARA goal of 5,000 dpm/100cm^2.
- Scanning will be conducted at a rate to achieve an MDC_{scan} of less than the ALARA goal of 5,000 dpm/100cm^2.
- Removable contamination measurements will be counted to an MDC_{smear} of less than 200 gross cpm/100cm^2 in any channel.
- Individual measurements will be made to a 95% confidence interval.
- Decision error probability rates will initially be set at 0.05 for both α and β.

- The null hypothesis (H_0) and alternate null hypothesis (H_A) are that of NUREG 1505 scenario A:
  H_0 is that the survey unit does not meet the release criteria
  H_A is that the survey unit meets the release criteria
- Characterization and remedial action support surveys will be conducted under the same quality assurance criteria as final status surveys such that the data may be used as final status survey data to the maximum extent possible.

Instrument operating parameters and methodologies were established to meet the DQOs. Additionally, investigation levels were developed to verify the assumptions for classifying survey units. If these investigation levels were exceeded, an investigation was performed to verify the initial assumptions behind the classification and determine the appropriate resolution. The established investigation levels are summarized in Table 15-1.

Table 15-1 Survey Investigation Levels

Survey Unit Classification	Flag Direct Measurement or Sample Result When:	Flag Scanning Measurement Result When:	Flag Removable Measurement Result When:
All	>5,000 dpm/100cm^2	>5,000 dpm/100cm^2	> 200 gross cpm/100cm^2 in any channel

16.0 Area Classifications

Based on the results of the historical site assessment and previous survey results, facility areas were classified as impacted or non-impacted.

16.1 Non-Impacted Area

Non-impacted areas are areas without residual radioactivity from licensed activities and were not surveyed during final status surveys. The following areas are classified as non-impacted:

- Structural surfaces above a two meter height
- Building exterior surfaces
- Surface and subsurface soils of outside grounds
- Internal surfaces of positive pressurized systems

Based on historical operations, a potential exists for residual contamination from tracking on surfaces less than two meters in height. Thorough surveys of building entrances/exits and ventilation exhausts were conducted during characterization to provide adequate assurance that any residual contamination is contained within the building structure. Additionally, all building exhausts were surveyed.

16.2 Impacted Areas

Impacted areas are those areas that have potential residual radioactivity from licensed activities. Impacted areas are subdivided into Class 1, Class 2 or Class 3 areas. Class 1 areas have the greatest potential for contamination and therefore receive the highest degree of survey effort for the final status survey using a graded approach, followed by Class 2, and then by Class 3. Impacted sub-classifications are defined as follows:

16.2.1 Class 1 Area

Areas with the highest potential for contamination, and meet the following criteria: (1) impacted; (2) potential for delivering a dose above the release criterion; (3) potential for small areas of elevated activity; and (4) insufficient evidence to support classification as Class 2 or Class 3.

16.2.2 Class 2 Area

Areas that meet the following criteria: (1) impacted; (2) low potential for delivering a dose above the release criterion; and (3) little or no potential for small areas of elevated activity.

16.2.3 Class 3 Area

Areas that meet the following criteria: (1) impacted; (2) little or no potential for delivering a dose above the release criterion; and (3) little or no potential for small areas of elevated activity.

16.3 Survey Units

A survey unit is a geographical area of specified size and shape for which a separate decision is made whether or not that area meets the release criteria. A survey unit is normally a portion of a building or site that is surveyed, evaluated, and released as a single unit. For the purposes of this project, areas of similar construction and composition were grouped together as survey units and tested individually against the DCGLs and the null hypothesis to show compliance with the release criteria. Survey units were homogeneous in construction, contamination potential, and contamination distribution.

The number of discrete sampling locations needed to determine if a uniform level of residual radioactivity exists within a survey unit does not depend on the survey unit size. However, the sampling density should reflect the potential for small elevated areas of residual radioactivity. Survey units were sized according to the potential for small elevated areas of residual radioactivity. Recommended maximum survey unit sizes for building structures, based on floor area, is Class 1: up to 100 m^2 , Class 2: 100 m^2 to 1000 m^2 and Class 3: no limit.

Survey unit classifications and designations listed in the DP were determined from the HSA and are listed in tabular format in Table 16-1 and Table 16-2. Survey unit designations are represented graphically on the building floor plans presented in Appendix A.

Table 16-1 Building Structural Survey Units

Survey Unit	Rooms	Class	GSF
PF01	1311, 1325 and associated support rooms; 1500 and loading dock	2	8,533
PF02	1402, 1406 and associated support rooms	2	5,140
PF03	1438, 1442 and associated support rooms; 1522	2	7,927
PF04	Northwest office wing and lobby	3	22,501
PF05	Southeast wing Class 3 areas	3	14,243

Table 16-2 Building Systems Survey Units

Survey Unit	Description
D001	Drain System - including laboratory and fume hood sink and cup sink drains.
H001	Ventilation Exhaust System - including general ventilation exhaust ducts, fume hood exhaust ducts, fans and discharge ducts.
V001	Vacuum System - including lab nozzles, pumps, and accumulators.

17.0 Characterization Surveys

The survey protocol for building surfaces consisted of performing the scanning portion of the final status survey protocol. The minimum scan percentages are presented in Section 18.2. The survey protocol for building system surveys consisted of removable contamination measurements on internal surfaces of ventilation exhaust, house vacuum and drain systems.

18.0 Design and Performance of Final Status Surveys

Final status surveys were performed using the Data Quality Objective (DQO) process to demonstrate that residual radioactivity in each survey unit satisfied the predetermined criteria for release for unrestricted use. Final status surveys were conducted by performing the appropriate combination of scan surveys, total activity measurements and removable activity measurements as discussed further in this section. All final status surveys were performed according to survey package instructions. Survey data were documented on survey maps and/or associated data information sheets.

18.1 Background Determination

The use of reference background areas or paired background comparisons was not necessary for this project. Material and ambient background values were not significant in comparison to the DCGLs or ALARA goals. An ambient background was determined for each survey to calculate the actual survey MDCs and associated count errors. Material-specific background determinations were not performed.

18.2 Surface Scans

Scanning was used to identify locations within the survey unit that exceed the investigation level. Table 18-1 summarizes the percentage of accessible building structural surfaces to be scanned based on classification.

Table 18-1 Scan Survey Coverage by Classification

Structure	Class 2	Class 3
Floors	50%	20%
Other Structures	50%	10%

For surfaces that received less than 100% scan survey, the surfaces scanned were those with the highest potential to contain residual radioactivity at the discretion of the surveyor.

18.3 Total Surface Activity Measurements

Total surface activity (static) measurements were taken in impacted areas at each identified sample location for quality assurance. Scaler count times were determined to achieve the detection sensitivities stated in the DQOs. Field measurements were converted to an activity concentration using the following equation:

Equation 18-1

$$\text{Activity}\,(\text{dpm}/100\text{cm}^2) = \frac{cpm_{sample} - cpm_{background}}{E_{total} \cdot \frac{A}{100cm^2}}$$

18.3.1 Determining the Number of Samples

The minimum number of samples required for the Sign Test was calculated using equations in Section 5 of MARSSIM in accordance with the Decommissioning Plan. A conservative estimate of the standard deviation of total surface activity measurements (2500 dpm/100cm^2) was used. The LBGR was set at one half of the DCGL. The calculations performed to determine the required number of samples is provided below.

18.3.2 Determination of the Relative Shift

The number of required samples depends on the ratio involving the activity level to be measured relative to the variability in the concentration. The ratio to be used is called the Relative Shift, Δ/σ_S and is defined in MARSSIM as:

Equation 18-2

$$\Delta / \sigma_S = \frac{DCGL - LBGR}{\sigma_S}$$

Where:

DCGL = derived concentration guideline level
LBGR = concentration at the lower bound of the gray region. The LBGR is the average concentration to which the survey unit should be cleaned in order to have an acceptable probability of passing the test
σ_S = an estimate of the standard deviation of the residual radioactivity in the survey unit

The actual calculation is provided below:

$$\Delta / \sigma_S = \frac{3.7E6 - 1.85E6}{2500} = 740$$

Since MARRSIM Table 5.5 does not include relative shifts above 3 and the number of samples required decreases with an increasing relative shift, the relative shift was conservatively set at 3.

18.3.3 Determination of Acceptable Decision Errors

A decision error is the probability of making an error in the decision on a survey unit by failing a unit that should pass (β decision error) or passing a unit that should fail (α decision error). MARSSIM uses the terminology α and β decision errors; this is the same as the more common terminology of Type I and Type II errors, respectively. The decision errors are 0.05 for Type I errors and 0.05 for Type II errors.

18.3.4 Determination of Number of Data Points (Sign Test)

The number of direct measurements for a particular survey unit, employing the Sign Test, is determined from MARSSIM Table 5.5, which is based on the following equation (MARSSIM equation 5-2):

Equation 18-3

$$N = \frac{\left(Z_{1-\alpha} + Z_{1-\beta}\right)^2}{4\left(SignP - 0.5\right)^2}$$

Where:

N = number of samples needed in the survey unit
$Z_{1-\alpha}$ = percentile represented by the decision error α
$Z_{1-\beta}$ = percentile represented by the decision error β
SignP = estimated probability that a random measurement will be less than the DCGL when the survey unit median is actually at the LBGR
Note: SignP is determined from MARSSIM Table 5.4

MARSSIM recommends increasing the calculated number of measurements by 20% to ensure sufficient power of the statistical tests and to allow for possible data losses. MARSSIM Table 5.5 values include an increase of 20% of the calculated value. The approach for this project was to predetermine a number of samples to be applied to all survey units. This approach would provide sufficient power for the statistical test while streamlining the survey planning process. The following calculations were made to determine this number:

$$N = \frac{(1.645 + 1.645)^2}{4(0.998650 - 0.5)^2} = 11$$

$Z_{1-\alpha}$ and $Z_{1-\beta}$ are equal to 1.645 using the error rate of 0.05 from MARSSIM Table 5.2. SignP is equal to 0.998650 from MARSSIM Table 5.4. Adding an additional 20% to account for data losses resulted in a value of 14.

Therefore, the determined number of samples for the final status surveys for planning purposes was **14**.

18.3.5 Determination of Sample Locations

Determination of Class 2 survey unit sample locations is accomplished by first determining sample spacing and then systematically plotting the sample locations from a randomly generated start location. The random starting point of the grid provides an unbiased method for obtaining measurement locations to be used in the statistical tests. The use of a systematic grid allows the decision-maker to draw conclusions about the size of the potential areas of elevated activity based on the area between measurement locations.

Class 3 survey locations are determined from computer selected randomly generated x and y coordinates. Survey protocols for all areas are summarized in Table 18-2.

Table 18-2 Survey Sample Placement Overview

Survey Unit Classification		$DCGL_w$ Comparison	Elevated Measurement Comparison	Measurement Locations
Impacted	Class 2	Yes	N/A	Systematic Random
	Class 3	Yes	N/A	Random
Non-Impacted		None	None	None

In laboratory areas, permanent counter tops and other horizontal surfaces that block floor surfaces were included as a replacement to the blocked floor surface. Likewise, fixed cabinetry faces and other permanent equipment were used to replace blocked wall surfaces. Internal surfaces of permanent furnishings (i.e., drawer or cabinetry interior surfaces) are not included in the systematic measurement location placement. However, these surfaces are included in the scan surveys.

Class 2 and Class 3 survey units generally consist of many rooms. Representing each room in a "fold-out" view to show all surfaces presents a difficult and time-consuming mapping challenge. The process to identify, map and locate measurement coordinates in survey units with many rooms is complicated due to the noncontiguous nature of the survey unit once walls are "folded-out".

For the reasons above, the MARSSIM sample measurement locations (i.e., random static and wipe measurements) for Class 2 and Class 3 survey units were determined only on horizontal surfaces as determined on floor plans. This protocol increased the sample density on the surfaces with the highest probability for residual contamination (floors, benchtops, fume hood working surfaces, etc.). The appropriate percentage of all survey unit surfaces (including vertical surfaces) were scanned according to the survey unit classification.

As part of characterization, the survey technician judgmentally selected locations with the highest probability of contamination on vertical surfaces for a static measurement and smear such as light switches, door knobs, door pulls and push plates, and other locations. These measurements were in addition to and not included in the statistical analysis of the locations selected by MARSSIM protocols.

18.3.5.1 Determining Class 2 Sample Locations

In Class 2 survey units, the sampling locations were established in a unique pattern beginning with the random start location and the determined sample spacing. After determining the number of samples needed in the survey unit, sample spacing was determined from MARSSIM equation 5-8:

Equation 18-4

$$L = \sqrt{\frac{A}{N}} \text{ for a square grid}$$

Where:

L = sample spacing interval
A = the survey unit floor area
N = number of samples needed in the survey unit

Maps were generated of the survey unit's horizontal permanent surfaces included in the statistical tests. A random starting point was determined using computer-generated random numbers coinciding with the x and y coordinates of the total survey unit. A grid was plotted across the survey unit surfaces based on the random start point and the determined sample spacing. A measurement location was plotted at each intersection of the grid plot.

18.3.5.2 Determining Class 3 Sample Locations

For Class 3 areas, maps were generated of the survey unit horizontal surfaces. Sample locations were determined using computer generated random x and y coordinates for each sample location. Each location was then plotted on the applicable survey map.

18.4 Removable Contamination Measurements

Removable contamination measurements were collected by wiping an area of approximately 100 cm^2 on structural surfaces and inside building systems. For swabs or smears where less than 100cm^2 of area was wiped, area corrections were applied to correct to 100cm^2. The smears/swabs were counted to achieve the detection sensitivities stated in the DQOs. The liquid scintillation counter (LSC) was setup for dual label counting without background subtraction (gross cpm) for ^{3}H and ^{14}C. Operationally, the ALARA goal of 1,000 dpm/100cm^2 met by ensuring each LSC channel was less than 200 gross cpm.

18.5 Surveys of Building Mechanical System Internals

Surveys of various building system components were performed. Survey design for these systems is out of the scope of MARSSIM. For the purposes of identifying potential residual contamination within these systems, a survey protocol was established and is presented in the following sections.

18.5.1 Ventilation Systems

Surveys of building ventilation and fume hood ventilation systems consisted of removable contamination measurements of accessible ventilation exhaust points and at locations of potential collection or buildup. The survey protocol consisted of collecting a smear inside each fume hood exhaust duct at the fume hood and at each general exhaust duct in the ceiling. Additionally, the internal surfaces of the main exhaust fans and ducts in the penthouse were surveyed.

18.5.2 Vacuum Systems

Surveys of the house vacuum system consisted of removable contamination measurements inside 100% of lab nozzles, and inside the pump vent, pump drain and the accumulator drain.

18.5.3 Drain Systems

Surveys of building drain system internals consisted of removable contamination measurements in 100% of sink drain traps, cup sink drain traps, and floor drains.

18.6 Data Validation

Field data were reviewed by the Project Manager and validated to ensure:

- Completeness of forms
- Proper types of surveys were performed
- The MDCs for measurements met the established data quality objectives
- Independent calculations were performed on a representative sample of data sheets
- Satisfactory instrument calibrations and daily functionality checks were performed as required

Additionally, all final status survey data were entered into the Final Status Survey Database. This provided the means to sort survey data, verify activity calculations, and to compute the associated MDC and counting errors. Once data entry for a survey unit was complete, a verification report was printed and compared to original data sheets to ensure correct data entry. All data collected by LabRATS was managed by the integral SQL database.

19.0 Data Quality Assessment and Interpretation of Survey Results

The statistical guidance contained in Section 8 of MARSSIM was used to determine if areas are acceptable for unrestricted release and whether additional surveys or sample measurements were required.

19.1 Data Preparation

Due to the immense amount of data obtained and the conservative method of determining surfaces activities (the system calculates the total surface activity for each possible combination of four contiguous 25cm^2 virtual detectors comprising a 100cm^2

area), false positive results above the investigation levels are occasionally encountered. When using audible detection for scanning, false positives cause the surveyor to stop and re-scan the suspect area. Because LabRATS logs data and there is no mechanism for redacting specific acquisitions in the field (only entire strips may be redacted), an alternate approach is taken.

If an investigation level is exceeded as indicated by a LabRATS alarm, the surveyor must stop and re-scan the suspect area. If the alarm is not sustained, the surveyor may continue. If the alarm is sustained, the surveyor may then investigate the elevated area and mark its areal extent. After investigation and remediation (if necessary), the surveyor must delete the survey strip from the data set and then re-scan the entire strip to replace the redacted data. When data are processed, any data acquisitions with results exceeding the ALARA goals and known to be due to false positive indications, are redacted from the data set. Any skewing of the data set by redaction of this small amount of data is considered to be insignificant and of a lesser magnitude than retention of the known false-positive data that is redacted. The survey unit with the highest number of redactions to correct for false positives had only 32 (of more than 20,000) acquisitions redacted.

19.2 Preliminary Data Review

A preliminary data review was performed for each survey unit to identify any patterns, relationships or anomalies. Additionally, measurement data were reviewed and compared with the DCGLs and investigation levels to confirm the correct classification of survey units. All calculations of means, standard deviations, minimum and maximum values and comparisons between survey data and investigation levels are presented in the following tables. Total beta surface activity reports for each survey unit are included as Appendix D. Reports for building systems surveys are presented in Appendix E.

Table 19-1 Structural Surfaces Total Beta Surface Activity DQA

Survey Unit	Maximum (100cm^2 Area)	Maximum (1m^2 Area)	Maximum MDC	MDC Requirement Met?	ALARA Goals Met?
	(dpm/100 cm^2 total beta surface activity)				
PF01	14,190	3,345	2,585	Yes	Yes
PF02	13,826	1,708	1,918	Yes	Yes
PF03	13,333	2,056	2,545	Yes	Yes
PF04	13,870	1,098	2,223	Yes	Yes
PF05	11,532	2,441	1,944	Yes	Yes

Table 19-2 Structural Surfaces Total Beta Surface Activity Dose Calculations

Survey Unit	Mean	Median	Standard Deviation	# of Samples	# of Samples Required by MARSSIM	Adequate # of Samples?	Calculated Annual TEDE[2] (mrem/yr)
	(dpm/100 cm^2 total beta)						
PF01	-152	-515	1,693	310,681	11	Yes	-0.002
PF02	-188	-349	1,353	159,563	11	Yes	-0.003
PF03	-266	-460	1,341	320,408	11	Yes	-0.004
PF04	-127	-312	1,288	155,436	11	Yes	-0.002
PF05	133	-101	1,489	80,054	11	Yes	0.002
			Total:	**1,026,142**	**55**	**Maximum:**	**0.002**

Table 19-3 Building Systems Removable ^{3}H Summary

Survey Unit	# of Sample Locations	Mean	Standard Deviation	Min.	Max.	Investigation Level	ALARA Goal Met?
		(gross cpm/100 cm^2)					
D001	120	18	5	9	32	200	Yes
H001	253	20	8	10	95	200	Yes
V001	80	19	5	8	35	200	Yes

Table 19-4 Building Systems Removable ^{14}C Summary

Survey Unit	# of Sample Locations	Mean	Standard Deviation	Min.	Max.	Investigation Level	ALARA Goal Met?
		(gross cpm/100 cm^2)					
D001	120	11	4	2	22	200	Yes
H001	253	12	3	4	23	200	Yes
V001	80	12	3	6	21	200	Yes

The mean total surface activity results for most survey units demonstrate a slight negative bias of <15% of the applied background, indicating that the background value used for activity calculations was slightly higher than the actual background. Ironically, the survey unit with the lowest probability of residual radioactivity (PF05 that includes the northwest office wing, lobby and cafeteria) has the highest mean total surface activity. This is undoubtedly due to naturally-occurring radioactive materials in the

[2] The TEDE shown is calculated by multiplying 25 mrem/yr by the ratio of the the mean total surface activity to the C-14 DCGL of 3.7E6 dpm/100cm^2 and then multiplying by 2 to account for the ISO 7503-1 surface efficiency. See Section 14.6 for a discussion of efficiency determinations.

ceramic tile flooring in the bathrooms and cafeteria. Due to the inconsequential nature of these biases relative to the DCGL and resultant calculated doses, no reconciliation was attempted. Even if no background subtraction were applied, the resultant total surface activities would still be a very small fraction of the DCGL.

19.3 Determining Compliance for Building Surfaces and Structures

Scan surveys were completed for all survey units at the prescribed coverage with the SRA LabRATS, ensuring that the sample locations determined by MARSSIM calculations were surveyed. All final status total surface activity measurements were compared directly to the DCGL and investigation levels to determine if an area required further surveillance. All total surface activity measurement collected during final status surveys were less than the investigation levels and significantly less than the DCGL. Removable contamination surveys were not performed as part of the building structural surfaces final status protocol because:

- Laboratory closeout removable activity results provided conclusive evidence that removable contamination levels were less than 200 dpm/100 cm^2.
- The scanning sensitivity and ALARA goals were such a small fraction of the DCGL, that even if all activity measured were assumed to be removable, the dose model assumption of a 10% removable fraction was demonstrated by scan surveys.
- Removable contamination surveys were taken at the MARSSIM locations as part of Quality Assurance surveys.

Because all measurements are less than the DCGL, all survey units pass the Sign Test by definition. Therefore, the null hypothesis can be rejected and all survey units meet the release criterion and are suitable for release for unrestricted use.

19.4 Determining Compliance for Building Systems

All removable surface activity measurements were compared directly to the investigation levels to determine if an area required further examination. The geometry of building systems precluded scanning and total activity measurements. All removable activity measurements were less than the investigation level. Therefore, all systems survey units meet the release criteria and are suitable for release.

20.0 Quality Assurance Surveys

Quality assurance surveys consisted of performing static measurements with a Ludlum 43-68 gas flow proportional detector and smears at the locations determined by MARSSIM calculations. See Appendix F for floor plan maps of survey locations.

20.1 QA Survey Documentation

QA surveys were conducted under a QA survey package developed and approved by the Project Manager for each survey unit containing the following: (See Appendix G for an example survey package.)

- Survey instruction sheet
- General survey requirements
- Instrument requirements with associated MDCs, count times and scan rates
- Survey maps detailing survey locations and placement methodology
- Survey data sheets

To ensure proper data management and organization, a unique location code system was used so that survey data could be properly entered and organized in the Final Status Survey Database. A breakdown of the location code and specific code components are provided in Table 20-1.

Table 20-1 Location Code Description

A unique location code was assigned to each individual survey location to ensure proper data management of the survey results. The following format was used to ensure consistency throughout the final status survey process: **BBB-RRRR-SS-M-LLL** Where:	
BBB:	Building Code. This field represents the facility. (3 characters) PTF = Plymouth Township Facility
RRRR:	Survey Unit Number. This is the assigned survey unit number. (4 characters)
SS:	Structural Surface Code. This field represents the structural surface such as floor, wall, ceiling, etc. (2 characters) B1 = Benchtop D1 – Drain F1 = Floor H1 = Exhaust Ventilation Duct H2 = Ventilation System Component V1 = Vacuum Nozzle V2 = Vacuum System Component S1 = Other Structures
M:	Structural Material Code. This field represents the type of structural material on which a particular measurement is taken. (1 Character) B = Benchtop C = Carpet P = Painted Concrete T = Ceramic Tile V = Vinyl Tile M = Miscellaneous
LLL:	Numerical Identifier. This field represents the survey location number. The field "001" means survey point location number 1. Numerical identifiers are unique within a survey unit. (3-characters)

20.2 QA Survey Results

The conclusions reached based on QA surveys would be the same as those based on the initial surveys. QA survey results are presented in Appendix H and are summarized in the tables below.

Table 20-2 QA Survey Building Structural Surfaces Total Activity Summary

Survey Unit	# of Sample Locations	Mean	MDC	Standard Deviation	Min.	Max.	Investigation Level	Any Result Exceeding Investigation Level?
		(dpm/100 cm^2)						
PF01	14	823	1,515	1,048	-574	2,563	5,000	No
PF02	15	-334	1,639	373	-1,001	267	5,000	No
PF03	15	525	1,503	588	-267	2,336	5,000	No
PF04	14	-74	1,609	357	-694	507	5,000	No
PF05	14	898	1,406	731	-227	2,109	5,000	No

Table 20-3 QA Survey Building Structural Surfaces Removable ^{3}H Summary

Survey Unit	# of Sample Locations	Mean	Standard Deviation	Min.	Max.	Investigation Level	Any Result Exceeding Investigation Level?
		(gross cpm/100 cm^2)					
PF01	14	19	3	15	24	200	No
PF02	15	19	5	8	29	200	No
PF03	15	23	14	11	72	200	No
PF04	14	19	5	8	25	200	No
PF05	14	20	5	11	28	200	No

Table 20-4 QA Survey Building Structural Surfaces Removable ^{14}C Summary

Survey Unit	# of Sample Locations	Mean	Standard Deviation	Min.	Max.	Investigation Level	Any Result Exceeding Investigation Level?
		(gross cpm/100 cm^2)					
PF01	14	10	3	5	17	200	No
PF02	15	11	3	6	16	200	No
PF03	15	12	3	6	17	200	No
PF04	14	10	4	3	15	200	No
PF05	14	12	3	6	18	200	No

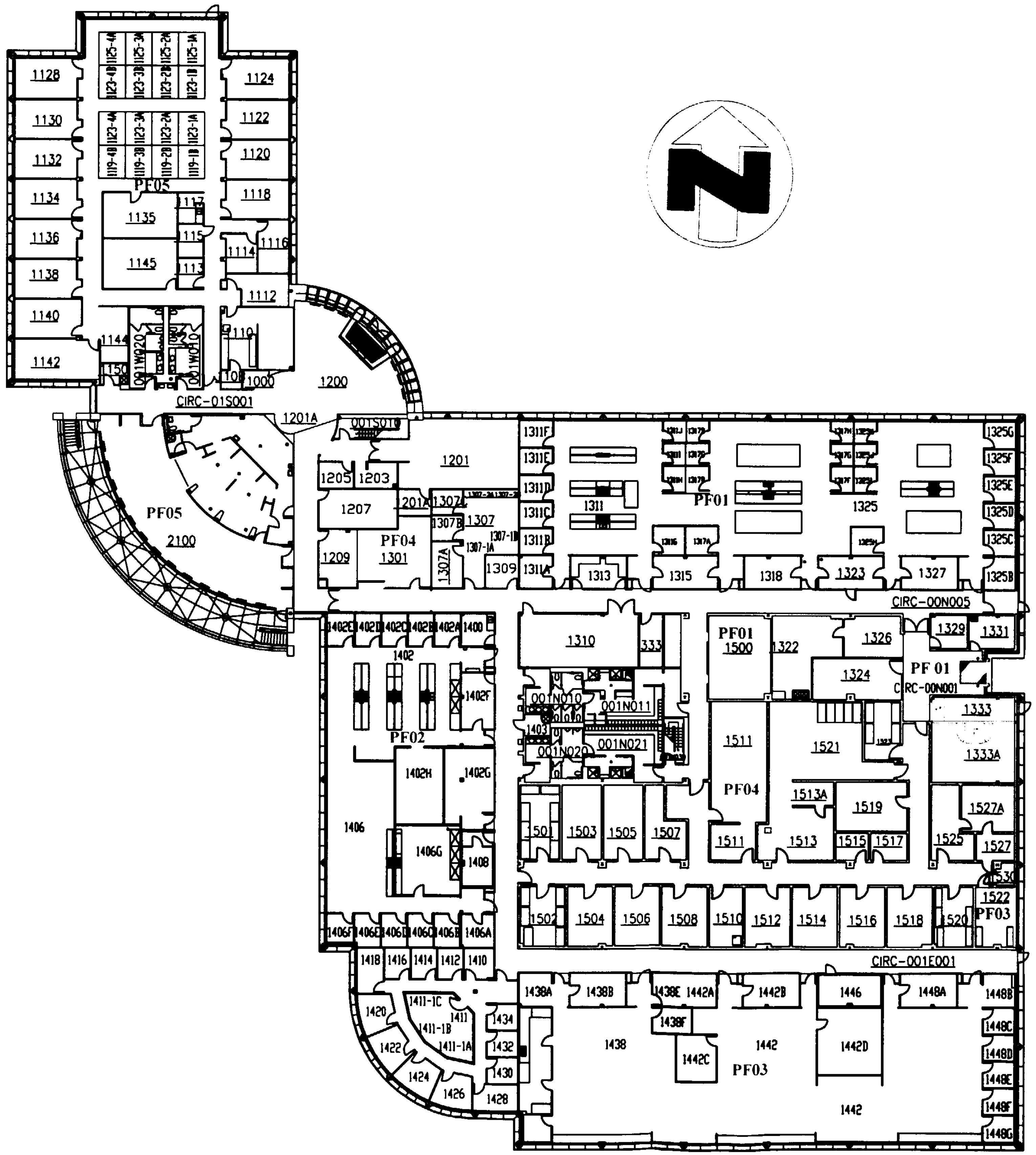
21.0 References

- NRC Regulations 10 CFR 20 Subpart E
- NUREG-1575, "Multi-Agency Radiation Survey and Site Investigation Manual" (MARSSIM)
- NUREG-1505, "A Nonparametric Statistical Methodology for the Design and Analysis of Final Decommissioning Surveys"
- NUREG 1507, "Minimum Detectable Concentrations with Typical Radiation Survey Instruments for Various Contaminants and Field Conditions"
- NUREG 1757, Volume 1 "Consolidated NMSS Decommissioning Guidance," September, 2002
- USNRC Policy and Guidance Directive FC 83-23, "Guidelines for the Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Byproduct, Source, or Special Nuclear Material Licenses."
- ISO-7503-1, "Evaluation of Surface Contamination – Part 1: Beta Emitters and Alpha Emitters." 1988
- Pfizer Plymouth Township Facility Decommissioning Work Plan
- Pfizer Plymouth Township Facility Decommissioning Quality Assurance Project Plan
- Pfizer Radioactive Materials License Number 21-01443-06

22.0 Certification

Prepared: _____ Project Manager Date: 5/24/07
Dave Culp

Approved: _____ Certified Health Physicist Date: 5/24/07
Patrick McDermott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Plymouth Township Facility
Final Status Report

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PSPC EFFICIENCY WORKSHEET – SCM MODEL IV

Equipment Configuration

PSE4 S/N:	#3	**Software Suite Version:**	1.3.1.0
Discrim. Left Min (mV):	100	**Discrim. Left Max (mV):**	12,000
Discrim. Right Min (mV):	100	**Discrim. Right Max (mV):**	12,000
Discrim. Total Min (mV):	200	**Discrim. Total Max (mV):**	24,000
Operating Voltage (V):	1975	**PSPC Type (e.g. P90):**	P100/P40
Mylar Thickness (mg/cm^2):	0.85	**Target Speed (cm/sec) or Static Constant (msec):**	10 cm/sec
Coincidence Window:	2		
Recount Method (circle):	Average / Gamma Subtraction / (NA)		

Calibration Source(s) Information

	Serial Number	Isotope	Emission Type	Half Life (years)	Assay Date	$q_{2\pi}$ Emission (particles/sec)	Active Area (cm^2)	Decay Corrected $q_{2\pi}$ Emission*
1	D7-934	C-14	Beta	5730	12/1/06	52,040	100	52,032
2								
3								
4								
5								

* To calculate the decay corrected $q_{2\pi}$ emission rate in particle/sec/100 cm^2:

$$\text{Decay Corrected } q_{2\pi} = \left[q_{2\pi} \cdot e^{\frac{-(\ln 2)t}{T_{\frac{1}{2}}}} \right] \cdot \left[\frac{100}{A} \right], \text{ where}$$

t = time, in years, between assay date and calibration date
$T_{\frac{1}{2}}$ = half life, in years
A = active area (cm^2)

NOTE: The 100/A factor is only used when the area of the calibration source is larger than the width of the PSPC.

Survey Information

	Survey Name	Number of Strips
1	2007-05 Pfizer Calibration	20
2		
3		
4		
5		

Efficiency Calculation

	Average (cpm/100 cm^2)	Instrument Efficiency (ε_i)	Surface Efficiency (ε_s)	Fraction (f)	Subtotal Efficiency (ε_t)
1	18,618	0.36	0.50	1	0.18
2					
3					
4					
5					
				Total Efficiency (ε_T):	0.18

Data Review

Data Review	Name	Date	Signature
Operator	Duane R. Quayle	5/14/2007	
Operator	N/A	N/A	N/A
Data Processor	Duane R. Quayle	5/14/2007	
Project Manager	DANE CWP	5-14-07	

Isotope Products Laboratories
An Eckert & Ziegler Company

24937 Avenue Tibbitts
Valencia, California 91355

Tel 661·309·1010
Fax 661·257·8303

CERTIFICATE OF CALIBRATION
BETA STANDARD SOURCE

Radionuclide:	C-14	**Customer:**	SHONKA RESEARCH ASSOCIATES
Half-life:	5730 ± 40 years	**P.O. No.:**	1727
Catalog No.:	LDS-014-100MM	**Reference Date:**	1-Dec-06 12:00 PST
Source No.:	D7-934	**Contained Radioactivity:**	109.3 nCi 4044 Bq

Physical Description:

A. Capsule type:	LDS (121 mm x 121 mm)
B. Nature of active deposit:	Distributed and evaporated carbon compound on polymeric membrane
C. Active area:	100 mm x 100 mm
D. Backing:	Acrylic
E. Cover:	0.9 mg/cm² aluminized mylar

Radioimpurities:

None detected

Method of Calibration:

This source was prepared from a weighed aliquot of solution whose activity in µCi/g was determined using a liquid scintillation counter.

Uncertainty of Measurement:

A. Type A (random) uncertainty:	± 2.0 %
B. Type B (systematic) uncertainty:	± 3.0 %
C. Uncertainty in aliquot weighing:	± 0.6 %
D. Total uncertainty at the 99% confidence level:	± 3.7 %

Notes:

- See reverse side for leak test(s) performed on this source.
- IPL participates in a NIST measurement assurance program to establish and maintain implicit traceability for a number of nuclides, based on the blind assay (and later NIST certification) of Standard Reference Materials (as in NRC Regulatory Guide 4.15).
- Nuclear data was taken from NCRP Report No. 58, 1985.
- This source has a working life of 2 years.
- This source had a surface emission rate of 52040 β/min in 2π on 23 Oct 06.

Daniel James Van Dalsem
Quality Control

23-OCT-06
Date

IPL Ref. No. 1116-74

THE LEAK TEST(S) INDICATED BY THE CHECKED BOX(ES) WAS(WERE) APPLIED TO DETERMINE THE INTEGRITY OF THE SOURCE(S) DESCRIBED ON THE FRONT SIDE. THE LEAK TEST(S) INDICATED BELOW WERE EITHER TAKEN DIRECTLY FROM ISO 9978:1992 OR DERIVED FROM THE LEAK TEST METHODS LISTED IN ISO 9978:1992 WHEN AN APPROPRIATE TEST WAS NOT SPECIFICALLY LISTED.

☐ ***Standard Wipe Test***

The source was wiped over its entire surface with a moistened filter paper disk. After drying, the disk was checked for activity using a scintillation detector. There was <0.001 μCi beta-gamma and <0.0001 μCi alpha of removable activity.

☒ ***Special Wipe Test***

The source was wiped over its entire surface with moistened polystyrene. The polystyrene was then dissolved in a liquid scintillation cocktail and counted in a liquid scintillation counter. There was <0.001 μCi beta-gamma and <0.0001 μCi alpha of removable activity.

☐ ***Distilled Water Soak Test***

The source was immersed in distilled water and maintained at 50°C ± 5°C for a minimum of four hours or room temperature (20°C ± 5°C) for 24 hours. After removal of the source, the liquid was **a)** checked for activity using a liquid scintillation counter, or **b)** evaporated in a planchet and the residue checked for activity using a windowless proportional counter or end-window G.M. tube. There was <0.001 μCi beta-gamma and <0.0001 μCi alpha of removable activity.

☐ ***Liquid Scintillation Soak Test***

The source was immersed for a minimum of 3 hours at room temperature in a liquid scintillation cocktail, which does not attack the source's outer surface material. The source was stored away from light to avoid photoluminescence. The sealed source was then removed and the activity of the liquid scintillation cocktail was measured. There was <0.001 μCi beta-gamma and <0.0001 μCi alpha of removable activity

☐ ***Gas Source Test***

The source was placed in a vacuum desiccator and maintained at a pressure of <10 mm Hg for not less than 12 hours. The activity was checked by introducing air into the desiccator and monitoring the air with an end-window G.M. tube. There was <0.001 μCi beta-gamma of removable activity

☐ ***Ampoule Leak Test***

The ampoule was kept in an inverted position on a filter paper disk or polystyrene wipe for a minimum of 16 hours. The wipe was then checked for activity using a scintillation detector or liquid scintillation counter. There was <0.001 μCi beta-gamma and <0.0001 μCi alpha of removable activity.

☐ ***Bubble Leak Test***

The container was pressurized to its fill pressure; then soapy water was applied over its valve and neck or, the valve and neck of the vessel were immersed in water. If no growing bubbles were observed, the container was considered leak free.

☐ ***Wipe Test for Industrial Ni-63 Sources***

The sources were wipe tested by an approved sampling plan, which called for either 100% of the batch to be individually wipe tested, or, a subset thereof. The wipe test(s) used to test for removable contamination and the results of those tests are recorded on the front of this form.

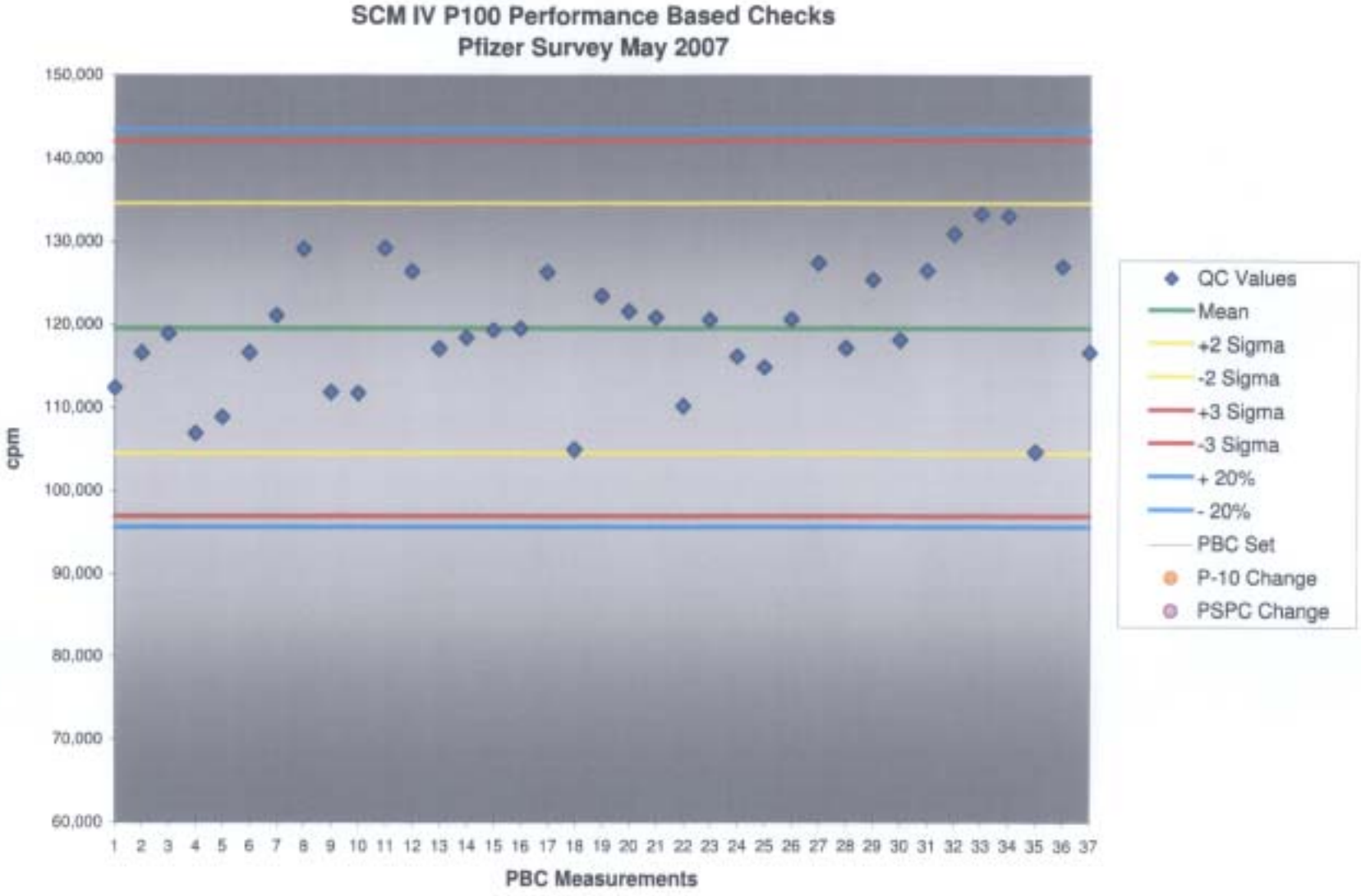
☐ ***Pressure Test for Triotech Kr-85 Sources***

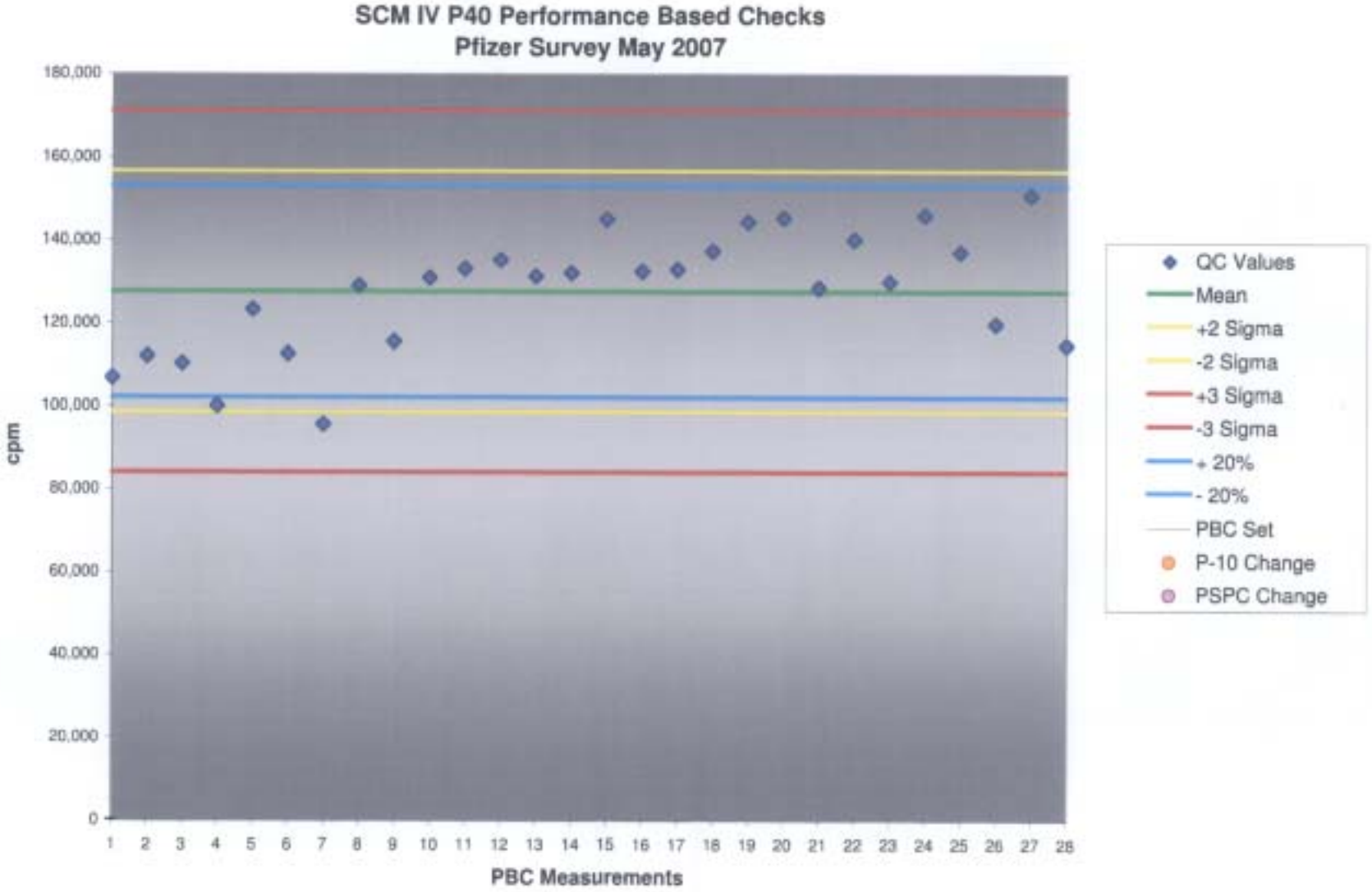
Prior to filling the vessel with Kr-85 gas, the vessel was evacuated to <5 mm Hg, the gas manifold system shut off and the system allowed to stand for a minimum of 30 minutes. A vacuum difference not greater than the known vacuum loss of the manifold system itself signified the vessel did not leak.

☐ ***Leak Test Not Applicable***

The active area of the source is uncovered or is protected by a very thin coating. Although the deposit is adherent, it is not designed or certified to pass a standard leak test. The inactive portions of the source have been checked using the standard wipe test or special wipe test depending on the nuclide. There was <0.001 μCi beta-gamma and <0.0001 μCi alpha of removable activity.

☐ ***Other Leak Test***


SCM IV P100 Performance Based Checks
Pfizer Survey May 2007
cpm
150,000
140,000
130,000
120,000
110,000
100,000
90,000
80,000
70,000
60,000
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37
PBC Measurements
QC Values
Mean
+2 Sigma
-2 Sigma
+3 Sigma
-3 Sigma
+ 20%
- 20%
PBC Set
P-10 Change
PSPC Change


SCM IV P40 Performance Based Checks
Pfizer Survey May 2007
cpm
180,000
160,000
140,000
120,000
100,000
80,000
60,000
40,000
20,000
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28
PBC Measurements
QC Values
Mean
+2 Sigma
-2 Sigma
+3 Sigma
-3 Sigma
+ 20%
- 20%
PBC Set
P-10 Change
PSPC Change

GRIFFIN INSTRUMENTS

CALIBRATION CERTIFICATE FOR 2221 SERIAL# 126501

Owner: CHASE ENV

DATE: 01/04/07 LOCATION: Griffin Inst

TECH: Joanne Glenn DATE LAST CAL EXPIRES: 01/07/07

Reason For Calibration: (•) Due For Calibration ( ) Repair (See Remarks)

( ) Other (See Remarks) ( ) Due and Repair (See Remarks)

NIST TRACEABLE EQUIPMENT USED DURING CALIBRATION

MODEL: M-500 SERIAL #: 114512 CAL. DUE: 12/11/07

MODEL: SERIAL #: CAL DUE:

[x] Fast/Slow Switch working properly [x] Audio Response [x] Geotropism CABLE LENGTH 39"

CONDITION: Set AF MECHANICAL ZERO: 0 AL MECHANICAL ZERO: 0

NEW BATTERIES: ( ) Yes (•) No BATTERY CHECK: 5.1 V

HV	AS FOUND HV	AS LEFT HV
800 V:	602	A.F.
1200 V:	1208	A.F.
1800 V:	1809	A.F.

INPUT SENSITIVITY (mV): 4 AL INPUT SENSITIVITY (mV): A.F.

[redacted]

SCALE	RATE CPM	AS FOUND		% ERROR	AS LEFT	% ERROR	AS FOUND	% ERROR	AS LEFT	% ERROR
x.1 or x1	100	100		0.0%	A.F.		[redacted]			
	250	250		0.0%	A.F.		250	0.0%	A.F.	
	400	400		0.0%	A.F.					
x1 or x10	1000	1000		0.0%	A.F.					
	2500	2500		0.0%	A.F.					
	4000	4000		0.0%	A.F.					
x10 or x100	10K	10	K	0.0%	A.F.					
	25K	25	K	0.0%	A.F.					
	40K	40	K	0.0%	A.F.					
x100 or x1000	100K	100	K	0.0%	A.F.					
	250K	250	K	0.0%	A.F.					
	400K	400	K	0.0%	A.F.					

Is the As Found Data Within 20% of the Set Point?: (•) Yes ( ) No

[redacted]

SCALE	RATE CPM	AS FOUND		% ERROR	AS LEFT	% ERROR
Log	200	200		0.0%	A.F.	
	2000	2000		0.0%	A.F.	
	20K	20	K	0.0%	A.F.	
	200K	200	K	0.0%	A.F.	

Is the As Found Data Within 20% of the Set Point?: (•) Yes ( ) No

GRIFFIN INSTRUMENTS

SERIAL # 126501
01/04/07

Audio Divide:	◉ Sat ○ Unsat	Push Buttons:	◉ Sat ○ Unsat
Lamp:	◉ Sat ○ Unsat	Scaler/Digital:	◉ Sat ○ Unsat

Remarks: Calibrated w/43-68 #PR149839.

Does Instrument Meet Final Acceptance Criteria?:	◉ Yes	○ No
Calibration Sticker Attached?:	◉ Yes	○ No
Date Instrument is Due For Next Calibration:	01/04/08	

Performed/Reviewed by: James Glover Date: 1/4/2007 Entered by:_____Initials

GRIFFIN INSTRUMENTS
977 Hamilton Lane
Kingston, TN 37763
865-376-1313
e-mail - griffininst@comcast.net

CALIBRATION DATA SHEET

MODEL #	SERIAL #	CALIBRATION DATE	CALIBRATION DUE
43-68	PR149839	1/4/07	1/4/08
PERFORMED BY	**LOCATION**	**PHYSICAL COND.**	**AUDIO RESPONSE**
Joanne Glenn	Griffin Instruments	SAT	SAT
ISOTOPE	**SERIAL #**	**ASSAY DATE**	**DPM**
Tc99	99TC470-1814	8/3/99	37,300
ISOTOPE	**SERIAL #**	**ASSAY DATE**	**DPM**
Sr90	2697-00	3/1/00	12,200
ISOTOPE	**SERIAL #**	**ASSAY DATE**	**DPM**
C14	DX 295	5/3/94	67,800

HEATED DATA		
HV	BK	CPM
N/A		

HV Set Point: 1750 V **Threshold:** 4 mV i.s. (40)

ISOTOPE	CNT-BKG-DPM	% EFFICIENCY
Tc99	10025 - 470 Bkg	25.62%
Sr90	4869 - 470 Bkg	36.05%
C14	8529 - 470 Bkg	11.89%

Remarks: Probe no longer modified with cardboard facing. Geometry: Flat surface

Calibrated/Reviewed By: Joanne Glenn Date: 1/4/07

Pfizer Global Research and Development
Plymouth Township Facility
Characterization Survey Package

Building: PTF	Survey Unit: PF01	Page 1 of ____

Classification:	☐ Class 1	☒ Class 2	☐ Class 3	☐ System

Nuclides of Concern:	☒ ^{3}H	☒ ^{14}C			
$DCGL_W$ (dpm/100cm²)	1.2E8	3.7E6			
Investigation Level – Total Surface Activity (dpm/100cm²)	N/A	5,000			
Investigation Level – Removable Surface Activity (dpm/100cm²)	200	200			

Applicable Survey Unit Surfaces:		Percent of Surface Requiring Scan			Documentation of Completion
☒	Floors	☐ 10%	☐ 20%	☒ 50%	Date Completed: _____ Initials: _____
☒	Benchtops	☐ 10%	☐ 20%	☒ 50%	Date Completed: _____ Initials: _____
☒	Fume Hoods	☐ 10%	☐ 20%	☒ 50%	Date Completed: _____ Initials: _____
☒	Lower Walls	☐ 10%	☐ 20%	☒ 50%	Date Completed: _____ Initials: _____
☒	Casework Exteriors	☐ 10%	☐ 20%	☒ 50%	Date Completed: _____ Initials: _____
☒	Laboratory Drawers and Shelves	☐ 10%	☐ 20%	☒ 50%	Date Completed: _____ Initials: _____
☐	Upper Walls	☐ 10%	☐ 20%	☐ 50%	Date Completed: _____ Initials: _____
☐	Ceilings	☐ 10%	☐ 20%	☐ 50%	Date Completed: _____ Initials: _____
☒	Other Structures	☐ 10%	☐ 20%	☒ 50%	Date Completed: _____ Initials: _____

Required Instrumentation		Measurement Type	Static Count Time	Maximum Scan Rate (inches/sec.)	Based on:	Typical Static MDCR
☒	SRA LabRATS	Beta	5 sec.	7.8	^{14}C	555 cpm
☐	Ludlum 43-68	Beta	10 sec. 60 sec. bkg.	5	^{14}C	169 cpm
☐	Ludlum 43-37 Floor Monitor	Beta	10 sec. 60 sec. bkg.	5	^{14}C	50 cpm
☐	Other: _____ (Specify)					
☒	A Liquid Scintillation Counter shall be used for analysis of any required removable contamination measurements.					

Pfizer Global Research and Development
Plymouth Township Facility
Characterization Survey Package

Building: PTF	Survey Unit: PF01	Page 2 of ____

General Survey Instructions:

1. Perform scan surveys of the required surface area at the prescribed scan rates with the SRA LabRATS surface contamination monitor. Surveys may be augmented with Ludlum instrumentation with the Project Manager's approval.
2. For survey areas with less than 100% scan coverage, select surfaces with the highest potential for residual contamination, such as areas of stains, light switches, door pushes, drawer handles, etc.
3. Manage the scan data in strips by room and surface (i.e., Room 1 floors, Room 2 benchtops, etc.) Document strip numbers in this package. Any strip that has contaminated surfaces will be resurveyed in its entirety after remediation and assigned a new number.
4. If a scan speed alarm is initiated, stop, back up, and resurvey the affected surface.
5. Judgmentally select locations on vertical surfaces with the highest probability for contamination such as light switches, door pulls, drawer handles, stained areas, etc. Collect a minimum of 10 smears per survey unit.
6. If any elevated activity is detected during the scan surveys as indicated by an alarm, establish the extent (size) of the contaminated area(s), mark the affected area(s) and quantify the activity by taking static measurements and smears of the affected area(s). Document the type, amount and extent of any contamination in this survey package, including sketching the area on the survey unit map, and notify the Project Manager. Complete the current survey strip to ensure all areas of elevated activity are identified within the strip.
7. Notify the Project Manager if any total or removable contamination measurement exceeds the applicable investigation level.

Survey Unit Classification	Flag Direct Measurement or Sample Result When:	Flag Beta Scanning Measurement Result When:	Flag Removable Measurement Result When:
All	> 5,000 dpm/100 cm^2	> 5,000 dpm/100 cm^2	> 200 dpm/100 cm^2 in any channel

8. Upon completion of the survey unit scans, download survey unit data for processing by the Project Manager. Document all other survey results on the applicable survey maps and data results sheets.
9. Ensure that all package information is completed and signed prior to turning in this Survey Package to the Project Manager for review.

Special Survey Instructions:

Pfizer Global Research and Development
Plymouth Township Facility
Characterization Survey Package

Building: PTF	Survey Unit: PF01	

SRA LabRATS Survey Strip Log												
Room	Floors		Benchtops		Casework		Walls		Hoods		Drawers	
	Initial	Resurvey	Initial	Resurvey	Initial	Resurvey	Initial	Resurvey	Initial	Resurvey	Initial	Resurvey

Pfizer Global Research and Development
Plymouth Township Facility
Characterization Survey Package

Building: PTF	Survey Unit: PF01	Page 4 of ___

Additional Survey Data (other than LabRATS data)					
Inst. #1	Inst Type:	Inst. S/N	Cal Due Date:	MDCR:	BKG (cpm)
	Probe Type:	Probe S/N	Inst Eff:	Count Time:	
Inst. #2	Inst Type:	Inst. S/N	Cal Due Date:	MDCR:	BKG (cpm)
	Probe Type:	Probe S/N	Inst Eff:	Count Time:	
Inst. #3	Inst Type:	Inst. S/N	Cal Due Date:	MDCR:	BKG (cpm)
	Probe Type:	Probe S/N	Inst Eff:	Count Time:	

Survey Location (Specify Room and Surface, also Document on Map)	Static Measurement Survey Results			Smear Results		
	Gross Counts (cpm/probe)	Net Counts (cpm/probe)	Net Activity (dpm/100cm^2)	Net Activity (dpm/100cm^2)		
				CH 1	CH 2	CH 3

Pfizer Global Research and Development
Plymouth Township Facility
Characterization Survey Package

Building: PTF	Survey Unit: PF01	Page 5 of ___

Areas of Elevated Activity:

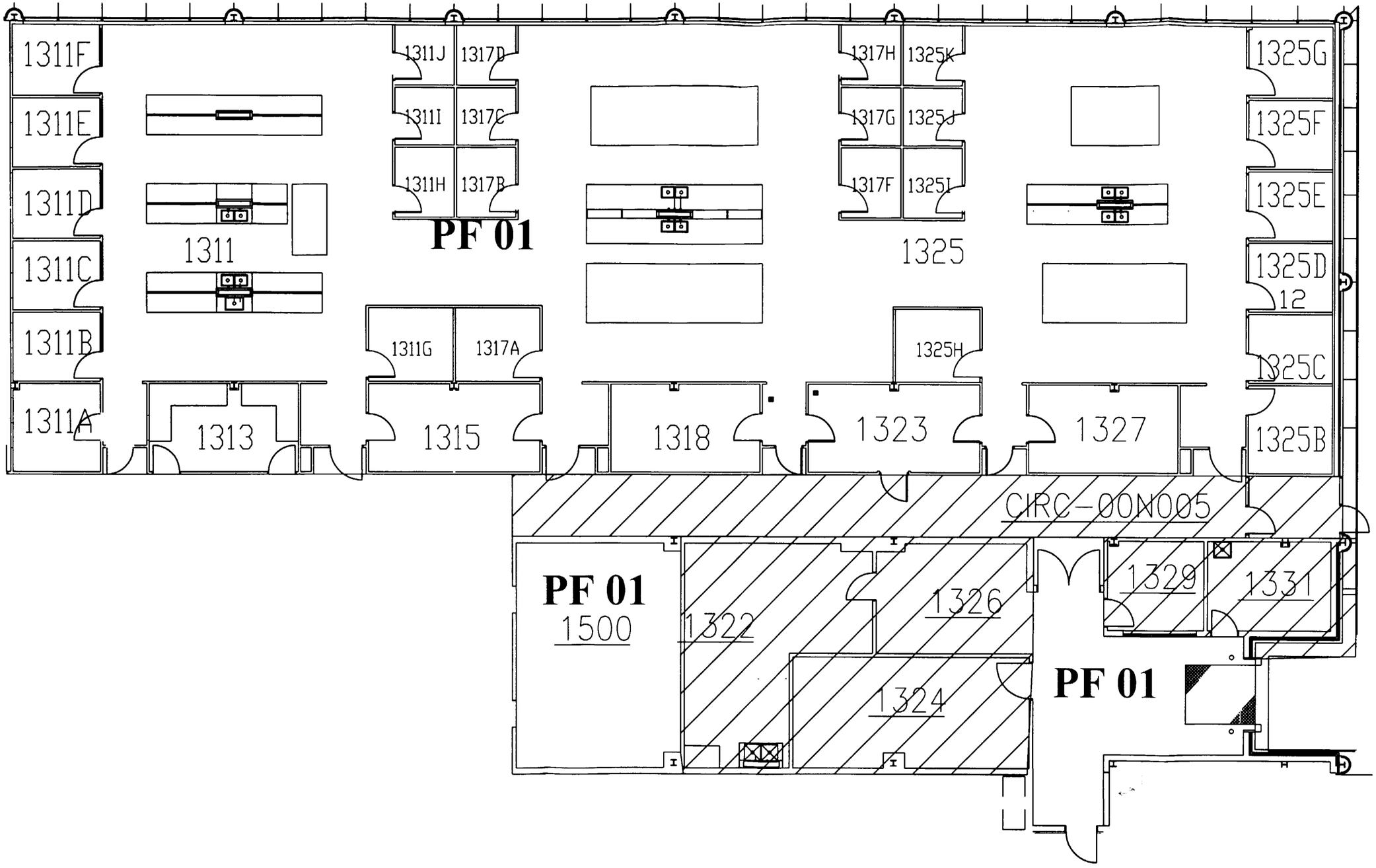
Room	Surface	Area (ft^2)	Maximum Activity ($dpm/100cm^2$)		Average Activity ($dpm/100cm^2$)	
			Total	Removable	Total	Removable

Surveyor Comments:

Pfizer Global Research and Development
Plymouth Township Facility
Characterization Survey Package

Building: PTF	Survey Unit: PF01	Page 6 of ____

Package Signatures:	
Survey Package Preparation	
Package Prepared By:	Date:
Preparation Reviewed By:	Date:
Survey Completion	
Survey Completed by:	Date:
Survey Completed by:	Date:
Survey Package Review and Closeout	
Package Reviewed by:	Date:



Pfizer Global Research and Development Plymouth Township Facility Characterization Survey Package		
Building: PTF	Survey Unit: PF01	Page: of

Survey Information	
Survey Unit:	PF01
Survey Date:	5/15/2007
PSE4 Serial Number:	PSPC4 #3 10/02/06 B#268
PSPC Efficiency (100cm^2):	0.18 (C-14)
Background (cpm):	360
Surveyor(s):	Dave Culp
Software Suite Version:	1.3.1.0
Criteria	
Hotspot Alarm (100 cm^2):	5,000 dpm
Large Area Alarm (1 m^2):	15,000 dpm
Descriptive Statistics	
Number of Measurements:	310,681
Mean (dpm/100 cm^2):	-152
Median (dpm/100 cm^2):	-515
StdDev (dpm/100 cm^2):	1,693
Scan MDC Parameters (Beta)[1]	
Index of Sensitivity, d':	1.38
Background (cpm):	360
Surveyor Efficiency, p:	1
Detector Area (cm^2):	100
Survey Results	
Maximum Hotspot (100 cm^2):	14,190 dpm
Maximum Average (1 m^2):	3,345 dpm
Maximum Scan MDC (dpm/100 cm^2):	2,585
Average Scan Speed (cm/sec):	12.4

[1]The Scan Minimum Detectable Concentration (MDC) for Beta emissions is calculated using equation 6.10 from MARSSIM.

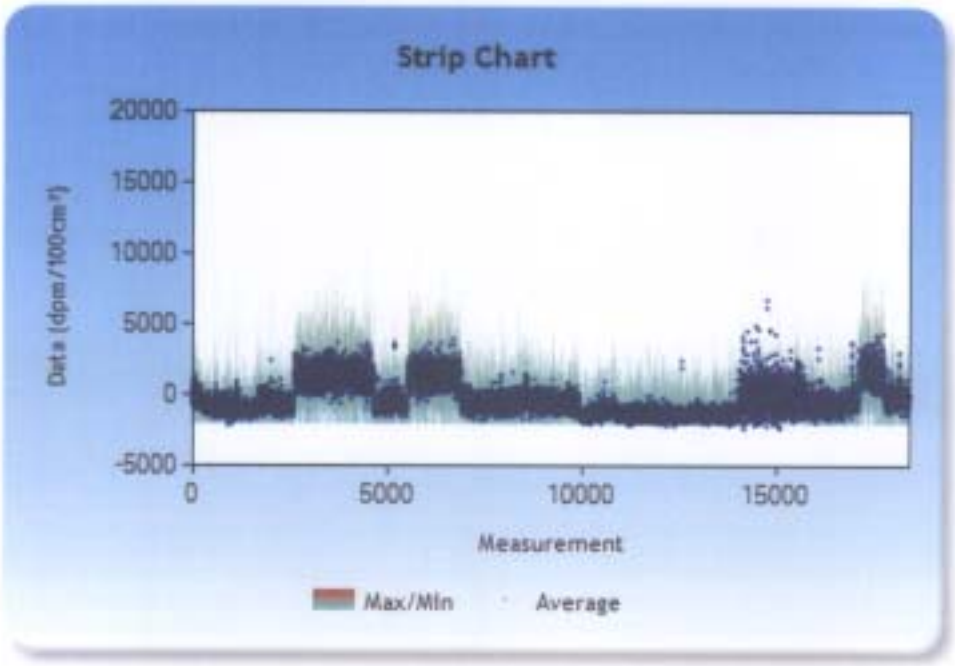


Figure 1: Maximum and Minimum Surface Activity per Acquisition

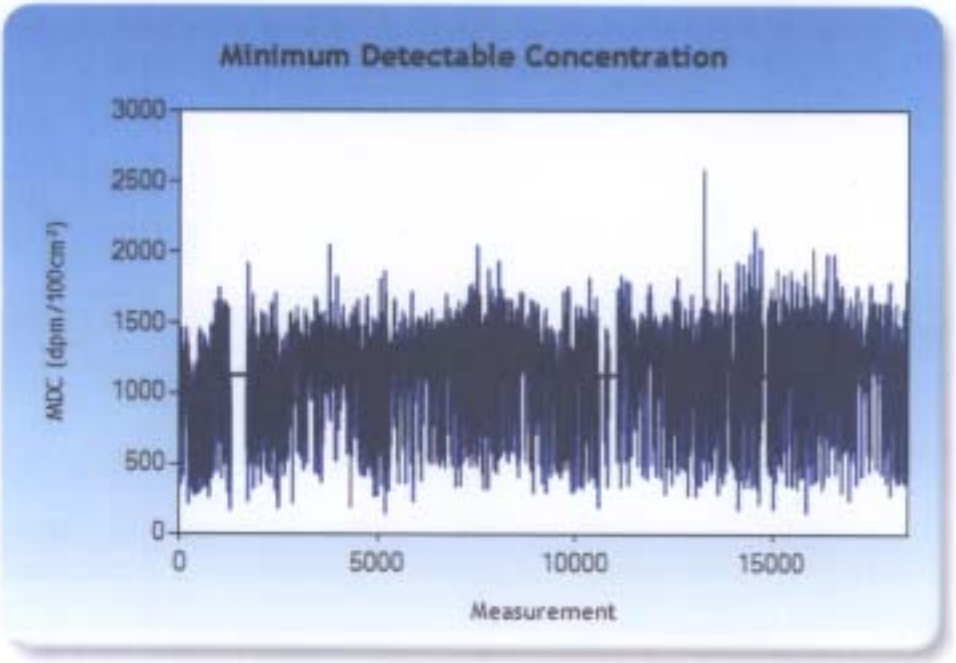


Figure 2: Scan MDC per Acquisition

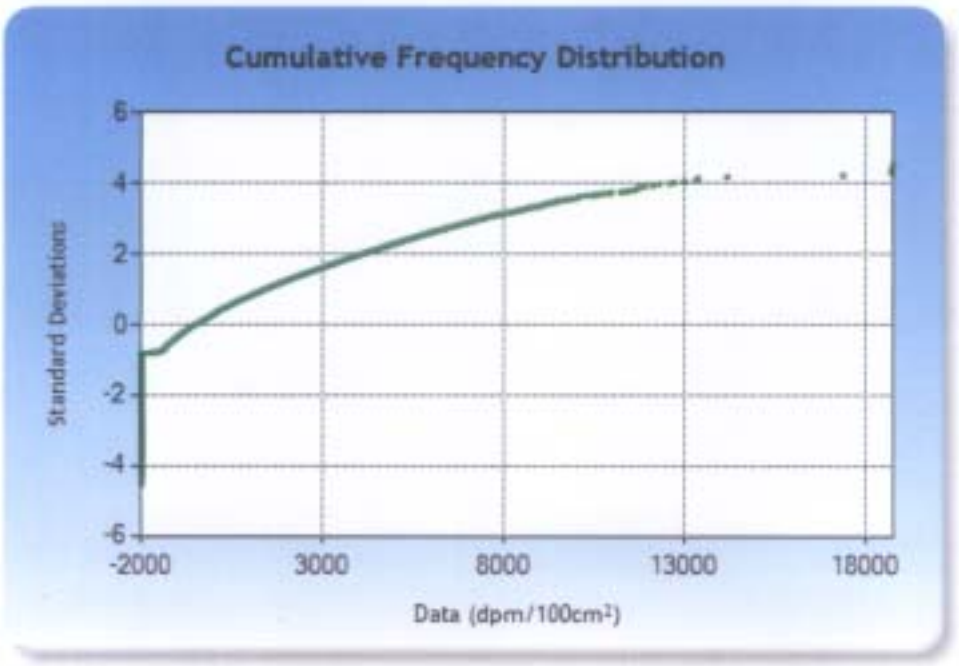


Figure 3: Cumulative Frequency Distribution of Surface Activity

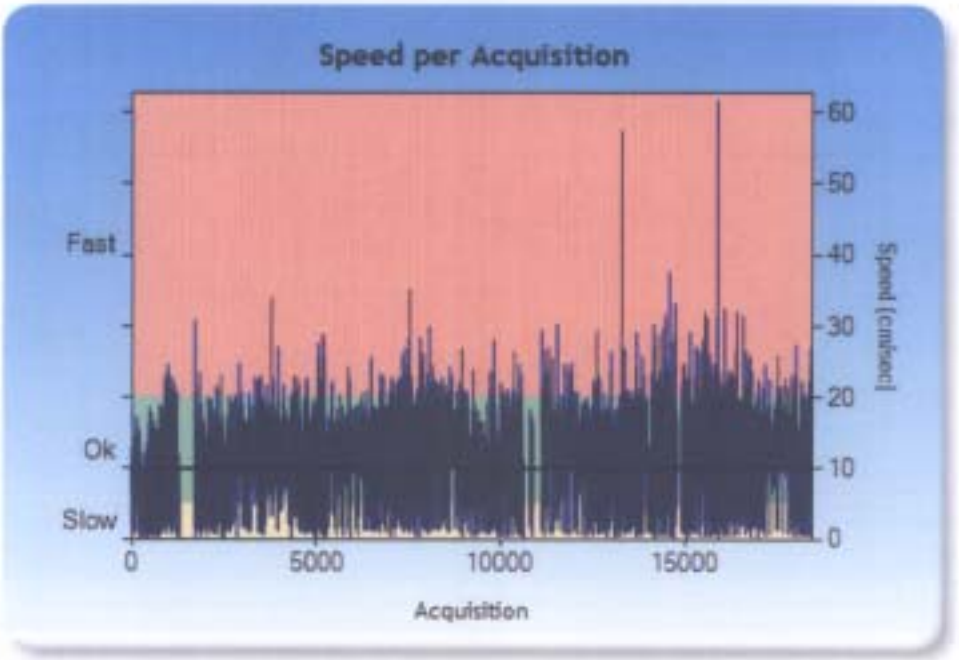


Figure 4: Survey Scan Speed

Survey Information	
Survey Unit:	PF02
Survey Date:	5/15/2007
PSE4 Serial Number:	PSPC4 #3 10/02/06 B#268
PSPC Efficiency (100cm^2):	0.18 (C-14)
Background (cpm):	360
Surveyor(s):	Dave Culp
Software Suite Version:	1.3.1.0
Criteria	
Hotspot Alarm (100 cm^2):	5,000 dpm
Large Area Alarm (1 m^2):	15,000 dpm
Descriptive Statistics	
Number of Measurements:	159,563
Mean (dpm/100 cm^2):	-188
Median (dpm/100 cm^2):	-349
StdDev (dpm/100 cm^2):	1,353
Scan MDC Parameters (Beta)[1]	
Index of Sensitivity, d':	1.38
Background (cpm):	360
Surveyor Efficiency, p:	1
Detector Area (cm^2):	100
Survey Results	
Maximum Hotspot (100 cm^2):	13,826 dpm
Maximum Average (1 m^2):	1,708 dpm
Maximum Scan MDC (dpm/100 cm^2):	1,918
Average Scan Speed (cm/sec):	12.1

[1]The Scan Minimum Detectable Concentration (MDC) for Beta emissions is calculated using equation 6.10 from MARSSIM.

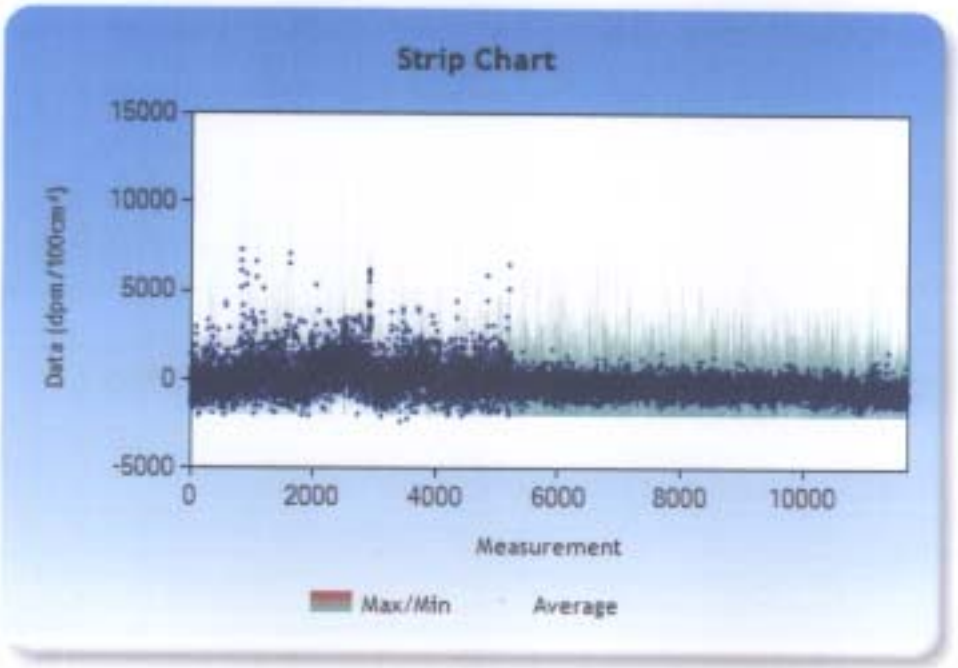


Figure 1: Maximum and Minimum Surface Activity per Acquisition

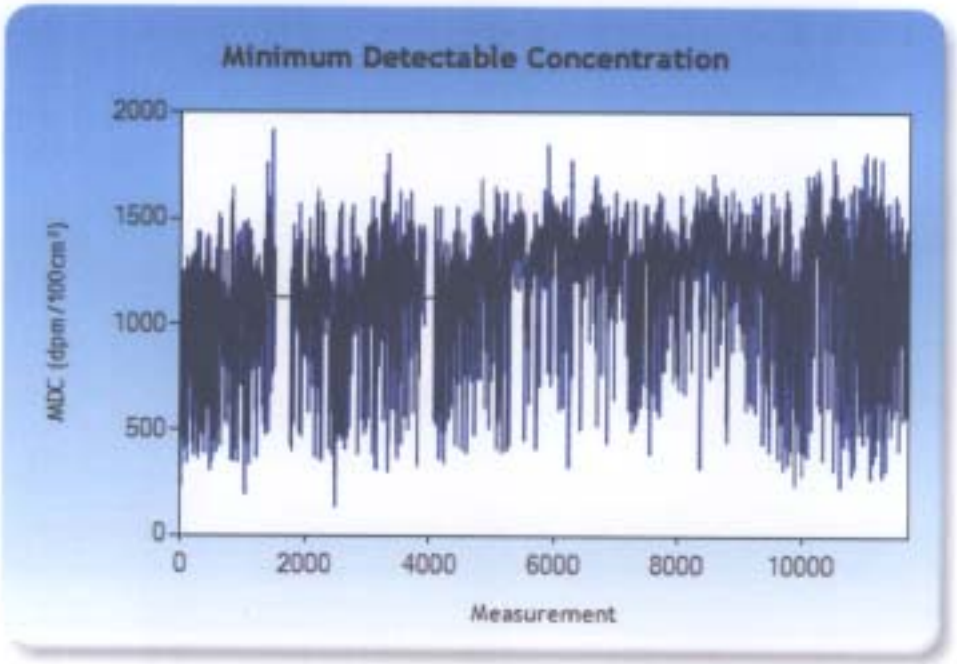


Figure 2: Scan MDC per Acquisition

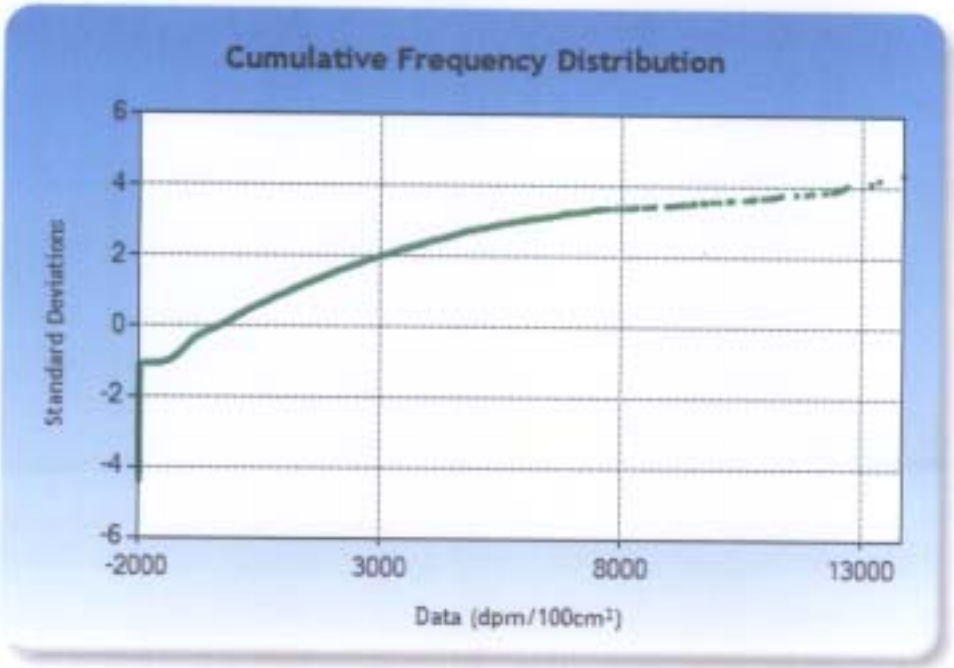


Figure 3: Cumulative Frequency Distribution of Surface Activity

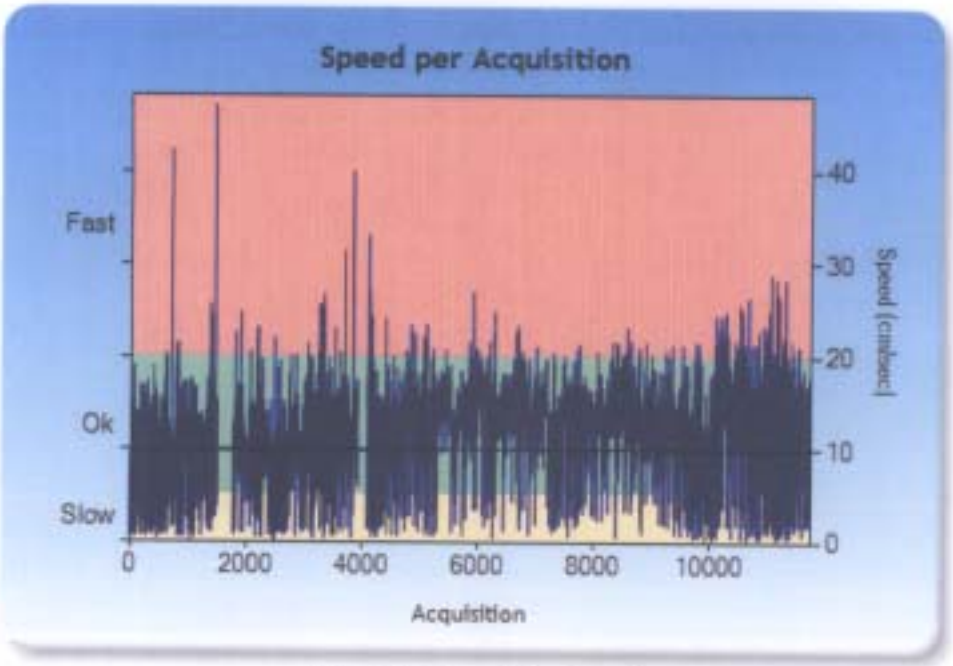


Figure 4: Survey Scan Speed

Survey Information	
Survey Unit:	PF03
Survey Date:	5/17/2007
PSE4 Serial Number:	PSPC4 #3 10/02/06 B#268
PSPC Efficiency (100cm^2):	0.18 (C-14)
Background (cpm):	360
Surveyor(s):	Dave Culp
Software Suite Version:	1.3.1.0
Criteria	
Hotspot Alarm (100 cm^2):	5,000 dpm
Large Area Alarm (1 m^2):	15,000 dpm
Descriptive Statistics	
Number of Measurements:	320,408
Mean (dpm/100 cm^2):	-266
Median (dpm/100 cm^2):	-460
StdDev (dpm/100 cm^2):	1,341
Scan MDC Parameters (Beta)[1]	
Index of Sensitivity, d':	1.38
Background (cpm):	360
Surveyor Efficiency, p:	1
Detector Area (cm^2):	100
Survey Results	
Maximum Hotspot (100 cm^2):	13,333 dpm
Maximum Average (1 m^2):	2,056 dpm
Maximum Scan MDC (dpm/100 cm^2):	2,545
Average Scan Speed (cm/sec):	12.4

[1]The Scan Minimum Detectable Concentration (MDC) for Beta emissions is calculated using equation 6.10 from MARSSIM.

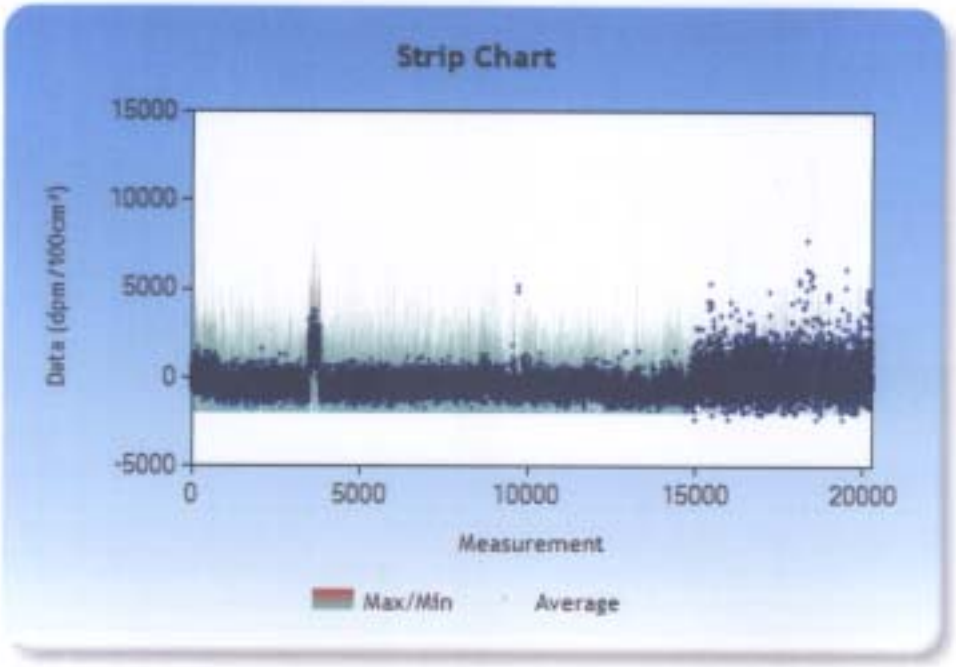


Figure 1: Maximum and Minimum Surface Activity per Acquisition

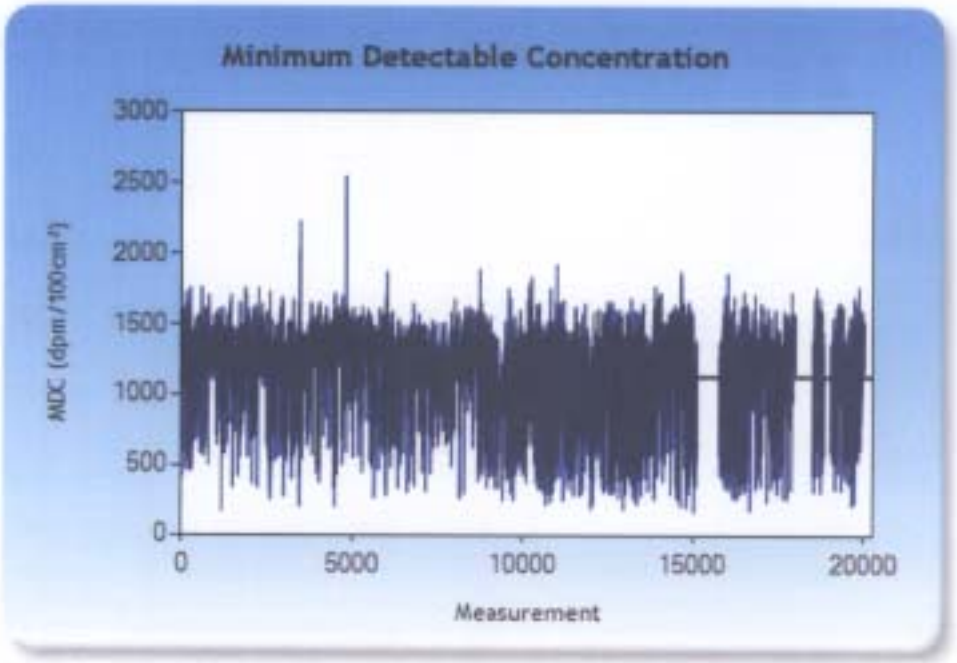


Figure 2: Scan MDC per Acquisition

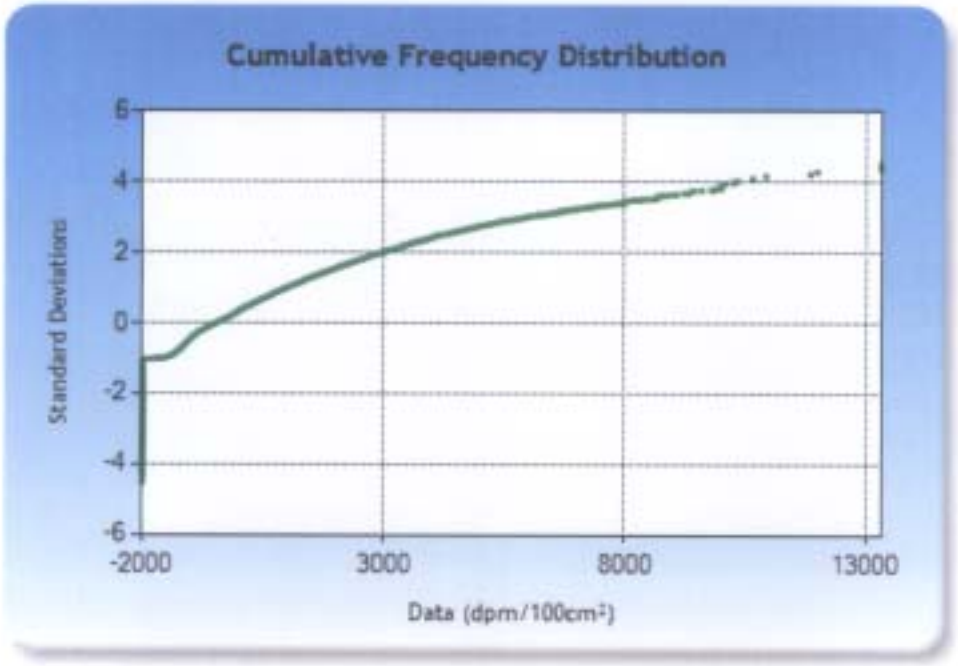


Figure 3: Cumulative Frequency Distribution of Surface Activity

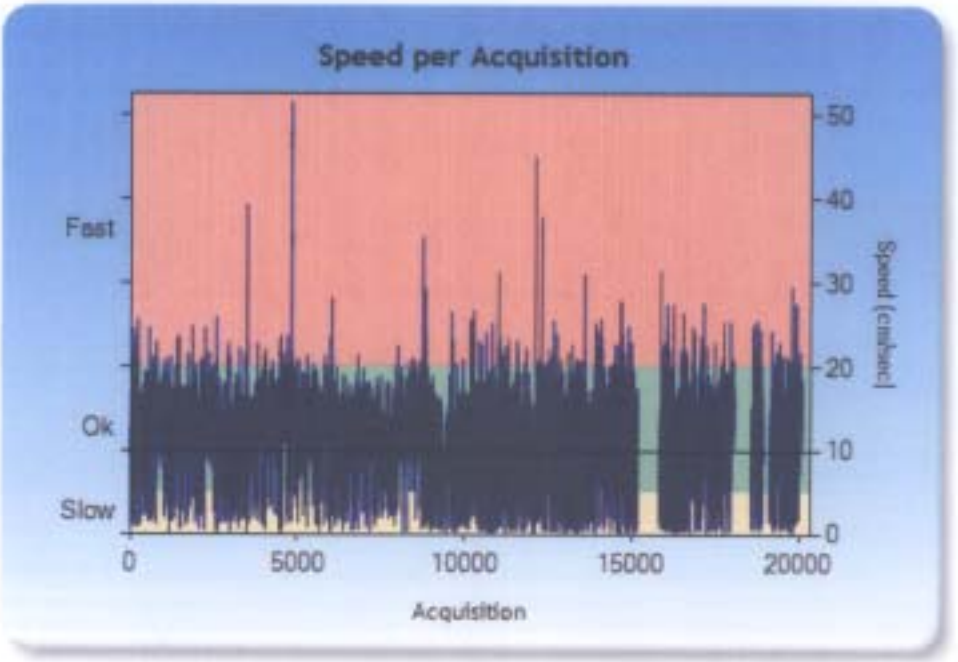


Figure 4: Survey Scan Speed

Survey Information	
Survey Unit:	PF04
Survey Date:	5/16/2007
PSE4 Serial Number:	PSPC4 #3 10/02/06 B#268
PSPC Efficiency (100cm^2):	0.18 (C-14)
Background (cpm):	360
Surveyor(s):	Randy West
Software Suite Version:	1.3.1.0
Criteria	
Hotspot Alarm (100 cm^2):	5,000 dpm
Large Area Alarm (1 m^2):	15,000 dpm
Descriptive Statistics	
Number of Measurements:	155,436
Mean (dpm/100 cm^2):	-127
Median (dpm/100 cm^2):	-312
StdDev (dpm/100 cm^2):	1,288
Scan MDC Parameters (Beta)[1]	
Index of Sensitivity, d':	1.38
Background (cpm):	360
Surveyor Efficiency, p:	1
Detector Area (cm^2):	100
Survey Results	
Maximum Hotspot (100 cm^2):	13,870 dpm
Maximum Average (1 m^2):	1,098 dpm
Maximum Scan MDC (dpm/100 cm^2):	2,223
Average Scan Speed (cm/sec):	10.7

[1]The Scan Minimum Detectable Concentration (MDC) for Beta emissions is calculated using equation 6.10 from MARSSIM.

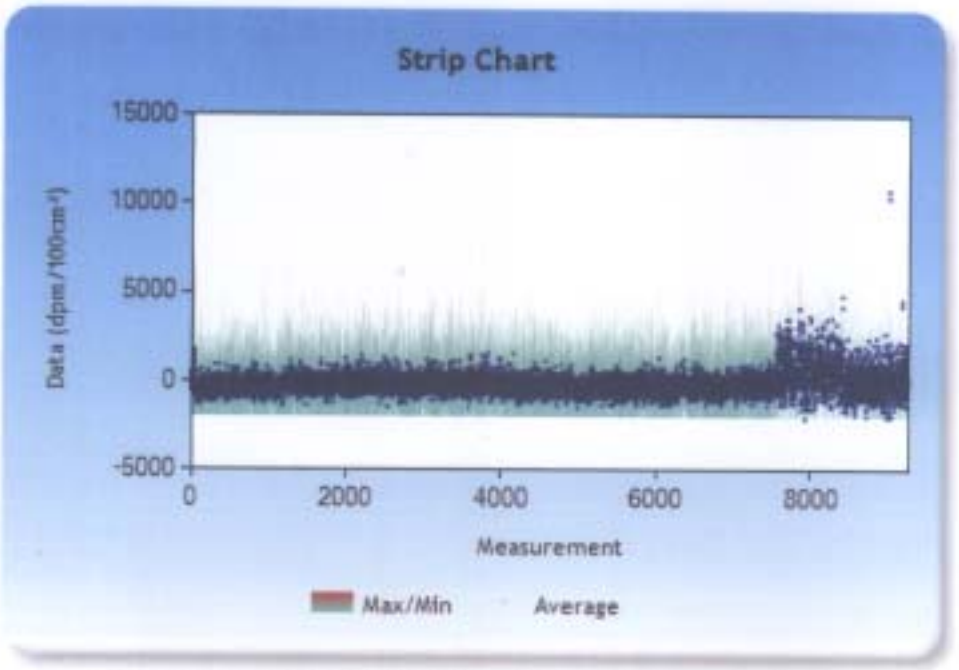


Figure 1: Maximum and Minimum Surface Activity per Acquisition

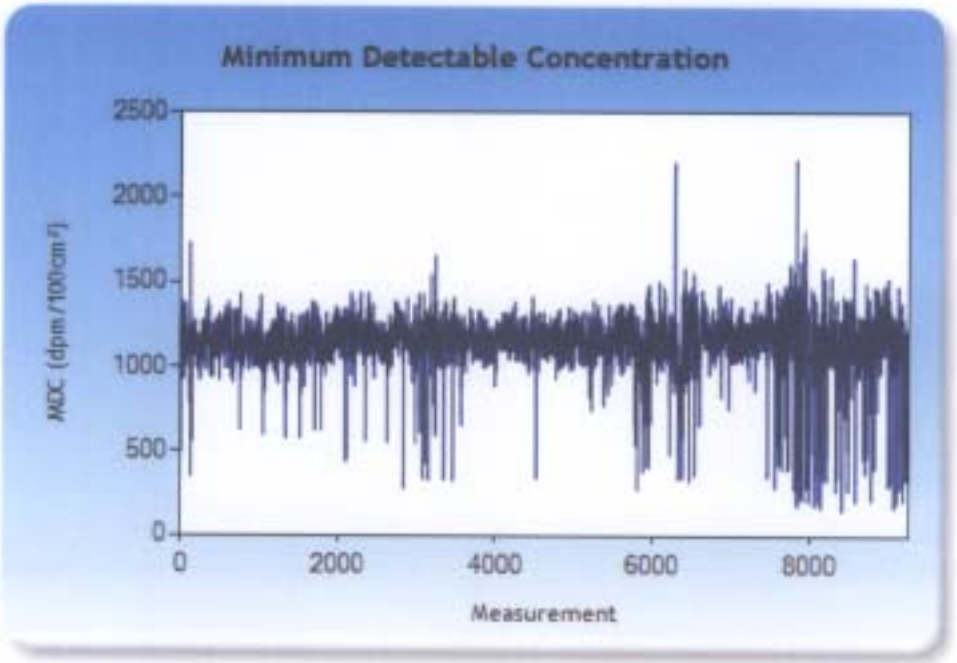


Figure 2: Scan MDC per Acquisition

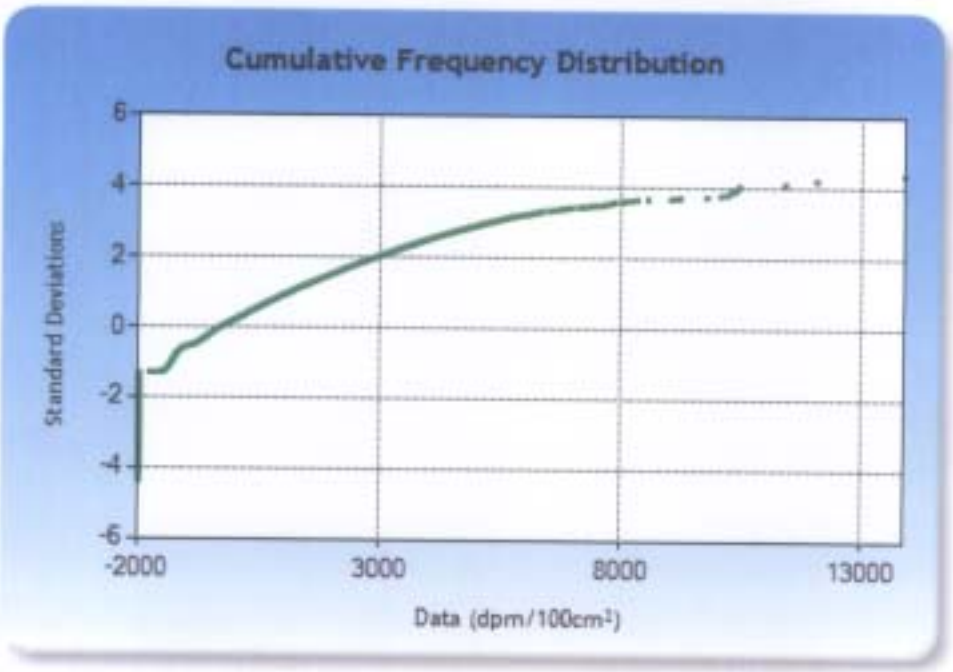


Figure 3: Cumulative Frequency Distribution of Surface Activity

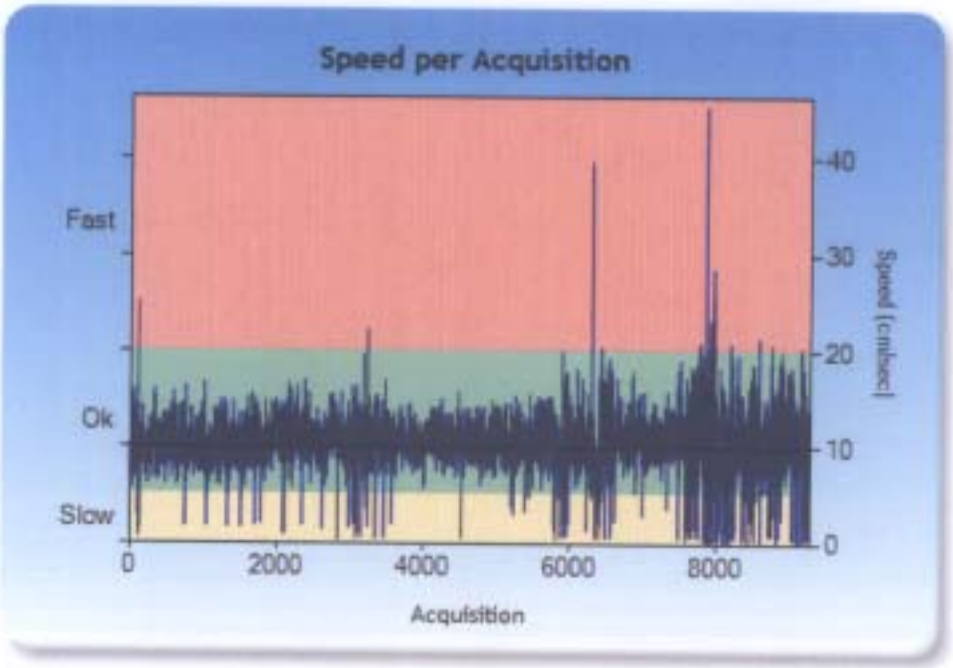


Figure 4: Survey Scan Speed

Survey Information	
Survey Unit:	PF05
Survey Date:	5/16/2007
PSE4 Serial Number:	PSPC4 #3 10/02/06 B#268
PSPC Efficiency (100cm^2):	0.18 (C-14)
Background (cpm):	360
Surveyor(s):	Randy West
Software Suite Version:	1.3.1.0
Criteria	
Hotspot Alarm (100 cm^2):	5,000 dpm
Large Area Alarm (1 m^2):	15,000 dpm
Descriptive Statistics	
Number of Measurements:	80,054
Mean (dpm/100 cm^2):	133
Median (dpm/100 cm^2):	-101
StdDev (dpm/100 cm^2):	1,489
Scan MDC Parameters (Beta)[1]	
Index of Sensitivity, d':	1.38
Background (cpm):	360
Surveyor Efficiency, p:	1
Detector Area (cm^2):	100
Survey Results	
Maximum Hotspot (100 cm^2):	11,532 dpm
Maximum Average (1 m^2):	2,441 dpm
Maximum Scan MDC (dpm/100 cm^2):	1,944
Average Scan Speed (cm/sec):	10.7

[1]The Scan Minimum Detectable Concentration (MDC) for Beta emissions is calculated using equation 6.10 from MARSSIM.

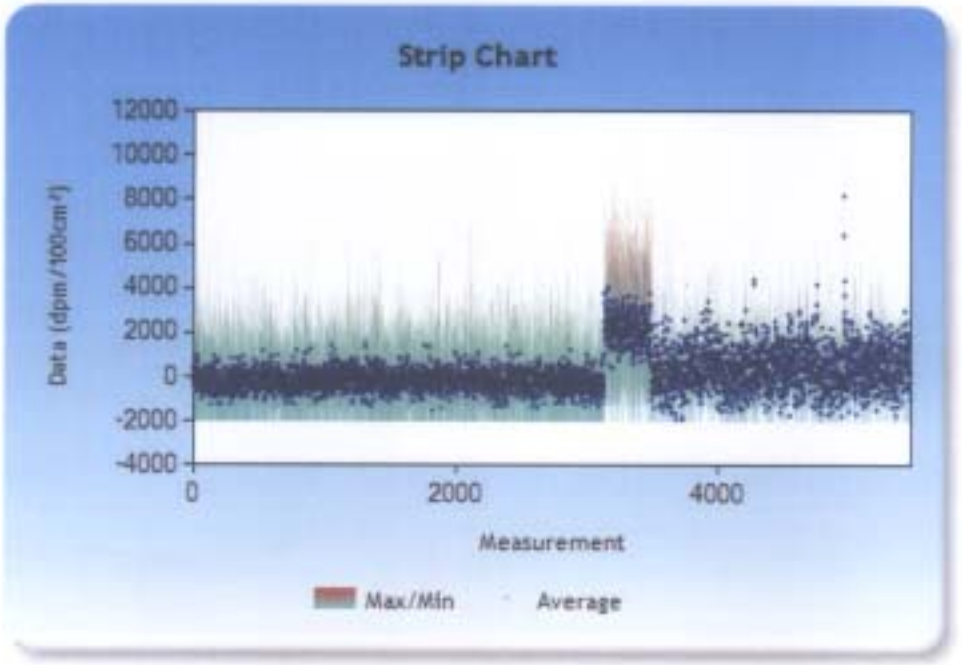


Figure 1: Maximum and Minimum Surface Activity per Acquisition

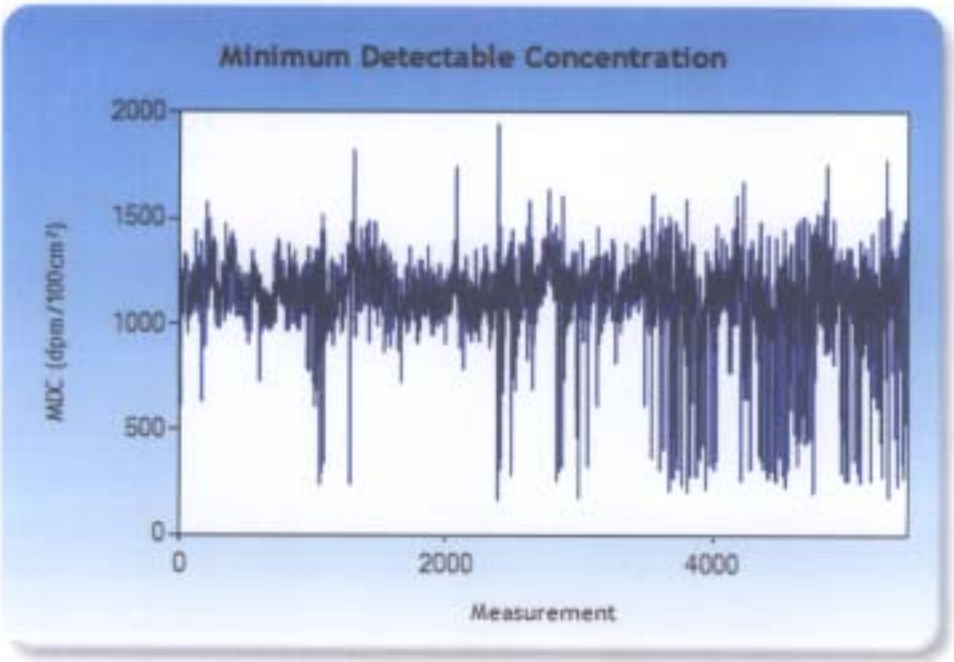


Figure 2: Scan MDC per Acquisition

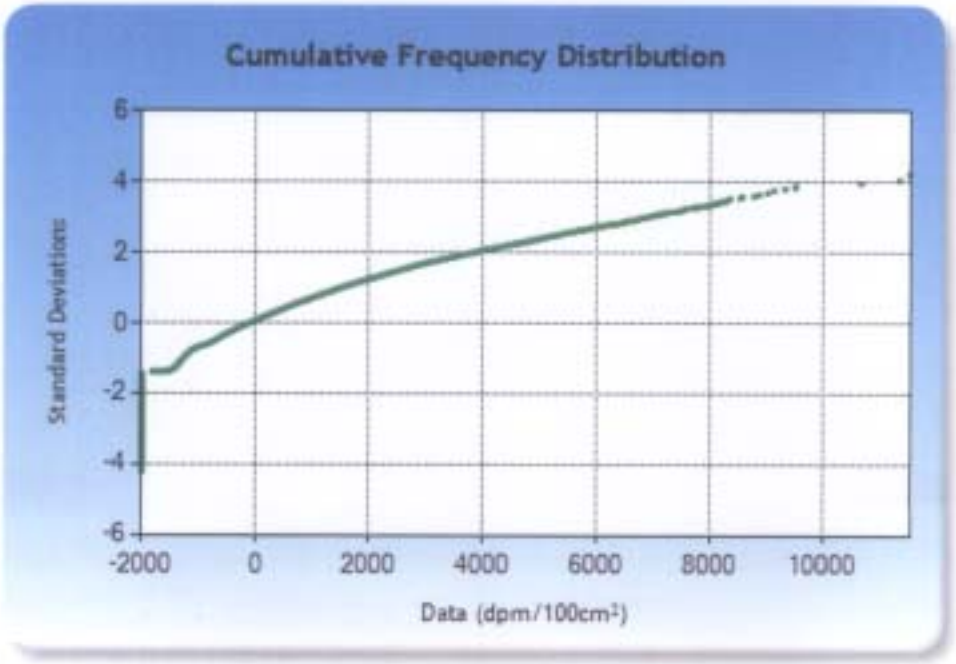


Figure 3: Cumulative Frequency Distribution of Surface Activity

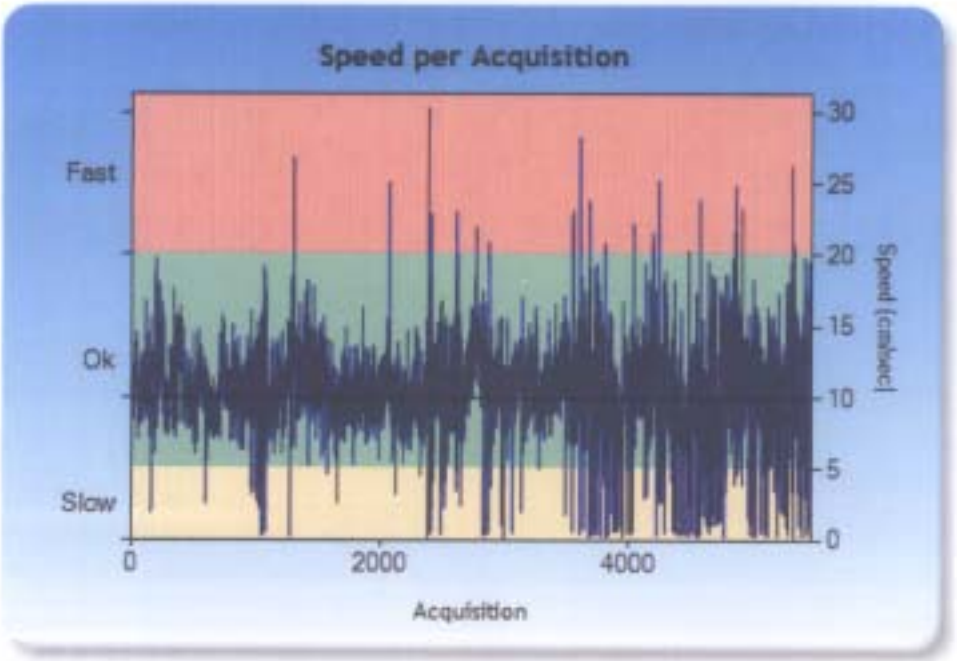


Figure 4: Survey Scan Speed

Building Systems Final Status Survey Results

Building PTF Survey Unit D001 Class: N/A

Location Code	Total Beta Activity Measurements		Removable Activity Measurements			
			Tritium		Carbon-14	
	Activty	MDC	Activity	MDC	Activity	MDC
PTF-D001-D1-M-001	N/A	N/A	10 ± 6	19	11 ± 7	20
PTF-D001-D1-M-002	N/A	N/A	11 ± 7	19	9 ± 6	20
PTF-D001-D1-M-003	N/A	N/A	20 ± 9	19	15 ± 8	20
PTF-D001-D1-M-004	N/A	N/A	15 ± 8	19	6 ± 5	20
PTF-D001-D1-M-005	N/A	N/A	24 ± 10	19	11 ± 7	20
PTF-D001-D1-M-006	N/A	N/A	26 ± 10	19	12 ± 7	20
PTF-D001-D1-M-007	N/A	N/A	20 ± 9	19	9 ± 6	20
PTF-D001-D1-M-008	N/A	N/A	25 ± 10	19	10 ± 6	20
PTF-D001-D1-M-009	N/A	N/A	13 ± 7	19	12 ± 7	20
PTF-D001-D1-M-010	N/A	N/A	15 ± 8	19	8 ± 6	20
PTF-D001-D1-M-011	N/A	N/A	23 ± 9	19	9 ± 6	20
PTF-D001-D1-M-012	N/A	N/A	20 ± 9	19	8 ± 6	20
PTF-D001-D1-M-013	N/A	N/A	12 ± 7	19	7 ± 5	20
PTF-D001-D1-M-014	N/A	N/A	16 ± 8	19	11 ± 7	20
PTF-D001-D1-M-015	N/A	N/A	19 ± 9	19	13 ± 7	20
PTF-D001-D1-M-016	N/A	N/A	14 ± 7	19	20 ± 9	20
PTF-D001-D1-M-017	N/A	N/A	22 ± 9	19	9 ± 6	20
PTF-D001-D1-M-018	N/A	N/A	11 ± 7	19	12 ± 7	20
PTF-D001-D1-M-019	N/A	N/A	21 ± 9	19	6 ± 5	20
PTF-D001-D1-M-020	N/A	N/A	13 ± 7	19	13 ± 7	20
PTF-D001-D1-M-021	N/A	N/A	14 ± 7	19	13 ± 7	20
PTF-D001-D1-M-022	N/A	N/A	25 ± 10	19	11 ± 7	20
PTF-D001-D1-M-023	N/A	N/A	18 ± 8	19	16 ± 8	20
PTF-D001-D1-M-024	N/A	N/A	21 ± 9	19	11 ± 7	20
PTF-D001-D1-M-025	N/A	N/A	18 ± 8	19	7 ± 5	20
PTF-D001-D1-M-026	N/A	N/A	23 ± 9	19	11 ± 7	20
PTF-D001-D1-M-027	N/A	N/A	26 ± 10	19	15 ± 8	20
PTF-D001-D1-M-028	N/A	N/A	18 ± 8	19	17 ± 8	20
PTF-D001-D1-M-029	N/A	N/A	21 ± 9	19	13 ± 7	20
PTF-D001-D1-M-030	N/A	N/A	22 ± 9	19	14 ± 7	20
PTF-D001-D1-M-031	N/A	N/A	19 ± 9	19	17 ± 8	20
PTF-D001-D1-M-032	N/A	N/A	22 ± 9	19	10 ± 6	20
PTF-D001-D1-M-033	N/A	N/A	11 ± 7	19	11 ± 7	20
PTF-D001-D1-M-034	N/A	N/A	19 ± 9	19	9 ± 6	20
PTF-D001-D1-M-035	N/A	N/A	23 ± 9	19	10 ± 6	20

Note: All total activity results reported in dpm/100cm^2, all removable activity results reported in gross cpm/100cm^2.

Building Systems Final Status Survey Results

Building PTF Survey Unit D001 Class: N/A

Location Code	Total Beta Activity Measurements		Removable Activity Measurements			
			Tritium		Carbon-14	
	Activty	MDC	Activity	MDC	Activity	MDC
PTF-D001-D1-M-036	N/A	N/A	26 ± 10	19	13 ± 7	20
PTF-D001-D1-M-037	N/A	N/A	19 ± 9	19	2 ± 3	20
PTF-D001-D1-M-038	N/A	N/A	16 ± 8	19	13 ± 7	20
PTF-D001-D1-M-039	N/A	N/A	20 ± 9	19	14 ± 7	20
PTF-D001-D1-M-040	N/A	N/A	11 ± 7	19	12 ± 7	20
PTF-D001-D1-M-041	N/A	N/A	24 ± 10	19	7 ± 5	20
PTF-D001-D1-M-042	N/A	N/A	13 ± 7	19	8 ± 6	20
PTF-D001-D1-M-043	N/A	N/A	22 ± 9	19	5 ± 4	20
PTF-D001-D1-M-044	N/A	N/A	18 ± 8	19	11 ± 7	20
PTF-D001-D1-M-045	N/A	N/A	12 ± 7	19	13 ± 7	20
PTF-D001-D1-M-046	N/A	N/A	13 ± 7	19	15 ± 8	20
PTF-D001-D1-M-047	N/A	N/A	15 ± 8	19	11 ± 7	20
PTF-D001-D1-M-048	N/A	N/A	19 ± 9	19	5 ± 4	20
PTF-D001-D1-M-049	N/A	N/A	11 ± 7	19	11 ± 7	20
PTF-D001-D1-M-050	N/A	N/A	13 ± 7	19	19 ± 9	20
PTF-D001-D1-M-051	N/A	N/A	13 ± 7	19	17 ± 8	20
PTF-D001-D1-M-052	N/A	N/A	16 ± 8	19	8 ± 6	20
PTF-D001-D1-M-053	N/A	N/A	14 ± 7	19	16 ± 8	20
PTF-D001-D1-M-054	N/A	N/A	25 ± 10	19	9 ± 6	20
PTF-D001-D1-M-055	N/A	N/A	14 ± 7	19	11 ± 7	20
PTF-D001-D1-M-056	N/A	N/A	12 ± 7	19	17 ± 8	20
PTF-D001-D1-M-057	N/A	N/A	15 ± 8	19	10 ± 6	20
PTF-D001-D1-M-058	N/A	N/A	32 ± 11	19	9 ± 6	20
PTF-D001-D1-M-059	N/A	N/A	19 ± 9	19	7 ± 5	20
PTF-D001-D1-M-060	N/A	N/A	24 ± 10	19	12 ± 7	20
PTF-D001-D1-M-061	N/A	N/A	28 ± 10	19	16 ± 8	20
PTF-D001-D1-M-062	N/A	N/A	9 ± 6	19	12 ± 7	20
PTF-D001-D1-M-063	N/A	N/A	25 ± 10	19	12 ± 7	20
PTF-D001-D1-M-064	N/A	N/A	22 ± 9	19	8 ± 6	20
PTF-D001-D1-M-065	N/A	N/A	15 ± 8	19	13 ± 7	20
PTF-D001-D1-M-066	N/A	N/A	12 ± 7	19	14 ± 7	20
PTF-D001-D1-M-067	N/A	N/A	14 ± 7	19	8 ± 6	20
PTF-D001-D1-M-068	N/A	N/A	13 ± 7	19	14 ± 7	20
PTF-D001-D1-M-069	N/A	N/A	10 ± 6	19	7 ± 5	20
PTF-D001-D1-M-070	N/A	N/A	21 ± 9	19	7 ± 5	20

Note: All total activity results reported in dpm/100cm^2, all removable activity results reported in gross cpm/100cm^2.

Building Systems Final Status Survey Results

Building PTF Survey Unit D001 Class: N/A

Location Code	Total Beta Activity Measurements		Removable Activity Measurements			
			Tritium		Carbon-14	
	Activty	MDC	Activity	MDC	Activity	MDC
PTF-D001-D1-M-071	N/A	N/A	30 ± 11	19	18 ± 8	20
PTF-D001-D1-M-072	N/A	N/A	31 ± 11	19	14 ± 7	20
PTF-D001-D1-M-073	N/A	N/A	15 ± 8	19	10 ± 6	20
PTF-D001-D1-M-074	N/A	N/A	24 ± 10	19	8 ± 6	20
PTF-D001-D1-M-075	N/A	N/A	13 ± 7	19	8 ± 6	20
PTF-D001-D1-M-076	N/A	N/A	15 ± 8	19	12 ± 7	20
PTF-D001-D1-M-077	N/A	N/A	22 ± 9	19	9 ± 6	20
PTF-D001-D1-M-078	N/A	N/A	20 ± 9	19	17 ± 8	20
PTF-D001-D1-M-079	N/A	N/A	19 ± 9	19	9 ± 6	20
PTF-D001-D1-M-080	N/A	N/A	20 ± 9	19	17 ± 8	20
PTF-D001-D1-M-081	N/A	N/A	20 ± 9	19	22 ± 9	20
PTF-D001-D1-M-082	N/A	N/A	14 ± 7	19	8 ± 6	20
PTF-D001-D1-M-083	N/A	N/A	15 ± 8	19	11 ● 7	20
PTF-D001-D1-M-084	N/A	N/A	19 ± 9	19	8 ± 6	20
PTF-D001-D1-M-085	N/A	N/A	21 ● 9	19	12 ± 7	20
PTF-D001-D1-M-086	N/A	N/A	22 ± 9	19	9 ± 6	20
PTF-D001-D1-M-087	N/A	N/A	20 ± 9	19	20 ● 9	20
PTF-D001-D1-M-088	N/A	N/A	15 ± 8	19	16 ± 8	20
PTF-D001-D1-M-089	N/A	N/A	27 ± 10	19	11 ± 7	20
PTF-D001-D1-M-090	N/A	N/A	16 ± 8	19	15 ± 8	20
PTF-D001-D1-M-091	N/A	N/A	15 ± 8	19	13 ± 7	20
PTF-D001-D1-M-092	N/A	N/A	22 ± 9	19	12 ± 7	20
PTF-D001-D1-M-093	N/A	N/A	16 ± 8	19	20 ± 9	20
PTF-D001-D1-M-094	N/A	N/A	15 ± 8	19	11 ± 7	20
PTF-D001-D1-M-095	N/A	N/A	15 ± 8	19	13 ± 7	20
PTF-D001-D1-M-096	N/A	N/A	17 ± 8	19	7 ± 5	20
PTF-D001-D1-M-097	N/A	N/A	17 ± 8	19	9 ± 6	20
PTF-D001-D1-M-098	N/A	N/A	14 ± 7	19	10 ± 6	20
PTF-D001-D1-M-099	N/A	N/A	20 ± 9	19	12 ± 7	20
PTF-D001-D1-M-100	N/A	N/A	17 ± 8	19	8 ± 6	20
PTF-D001-D1-M-101	N/A	N/A	22 ± 9	19	13 ± 7	20
PTF-D001-D1-M-102	N/A	N/A	18 ± 8	19	11 ± 7	20
PTF-D001-D1-M-103	N/A	N/A	19 ± 9	19	12 ± 7	20
PTF-D001-D1-M-104	N/A	N/A	29 ± 11	19	8 ± 6	20
PTF-D001-D1-M-105	N/A	N/A	24 ± 10	19	9 ± 6	20

Note: All total activity results reported in dpm/100cm^2, all removable activity results reported in gross cpm/100cm^2.

Building Systems Final Status Survey Results

Building PTF Survey Unit D001 Class: N/A

Location Code	Total Beta Activity Measurements		Removable Activity Measurements			
			Tritium		Carbon-14	
	Activty	MDC	Activity	MDC	Activity	MDC
PTF-D001-D1-M-106	N/A	N/A	22 ± 9	19	7 ± 5	20
PTF-D001-D1-M-107	N/A	N/A	16 ± 8	19	5 ± 4	20
PTF-D001-D1-M-108	N/A	N/A	16 ± 8	19	13 ± 7	20
PTF-D001-D1-M-109	N/A	N/A	11 ± 7	19	17 ± 8	20
PTF-D001-D1-M-110	N/A	N/A	13 ± 7	19	11 ± 7	20
PTF-D001-D1-M-111	N/A	N/A	26 ± 10	19	13 ± 7	20
PTF-D001-D1-M-112	N/A	N/A	22 ± 9	19	12 ± 7	20
PTF-D001-D1-M-113	N/A	N/A	13 ± 7	19	10 ± 6	20
PTF-D001-D1-M-114	N/A	N/A	15 ± 8	19	10 ± 6	20
PTF-D001-D1-M-115	N/A	N/A	18 ± 8	19	12 ± 7	20
PTF-D001-D1-M-116	N/A	N/A	19 ± 9	19	8 ± 6	20
PTF-D001-D1-M-117	N/A	N/A	12 ± 7	19	22 ± 9	20
PTF-D001-D1-M-118	N/A	N/A	12 ± 7	19	4 ± 4	20
PTF-D001-D1-M-119	N/A	N/A	11 ± 7	19	14 ± 7	20
PTF-D001-D1-M-120	N/A	N/A	21 ± 9	19	11 ± 7	20
Summary for Survey Unit # D001 (120 detail records)						
Average			18		11	
Minimum			9		2	
Maximum			32		22	
Standard Deviation			5		4	

Note: All total activity results reported in dpm/100cm^2, all removable activity results reported in gross cpm/100cm^2.

Building Systems Final Status Survey Results

Building PTF Survey Unit H001 Class: N/A

Location Code	Total Beta Activity Measurements		Removable Activity Measurements			
			Tritium		Carbon-14	
	Activty	MDC	Activity	MDC	Activity	MDC
PTF-H001-H1-M-001	N/A	N/A	21 ± 9	19	12 ± 7	20
PTF-H001-H1-M-002	N/A	N/A	17 ± 8	19	11 ± 7	20
PTF-H001-H1-M-003	N/A	N/A	15 ± 8	19	17 ± 8	20
PTF-H001-H1-M-004	N/A	N/A	18 ± 8	19	8 ± 6	20
PTF-H001-H1-M-005	N/A	N/A	20 ± 9	19	10 ± 6	20
PTF-H001-H1-M-006	N/A	N/A	24 ± 10	19	12 ± 7	20
PTF-H001-H1-M-007	N/A	N/A	14 ± 7	19	12 ± 7	20
PTF-H001-H1-M-008	N/A	N/A	25 ± 10	19	13 ± 7	20
PTF-H001-H1-M-009	N/A	N/A	23 ± 9	19	12 ± 7	20
PTF-H001-H1-M-010	N/A	N/A	16 ± 8	19	6 ± 5	20
PTF-H001-H1-M-011	N/A	N/A	19 ± 9	19	10 ± 6	20
PTF-H001-H1-M-012	N/A	N/A	20 ± 9	19	17 ± 8	20
PTF-H001-H1-M-013	N/A	N/A	18 ± 8	19	12 ± 7	20
PTF-H001-H1-M-014	N/A	N/A	14 ± 7	19	12 ± 7	20
PTF-H001-H1-M-015	N/A	N/A	22 ± 9	19	12 ± 7	20
PTF-H001-H1-M-016	N/A	N/A	21 ± 9	19	10 ± 6	20
PTF-H001-H1-M-017	N/A	N/A	16 ± 8	19	15 ± 8	20
PTF-H001-H1-M-018	N/A	N/A	34 ± 11	19	15 ± 8	20
PTF-H001-H1-M-019	N/A	N/A	25 ± 10	19	9 ± 6	20
PTF-H001-H1-M-020	N/A	N/A	19 ± 9	19	11 ± 7	20
PTF-H001-H1-M-021	N/A	N/A	95 ± 19	19	10 ± 6	20
PTF-H001-H1-M-022	N/A	N/A	13 ± 7	19	10 ± 6	20
PTF-H001-H1-M-023	N/A	N/A	26 ± 10	19	12 ± 7	20
PTF-H001-H1-M-024	N/A	N/A	23 ± 9	19	11 ± 7	20
PTF-H001-H1-M-025	N/A	N/A	18 ± 8	19	8 ± 6	20
PTF-H001-H1-M-026	N/A	N/A	14 ± 7	19	7 ± 5	20
PTF-H001-H1-M-027	N/A	N/A	17 ± 8	19	11 ± 7	20
PTF-H001-H1-M-028	N/A	N/A	20 ± 9	19	18 ± 8	20
PTF-H001-H1-M-029	N/A	N/A	21 ± 9	19	8 ± 6	20
PTF-H001-H1-M-030	N/A	N/A	21 ± 9	19	18 ± 8	20
PTF-H001-H1-M-031	N/A	N/A	28 ± 10	19	12 ± 7	20
PTF-H001-H1-M-032	N/A	N/A	33 ± 11	19	9 ± 6	20
PTF-H001-H1-M-033	N/A	N/A	20 ± 9	19	10 ± 6	20
PTF-H001-H1-M-034	N/A	N/A	22 ± 9	19	8 ± 6	20
PTF-H001-H1-M-035	N/A	N/A	27 ± 10	19	9 ± 6	20

Note: All total activity results reported in dpm/100cm^2, all removable activity results reported in gross cpm/100cm^2.

Building Systems Final Status Survey Results

Building PTF Survey Unit H001 Class: N/A

Location Code	Total Beta Activity Measurements		Removable Activity Measurements			
			Tritium		Carbon-14	
	Activty	MDC	Activity	MDC	Activity	MDC
PTF-H001-H1-M-036	N/A	N/A	18 ± 8	19	12 ± 7	20
PTF-H001-H1-M-037	N/A	N/A	22 ± 9	19	7 ± 5	20
PTF-H001-H1-M-038	N/A	N/A	12 ± 7	19	19 ± 9	20
PTF-H001-H1-M-039	N/A	N/A	12 ± 7	19	14 ± 7	20
PTF-H001-H1-M-040	N/A	N/A	17 ± 8	19	8 ± 6	20
PTF-H001-H1-M-041	N/A	N/A	20 ± 9	19	16 ± 8	20
PTF-H001-H1-M-042	N/A	N/A	17 ± 8	19	11 ± 7	20
PTF-H001-H1-M-043	N/A	N/A	19 ± 9	19	13 ± 7	20
PTF-H001-H1-M-044	N/A	N/A	23 ± 9	19	10 ± 6	20
PTF-H001-H1-M-045	N/A	N/A	16 ± 8	19	9 ± 6	20
PTF-H001-H1-M-046	N/A	N/A	20 ± 9	19	11 ± 7	20
PTF-H001-H1-M-047	N/A	N/A	16 ± 8	19	11 ± 7	20
PTF-H001-H1-M-048	N/A	N/A	13 ± 7	19	12 ± 7	20
PTF-H001-H1-M-049	N/A	N/A	16 ± 8	19	18 ± 8	20
PTF-H001-H1-M-050	N/A	N/A	14 ± 7	19	10 ± 6	20
PTF-H001-H1-M-051	N/A	N/A	21 ± 9	19	10 ± 6	20
PTF-H001-H1-M-052	N/A	N/A	29 ± 11	19	13 ± 7	20
PTF-H001-H1-M-053	N/A	N/A	21 ± 9	19	12 ± 7	20
PTF-H001-H1-M-054	N/A	N/A	20 ± 9	19	12 ± 7	20
PTF-H001-H1-M-055	N/A	N/A	16 ± 8	19	8 ± 6	20
PTF-H001-H1-M-056	N/A	N/A	24 ± 10	19	14 ± 7	20
PTF-H001-H1-M-057	N/A	N/A	20 ± 9	19	14 ± 7	20
PTF-H001-H1-M-058	N/A	N/A	10 ± 6	19	9 ± 6	20
PTF-H001-H1-M-059	N/A	N/A	19 ± 9	19	11 ± 7	20
PTF-H001-H1-M-060	N/A	N/A	17 ± 8	19	7 ± 5	20
PTF-H001-H1-M-061	N/A	N/A	12 ± 7	19	11 ± 7	20
PTF-H001-H1-M-062	N/A	N/A	24 ± 10	19	8 ± 6	20
PTF-H001-H1-M-063	N/A	N/A	17 ± 8	19	13 ± 7	20
PTF-H001-H1-M-064	N/A	N/A	15 ± 8	19	13 ± 7	20
PTF-H001-H1-M-065	N/A	N/A	25 ± 10	19	11 ± 7	20
PTF-H001-H1-M-066	N/A	N/A	14 ± 7	19	10 ± 6	20
PTF-H001-H1-M-067	N/A	N/A	16 ± 8	19	15 ± 8	20
PTF-H001-H1-M-068	N/A	N/A	15 ± 8	19	11 ± 7	20
PTF-H001-H1-M-069	N/A	N/A	23 ± 9	19	16 ± 8	20
PTF-H001-H1-M-070	N/A	N/A	13 ± 7	19	7 ± 5	20

Note: All total activity results reported in dpm/100cm^2, all removable activity results reported in gross cpm/100cm^2.

Building Systems Final Status Survey Results

Building PTF Survey Unit H001 Class: N/A

Location Code	Total Beta Activity Measurements		Removable Activity Measurements			
			Tritium		Carbon-14	
	Activty	MDC	Activity	MDC	Activity	MDC
PTF-H001-H1-M-071	N/A	N/A	19 ± 9	19	14 ± 7	20
PTF-H001-H1-M-072	N/A	N/A	16 ± 8	19	12 ± 7	20
PTF-H001-H1-M-073	N/A	N/A	25 ± 10	19	10 ± 6	20
PTF-H001-H1-M-074	N/A	N/A	21 ± 9	19	8 ± 6	20
PTF-H001-H1-M-075	N/A	N/A	21 ± 9	19	19 ± 9	20
PTF-H001-H1-M-076	N/A	N/A	19 ± 9	19	14 ± 7	20
PTF-H001-H1-M-077	N/A	N/A	17 ± 8	19	16 ± 8	20
PTF-H001-H1-M-078	N/A	N/A	18 ± 8	19	17 ± 8	20
PTF-H001-H1-M-079	N/A	N/A	19 ± 9	19	13 ± 7	20
PTF-H001-H1-M-080	N/A	N/A	20 ± 9	19	16 ± 8	20
PTF-H001-H1-M-081	N/A	N/A	22 ± 9	19	7 ± 5	20
PTF-H001-H1-M-082	N/A	N/A	16 ± 8	19	11 ± 7	20
PTF-H001-H1-M-083	N/A	N/A	23 ± 9	19	10 ± 6	20
PTF-H001-H1-M-084	N/A	N/A	23 ± 9	19	11 ± 7	20
PTF-H001-H1-M-085	N/A	N/A	18 ± 8	19	4 ± 4	20
PTF-H001-H1-M-086	N/A	N/A	24 ± 10	19	15 ± 8	20
PTF-H001-H1-M-087	N/A	N/A	11 ± 7	19	12 ± 7	20
PTF-H001-H1-M-088	N/A	N/A	22 ± 9	19	10 ± 6	20
PTF-H001-H1-M-089	N/A	N/A	13 ± 7	19	10 ± 6	20
PTF-H001-H1-M-090	N/A	N/A	28 ± 10	19	12 ± 7	20
PTF-H001-H1-M-091	N/A	N/A	16 ± 8	19	7 ± 5	20
PTF-H001-H1-M-092	N/A	N/A	16 ± 8	19	8 ± 6	20
PTF-H001-H1-M-093	N/A	N/A	20 ± 9	19	11 ± 7	20
PTF-H001-H1-M-094	N/A	N/A	22 ± 9	19	14 ± 7	20
PTF-H001-H1-M-095	N/A	N/A	18 ± 8	19	9 ± 6	20
PTF-H001-H1-M-096	N/A	N/A	15 ± 8	19	9 ± 6	20
PTF-H001-H1-M-097	N/A	N/A	21 ± 9	19	11 ± 7	20
PTF-H001-H1-M-098	N/A	N/A	24 ± 10	19	17 ± 8	20
PTF-H001-H1-M-099	N/A	N/A	18 ± 8	19	8 ± 6	20
PTF-H001-H1-M-100	N/A	N/A	20 ± 9	19	11 ± 7	20
PTF-H001-H1-M-101	N/A	N/A	12 ± 7	19	12 ± 7	20
PTF-H001-H1-M-102	N/A	N/A	20 ± 9	19	11 ± 7	20
PTF-H001-H1-M-103	N/A	N/A	15 ± 8	19	8 ± 6	20
PTF-H001-H1-M-104	N/A	N/A	23 ± 9	19	11 ± 7	20
PTF-H001-H1-M-105	N/A	N/A	25 ± 10	19	10 ± 6	20

Note: All total activity results reported in dpm/100cm^2, all removable activity results reported in gross cpm/100cm^2.

Building Systems Final Status Survey Results

Building PTF Survey Unit H001 Class: N/A

Location Code	Total Beta Activity Measurements		Removable Activity Measurements			
			Tritium		Carbon-14	
	Activty	MDC	Activity	MDC	Activity	MDC
PTF-H001-H1-M-106	N/A	N/A	19 ± 9	19	13 ± 7	20
PTF-H001-H1-M-107	N/A	N/A	14 ± 7	19	11 ± 7	20
PTF-H001-H1-M-108	N/A	N/A	16 ± 8	19	7 ± 5	20
PTF-H001-H1-M-109	N/A	N/A	18 ± 8	19	12 ± 7	20
PTF-H001-H1-M-110	N/A	N/A	24 ± 10	19	12 ± 7	20
PTF-H001-H1-M-111	N/A	N/A	17 ± 8	19	9 ± 6	20
PTF-H001-H1-M-112	N/A	N/A	18 ± 8	19	16 ± 8	20
PTF-H001-H1-M-113	N/A	N/A	10 ± 6	19	7 ± 5	20
PTF-H001-H1-M-114	N/A	N/A	17 ± 8	19	9 ± 6	20
PTF-H001-H1-M-115	N/A	N/A	21 ± 9	19	13 ± 7	20
PTF-H001-H1-M-116	N/A	N/A	15 ± 8	19	11 ± 7	20
PTF-H001-H1-M-117	N/A	N/A	26 ± 10	19	16 ± 8	20
PTF-H001-H1-M-118	N/A	N/A	13 ± 7	19	11 ± 7	20
PTF-H001-H1-M-119	N/A	N/A	12 ± 7	19	11 ± 7	20
PTF-H001-H1-M-120	N/A	N/A	29 ± 11	19	18 ± 8	20
PTF-H001-H1-M-121	N/A	N/A	20 ± 9	19	14 ± 7	20
PTF-H001-H1-M-122	N/A	N/A	18 ± 8	19	15 ± 8	20
PTF-H001-H1-M-123	N/A	N/A	15 ± 8	19	17 ± 8	20
PTF-H001-H1-M-124	N/A	N/A	21 ± 9	19	11 ± 7	20
PTF-H001-H1-M-125	N/A	N/A	13 ± 7	19	14 ± 7	20
PTF-H001-H1-M-126	N/A	N/A	16 ± 8	19	11 ± 7	20
PTF-H001-H1-M-127	N/A	N/A	19 ± 9	19	15 ± 8	20
PTF-H001-H1-M-128	N/A	N/A	15 ± 8	19	18 ± 8	20
PTF-H001-H1-M-129	N/A	N/A	20 ± 9	19	16 ± 8	20
PTF-H001-H1-M-130	N/A	N/A	24 ± 10	19	14 ± 7	20
PTF-H001-H1-M-131	N/A	N/A	30 ± 11	19	8 ± 6	20
PTF-H001-H1-M-132	N/A	N/A	18 ± 8	19	11 ± 7	20
PTF-H001-H1-M-133	N/A	N/A	11 ± 7	19	14 ± 7	20
PTF-H001-H1-M-134	N/A	N/A	15 ± 8	19	20 ± 9	20
PTF-H001-H1-M-135	N/A	N/A	17 ± 8	19	10 ± 6	20
PTF-H001-H1-M-136	N/A	N/A	25 ± 10	19	12 ± 7	20
PTF-H001-H1-M-137	N/A	N/A	12 ± 7	19	10 ± 6	20
PTF-H001-H1-M-138	N/A	N/A	21 ± 9	19	15 ± 8	20
PTF-H001-H1-M-139	N/A	N/A	17 ± 8	19	17 ± 8	20
PTF-H001-H1-M-140	N/A	N/A	16 ± 8	19	11 ± 7	20

Note: All total activity results reported in dpm/100cm^2, all removable activity results reported in gross cpm/100cm^2.

Building Systems Final Status Survey Results

Building PTF — Survey Unit H001 — Class: N/A

Location Code	Total Beta Activity Measurements		Removable Activity Measurements			
			Tritium		Carbon-14	
	Activty	MDC	Activity	MDC	Activity	MDC
PTF-H001-H1-M-141	N/A	N/A	19 ± 9	19	14 ± 7	20
PTF-H001-H1-M-142	N/A	N/A	18 ± 8	19	8 ± 6	20
PTF-H001-H1-M-143	N/A	N/A	15 ± 8	19	11 ± 7	20
PTF-H001-H1-M-144	N/A	N/A	22 ± 9	19	14 ± 7	20
PTF-H001-H1-M-145	N/A	N/A	10 ± 6	19	9 ± 6	20
PTF-H001-H1-M-146	N/A	N/A	28 ± 10	19	9 ± 6	20
PTF-H001-H1-M-147	N/A	N/A	16 ± 8	19	9 ± 6	20
PTF-H001-H1-M-148	N/A	N/A	23 ± 9	19	8 ± 6	20
PTF-H001-H1-M-149	N/A	N/A	17 ± 8	19	14 ± 7	20
PTF-H001-H1-M-150	N/A	N/A	15 ± 8	19	14 ± 7	20
PTF-H001-H1-M-151	N/A	N/A	15 ± 8	19	10 ± 6	20
PTF-H001-H1-M-152	N/A	N/A	11 ± 7	19	6 ± 5	20
PTF-H001-H1-M-153	N/A	N/A	17 ± 8	19	10 ± 6	20
PTF-H001-H1-M-154	N/A	N/A	22 ± 9	19	8 ± 6	20
PTF-H001-H1-M-155	N/A	N/A	13 ± 7	19	7 ± 5	20
PTF-H001-H1-M-156	N/A	N/A	15 ± 8	19	17 ± 8	20
PTF-H001-H1-M-157	N/A	N/A	15 ± 8	19	17 ± 8	20
PTF-H001-H1-M-158	N/A	N/A	23 ± 9	19	7 ± 5	20
PTF-H001-H1-M-159	N/A	N/A	21 ± 9	19	10 ± 6	20
PTF-H001-H1-M-160	N/A	N/A	29 ± 11	19	7 ± 5	20
PTF-H001-H1-M-161	N/A	N/A	15 ± 8	19	6 ± 5	20
PTF-H001-H1-M-162	N/A	N/A	30 ± 11	19	10 ± 6	20
PTF-H001-H1-M-163	N/A	N/A	21 ± 9	19	23 ± 9	20
PTF-H001-H1-M-164	N/A	N/A	19 ± 9	19	6 ± 5	20
PTF-H001-H1-M-165	N/A	N/A	19 ± 9	19	10 ± 6	20
PTF-H001-H1-M-166	N/A	N/A	19 ± 9	19	11 ± 7	20
PTF-H001-H1-M-167	N/A	N/A	21 ± 9	19	13 ± 7	20
PTF-H001-H1-M-168	N/A	N/A	24 ± 10	19	17 ± 8	20
PTF-H001-H1-M-169	N/A	N/A	21 ± 9	19	13 ± 7	20
PTF-H001-H1-M-170	N/A	N/A	23 ± 9	19	13 ± 7	20
PTF-H001-H1-M-171	N/A	N/A	15 ± 8	19	15 ± 8	20
PTF-H001-H1-M-172	N/A	N/A	17 ± 8	19	6 ± 5	20
PTF-H001-H1-M-173	N/A	N/A	22 ± 9	19	12 ± 7	20
PTF-H001-H1-M-174	N/A	N/A	20 ± 9	19	16 ± 8	20
PTF-H001-H1-M-175	N/A	N/A	11 ± 7	19	11 ● 7	20

Note: All total activity results reported in dpm/100cm^2, all removable activity results reported in gross cpm/100cm^2.

Building Systems Final Status Survey Results

Building PTF Survey Unit H001 Class: N/A

Location Code	Total Beta Activity Measurements		Removable Activity Measurements			
			Tritium		Carbon-14	
	Activty	MDC	Activity	MDC	Activity	MDC
PTF-H001-H1-M-176	N/A	N/A	21 ± 9	19	14 ± 7	20
PTF-H001-H1-M-177	N/A	N/A	23 ± 9	19	12 ± 7	20
PTF-H001-H1-M-178	N/A	N/A	23 ± 9	19	7 ± 5	20
PTF-H001-H1-M-179	N/A	N/A	18 ± 8	19	13 ± 7	20
PTF-H001-H1-M-180	N/A	N/A	15 ± 8	19	5 ± 4	20
PTF-H001-H1-M-181	N/A	N/A	16 ± 8	19	11 ● 7	20
PTF-H001-H1-M-182	N/A	N/A	18 ± 8	19	9 ± 6	20
PTF-H001-H1-M-183	N/A	N/A	18 ± 8	19	17 ± 8	20
PTF-H001-H1-M-184	N/A	N/A	23 ± 9	19	12 ± 7	20
PTF-H001-H1-M-185	N/A	N/A	12 ± 7	19	15 ± 8	20
PTF-H001-H1-M-186	N/A	N/A	32 ± 11	19	6 ± 5	20
PTF-H001-H1-M-187	N/A	N/A	18 ± 8	19	8 ± 6	20
PTF-H001-H1-M-188	N/A	N/A	24 ± 10	19	8 ± 6	20
PTF-H001-H1-M-189	N/A	N/A	19 ± 9	19	16 ± 8	20
PTF-H001-H1-M-190	N/A	N/A	21 ± 9	19	14 ± 7	20
PTF-H001-H1-M-191	N/A	N/A	24 ± 10	19	14 ± 7	20
PTF-H001-H1-M-192	N/A	N/A	24 ± 10	19	13 ± 7	20
PTF-H001-H1-M-193	N/A	N/A	28 ± 10	19	9 ± 6	20
PTF-H001-H1-M-194	N/A	N/A	17 ± 8	19	12 ± 7	20
PTF-H001-H1-M-195	N/A	N/A	13 ± 7	19	15 ± 8	20
PTF-H001-H1-M-196	N/A	N/A	23 ± 9	19	11 ± 7	20
PTF-H001-H1-M-197	N/A	N/A	16 ± 8	19	14 ± 7	20
PTF-H001-H1-M-198	N/A	N/A	17 ± 8	19	7 ± 5	20
PTF-H001-H1-M-199	N/A	N/A	12 ± 7	19	13 ± 7	20
PTF-H001-H1-M-200	N/A	N/A	22 ± 9	19	10 ± 6	20
PTF-H001-H1-M-201	N/A	N/A	23 ± 9	19	9 ± 6	20
PTF-H001-H1-M-202	N/A	N/A	21 ± 9	19	11 ± 7	20
PTF-H001-H1-M-203	N/A	N/A	12 ± 7	19	9 ± 6	20
PTF-H001-H1-M-204	N/A	N/A	15 ± 8	19	9 ± 6	20
PTF-H001-H1-M-205	N/A	N/A	17 ± 8	19	10 ± 6	20
PTF-H001-H1-M-206	N/A	N/A	21 ± 9	19	15 ± 8	20
PTF-H001-H1-M-207	N/A	N/A	23 ± 9	19	13 ± 7	20
PTF-H001-H1-M-208	N/A	N/A	23 ± 9	19	12 ± 7	20
PTF-H001-H1-M-209	N/A	N/A	11 ± 7	19	13 ± 7	20
PTF-H001-H1-M-210	N/A	N/A	22 ± 9	19	10 ± 6	20

Note: All total activity results reported in dpm/100cm^2, all removable activity results reported in gross cpm/100cm^2.

Building Systems Final Status Survey Results

Building PTF Survey Unit H001 Class: N/A

Location Code	Total Beta Activity Measurements		Removable Activity Measurements			
			Tritium		Carbon-14	
	Activty	MDC	Activity	MDC	Activity	MDC
PTF-H001-H1-M-211	N/A	N/A	14 ± 7	19	6 ± 5	20
PTF-H001-H1-M-212	N/A	N/A	18 ± 8	19	8 ± 6	20
PTF-H001-H1-M-213	N/A	N/A	21 ± 9	19	8 ± 6	20
PTF-H001-H1-M-214	N/A	N/A	19 ± 9	19	10 ± 6	20
PTF-H001-H1-M-215	N/A	N/A	18 ± 8	19	7 ± 5	20
PTF-H001-H1-M-216	N/A	N/A	14 ± 7	19	11 ± 7	20
PTF-H001-H1-M-217	N/A	N/A	16 ± 8	19	12 ± 7	20
PTF-H001-H1-M-218	N/A	N/A	21 ± 9	19	7 ± 5	20
PTF-H001-H1-M-219	N/A	N/A	19 ± 9	19	23 ± 9	20
PTF-H001-H1-M-220	N/A	N/A	21 ± 9	19	12 ± 7	20
PTF-H001-H1-M-221	N/A	N/A	17 ± 8	19	11 ± 7	20
PTF-H001-H1-M-222	N/A	N/A	15 ± 8	19	17 ± 8	20
PTF-H001-H1-M-223	N/A	N/A	18 ± 8	19	8 ± 6	20
PTF-H001-H1-M-224	N/A	N/A	20 ± 9	19	10 ± 6	20
PTF-H001-H1-M-225	N/A	N/A	24 ± 10	19	12 ● 7	20
PTF-H001-H1-M-226	N/A	N/A	14 ± 7	19	12 ± 7	20
PTF-H001-H1-M-227	N/A	N/A	25 ± 10	19	13 ± 7	20
PTF-H001-H1-M-228	N/A	N/A	23 ± 9	19	12 ± 7	20
PTF-H001-H1-M-229	N/A	N/A	16 ± 8	19	6 ± 5	20
PTF-H001-H1-M-230	N/A	N/A	19 ± 9	19	10 ± 6	20
PTF-H001-H1-M-231	N/A	N/A	20 ± 9	19	17 ± 8	20
PTF-H001-H1-M-232	N/A	N/A	18 ± 8	19	12 ± 7	20
PTF-H001-H1-M-233	N/A	N/A	14 ± 7	19	12 ± 7	20
PTF-H001-H1-M-234	N/A	N/A	22 ± 9	19	12 ± 7	20
PTF-H001-H1-M-235	N/A	N/A	21 ± 9	19	10 ± 6	20
PTF-H001-H1-M-236	N/A	N/A	16 ± 8	19	15 ± 8	20
PTF-H001-H1-M-237	N/A	N/A	34 ± 11	19	15 ± 8	20
PTF-H001-H1-M-238	N/A	N/A	25 ± 10	19	9 ± 6	20
PTF-H001-H1-M-239	N/A	N/A	19 ± 9	19	11 ± 7	20
PTF-H001-H1-M-240	N/A	N/A	95 ± 19	19	10 ● 6	20
PTF-H001-H1-M-241	N/A	N/A	13 ± 7	19	10 ± 6	20
PTF-H001-H1-M-242	N/A	N/A	26 ± 10	19	12 ± 7	20
PTF-H001-H1-M-243	N/A	N/A	23 ± 9	19	11 ± 7	20
PTF-H001-H1-M-244	N/A	N/A	18 ± 8	19	8 ± 6	20
PTF-H001-H1-M-245	N/A	N/A	14 ± 7	19	7 ± 5	20

Note: All total activity results reported in dpm/100cm^2, all removable activity results reported in gross cpm/100cm^2.

Building Systems Final Status Survey Results

Building PTF Survey Unit H001 Class: N/A

Location Code	Total Beta Activity Measurements		Removable Activity Measurements			
			Tritium		Carbon-14	
	Activty	MDC	Activity	MDC	Activity	MDC
PTF-H001-H2-M-246	N/A	N/A	17 ± 8	19	11 ± 7	20
PTF-H001-H2-M-247	N/A	N/A	20 ± 9	19	18 ± 8	20
PTF-H001-H2-M-248	N/A	N/A	21 ± 9	19	8 ± 6	20
PTF-H001-H2-M-249	N/A	N/A	21 ± 9	19	18 ± 8	20
PTF-H001-H2-M-250	N/A	N/A	28 ± 10	19	12 ± 7	20
PTF-H001-H2-M-251	N/A	N/A	33 ± 11	19	9 ± 6	20
PTF-H001-H2-M-252	N/A	N/A	20 ± 9	19	10 ± 6	20
PTF-H001-H2-M-253	N/A	N/A	22 ± 9	19	8 ± 6	20
Summary for Survey Unit # H001 (253 detail records)						
Average			20		12	
Minimum			10		4	
Maximum			95		23	
Standard Deviation			8		3	

Note: All total activity results reported in dpm/100cm^2, all removable activity results reported in gross cpm/100cm^2.

Building Systems Final Status Survey Results

Building PTF Survey Unit V001 Class: N/A

Location Code	Total Beta Activity Measurements		Removable Activity Measurements			
			Tritium		Carbon-14	
	Activty	MDC	Activity	MDC	Activity	MDC
PTF-V001-V1-M-001	N/A	N/A	26 ± 10	19	19 ± 9	20
PTF-V001-V1-M-002	N/A	N/A	16 ± 8	19	10 ± 6	20
PTF-V001-V1-M-003	N/A	N/A	27 ± 10	19	11 ± 7	20
PTF-V001-V1-M-004	N/A	N/A	10 ± 6	19	14 ± 7	20
PTF-V001-V1-M-005	N/A	N/A	14 ± 7	19	11 ± 7	20
PTF-V001-V1-M-006	N/A	N/A	25 ± 10	19	16 ± 8	20
PTF-V001-V1-M-007	N/A	N/A	17 ± 8	19	8 ± 6	20
PTF-V001-V1-M-008	N/A	N/A	20 ± 9	19	11 ± 7	20
PTF-V001-V1-M-009	N/A	N/A	24 ± 10	19	12 ± 7	20
PTF-V001-V1-M-010	N/A	N/A	21 ± 9	19	8 ± 6	20
PTF-V001-V1-M-011	N/A	N/A	10 ± 6	19	12 ± 7	20
PTF-V001-V1-M-012	N/A	N/A	15 ± 8	19	10 ± 6	20
PTF-V001-V1-M-013	N/A	N/A	28 ± 10	19	9 ± 6	20
PTF-V001-V1-M-014	N/A	N/A	28 ± 10	19	17 ± 8	20
PTF-V001-V1-M-015	N/A	N/A	18 ± 8	19	12 ± 7	20
PTF-V001-V1-M-016	N/A	N/A	16 ± 8	19	12 ± 7	20
PTF-V001-V1-M-017	N/A	N/A	9 ± 6	19	6 ± 5	20
PTF-V001-V1-M-018	N/A	N/A	17 ± 8	19	16 ± 8	20
PTF-V001-V1-M-019	N/A	N/A	19 ± 9	19	18 ± 8	20
PTF-V001-V1-M-020	N/A	N/A	21 ± 9	19	11 ± 7	20
PTF-V001-V1-M-021	N/A	N/A	23 ± 9	19	11 ± 7	20
PTF-V001-V1-M-022	N/A	N/A	21 ± 9	19	10 ± 6	20
PTF-V001-V1-M-023	N/A	N/A	15 ± 8	19	13 ± 7	20
PTF-V001-V1-M-024	N/A	N/A	19 ± 9	19	12 ± 7	20
PTF-V001-V1-M-025	N/A	N/A	12 ± 7	19	6 ± 5	20
PTF-V001-V1-M-026	N/A	N/A	14 ± 7	19	16 ± 8	20
PTF-V001-V1-M-027	N/A	N/A	35 ± 12	19	15 ± 8	20
PTF-V001-V1-M-028	N/A	N/A	18 ± 8	19	11 ± 7	20
PTF-V001-V1-M-029	N/A	N/A	16 ± 8	19	13 ± 7	20
PTF-V001-V1-M-030	N/A	N/A	20 ± 9	19	13 ± 7	20
PTF-V001-V1-M-031	N/A	N/A	17 ± 8	19	10 ± 6	20
PTF-V001-V1-M-032	N/A	N/A	15 ± 8	19	15 ± 8	20
PTF-V001-V1-M-033	N/A	N/A	17 ± 8	19	10 ± 6	20
PTF-V001-V1-M-034	N/A	N/A	21 ± 9	19	6 ± 5	20
PTF-V001-V1-M-035	N/A	N/A	21 ± 9	19	7 ± 5	20

Note: All total activity results reported in dpm/100cm^2, all removable activity results reported in gross cpm/100cm^2.

Building Systems Final Status Survey Results

Building PTF Survey Unit V001 Class: N/A

Location Code	Total Beta Activity Measurements		Removable Activity Measurements			
			Tritium		Carbon-14	
	Activty	MDC	Activity	MDC	Activity	MDC
PTF-V001-V1-M-036	N/A	N/A	17 ± 8	19	6 ± 5	20
PTF-V001-V1-M-037	N/A	N/A	24 ± 10	19	7 ± 5	20
PTF-V001-V1-M-038	N/A	N/A	20 ± 9	19	16 ± 8	20
PTF-V001-V1-M-039	N/A	N/A	12 ± 7	19	15 ± 8	20
PTF-V001-V1-M-040	N/A	N/A	21 ± 9	19	11 ± 7	20
PTF-V001-V1-M-041	N/A	N/A	18 ± 8	19	8 ± 6	20
PTF-V001-V1-M-042	N/A	N/A	19 ± 9	19	15 ± 8	20
PTF-V001-V1-M-043	N/A	N/A	19 ± 9	19	9 ± 6	20
PTF-V001-V1-M-044	N/A	N/A	19 ± 9	19	21 ± 9	20
PTF-V001-V1-M-045	N/A	N/A	15 ± 8	19	9 ± 6	20
PTF-V001-V1-M-046	N/A	N/A	18 ± 8	19	16 ± 8	20
PTF-V001-V1-M-047	N/A	N/A	16 ± 8	19	14 ± 7	20
PTF-V001-V1-M-048	N/A	N/A	30 ± 11	19	7 ± 5	20
PTF-V001-V1-M-049	N/A	N/A	13 ± 7	19	16 ± 8	20
PTF-V001-V1-M-050	N/A	N/A	13 ± 7	19	8 ± 6	20
PTF-V001-V1-M-051	N/A	N/A	15 ± 8	19	8 ± 6	20
PTF-V001-V1-M-052	N/A	N/A	19 ± 9	19	9 ± 6	20
PTF-V001-V1-M-053	N/A	N/A	21 ± 9	19	13 ± 7	20
PTF-V001-V1-M-054	N/A	N/A	28 ± 10	19	20 ± 9	20
PTF-V001-V1-M-055	N/A	N/A	27 ± 10	19	9 ± 6	20
PTF-V001-V1-M-056	N/A	N/A	18 ± 8	19	12 ± 7	20
PTF-V001-V1-M-057	N/A	N/A	14 ± 7	19	11 ± 7	20
PTF-V001-V1-M-058	N/A	N/A	15 ± 8	19	9 ± 6	20
PTF-V001-V1-M-059	N/A	N/A	18 ± 8	19	10 ± 6	20
PTF-V001-V1-M-060	N/A	N/A	15 ± 8	19	8 ± 6	20
PTF-V001-V1-M-061	N/A	N/A	15 ± 8	19	7 ± 5	20
PTF-V001-V1-M-062	N/A	N/A	25 ± 10	19	15 ± 8	20
PTF-V001-V1-M-063	N/A	N/A	25 ± 10	19	14 ± 7	20
PTF-V001-V1-M-064	N/A	N/A	28 ± 10	19	9 ± 6	20
PTF-V001-V1-M-065	N/A	N/A	21 ± 9	19	10 ± 6	20
PTF-V001-V1-M-066	N/A	N/A	10 ± 6	19	13 ± 7	20
PTF-V001-V1-M-067	N/A	N/A	22 ± 9	19	12 ± 7	20
PTF-V001-V1-M-068	N/A	N/A	14 ± 7	19	9 ± 6	20
PTF-V001-V1-M-069	N/A	N/A	14 ± 7	19	12 ± 7	20
PTF-V001-V1-M-070	N/A	N/A	20 ± 9	19	13 ± 7	20

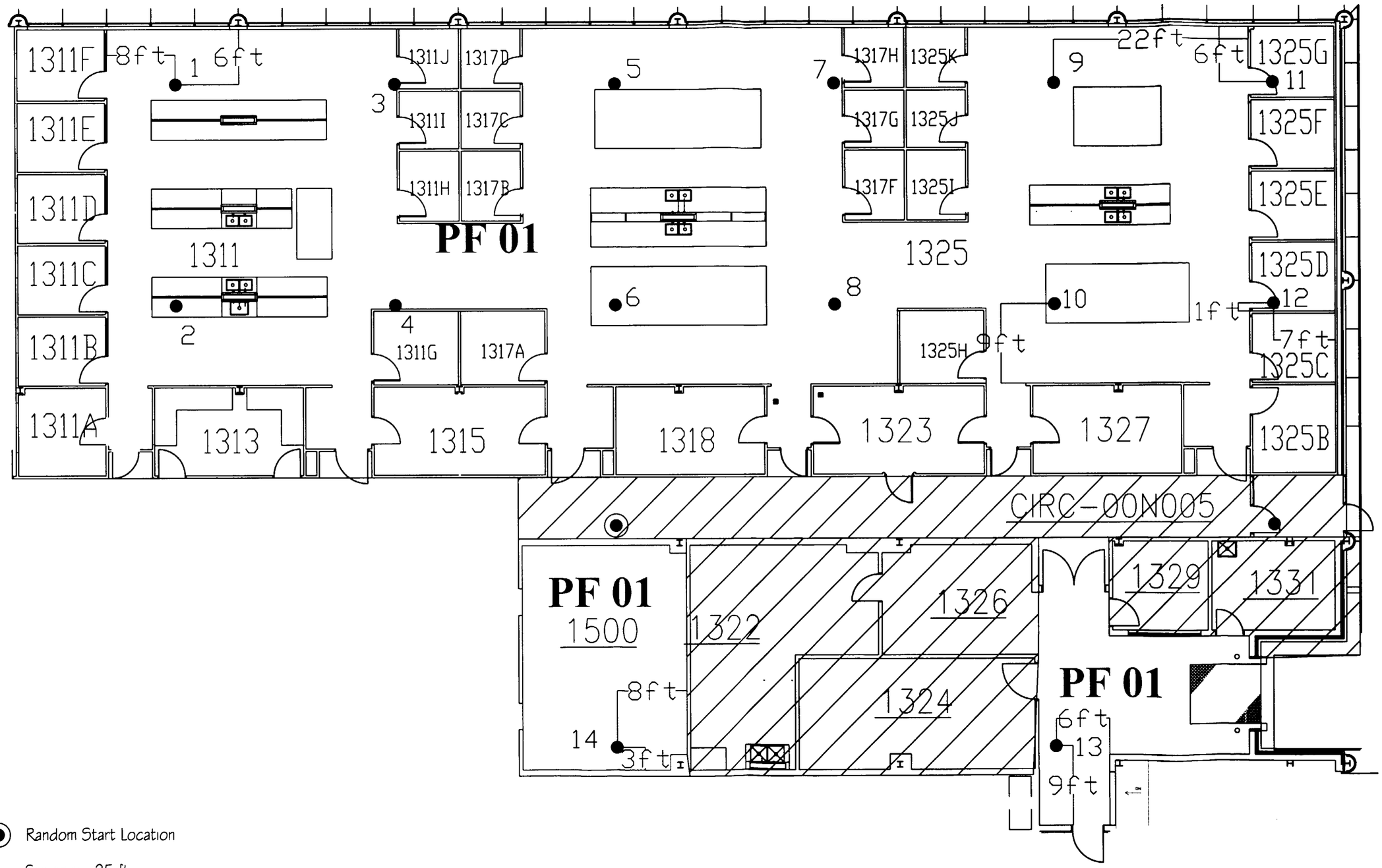
Note: All total activity results reported in dpm/100cm^2, all removable activity results reported in gross cpm/100cm^2.

Building Systems Final Status Survey Results

Building PTF Survey Unit V001 Class: N/A

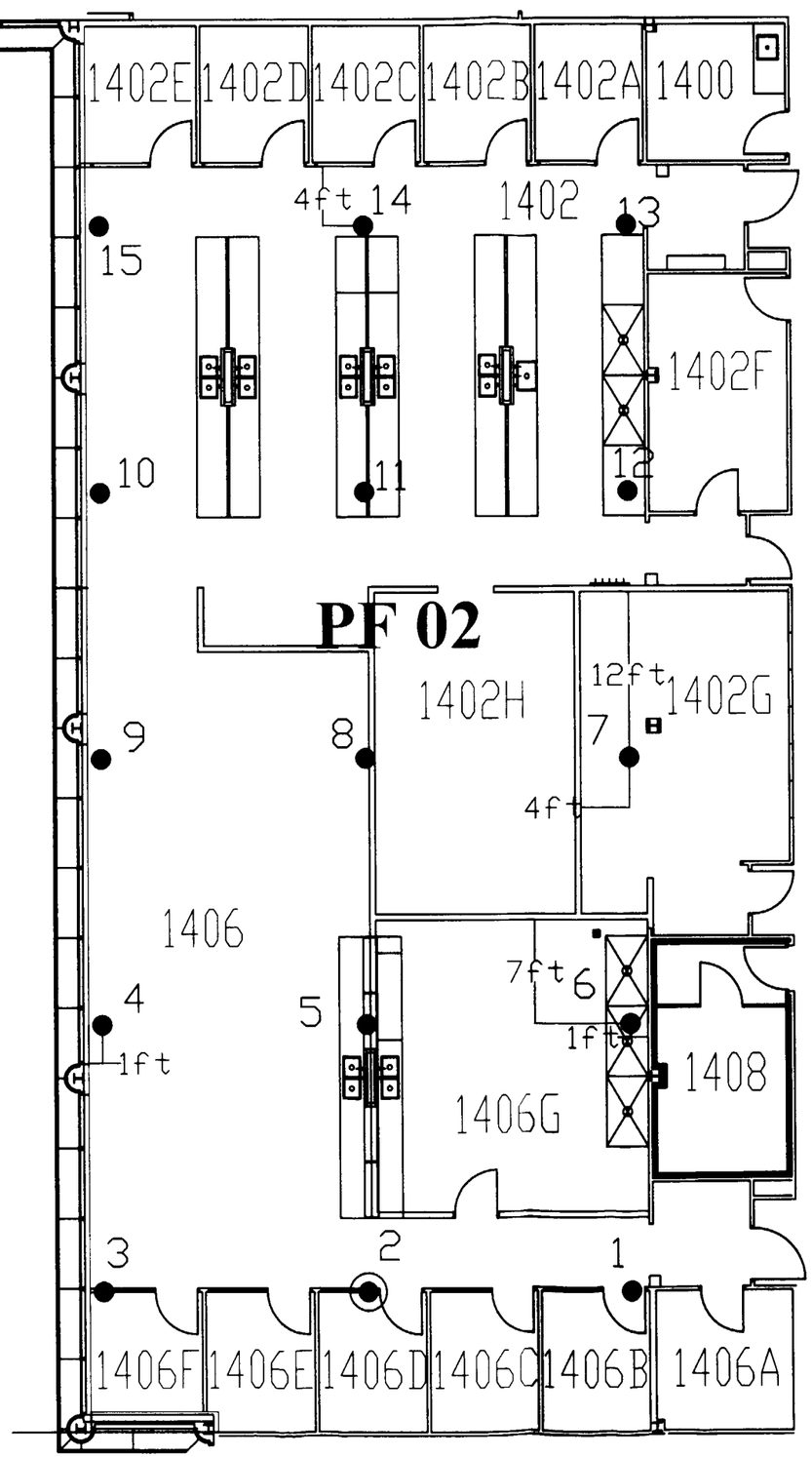
Location Code	Total Beta Activity Measurements		Removable Activity Measurements			
			Tritium		Carbon-14	
	Activty	MDC	Activity	MDC	Activity	MDC
PTF-V001-V1-M-071	N/A	N/A	17 ± 8	19	11 ± 7	20
PTF-V001-V1-M-072	N/A	N/A	17 ± 8	19	12 ± 7	20
PTF-V001-V1-M-073	N/A	N/A	18 ± 8	19	17 ± 8	20
PTF-V001-V1-M-074	N/A	N/A	25 ± 10	19	10 ± 6	20
PTF-V001-V1-M-075	N/A	N/A	16 ± 8	19	6 ± 5	20
PTF-V001-V1-M-076	N/A	N/A	14 ± 7	19	7 ± 5	20
PTF-V001-V1-M-077	N/A	N/A	22 ± 9	19	15 ± 8	20
PTF-V001-V1-M-078	N/A	N/A	18 ± 8	19	9 ± 6	20
PTF-V001-V2-M-079	N/A	N/A	11 ± 7	19	10 ± 6	20
PTF-V001-V2-M-080	N/A	N/A	8 ± 6	19	11 ± 7	20
Summary for Survey Unit # V001 (80 detail records)						
Average			19		12	
Minimum			8		6	
Maximum			35		21	
Standard Deviation			5		3	
Summary for Building # PTF (453 detail records)						
Avg			19		12	
Min			8		2	
Max			95		23	

Note: All total activity results reported in dpm/100cm^2, all removable activity results reported in gross cpm/100cm^2.



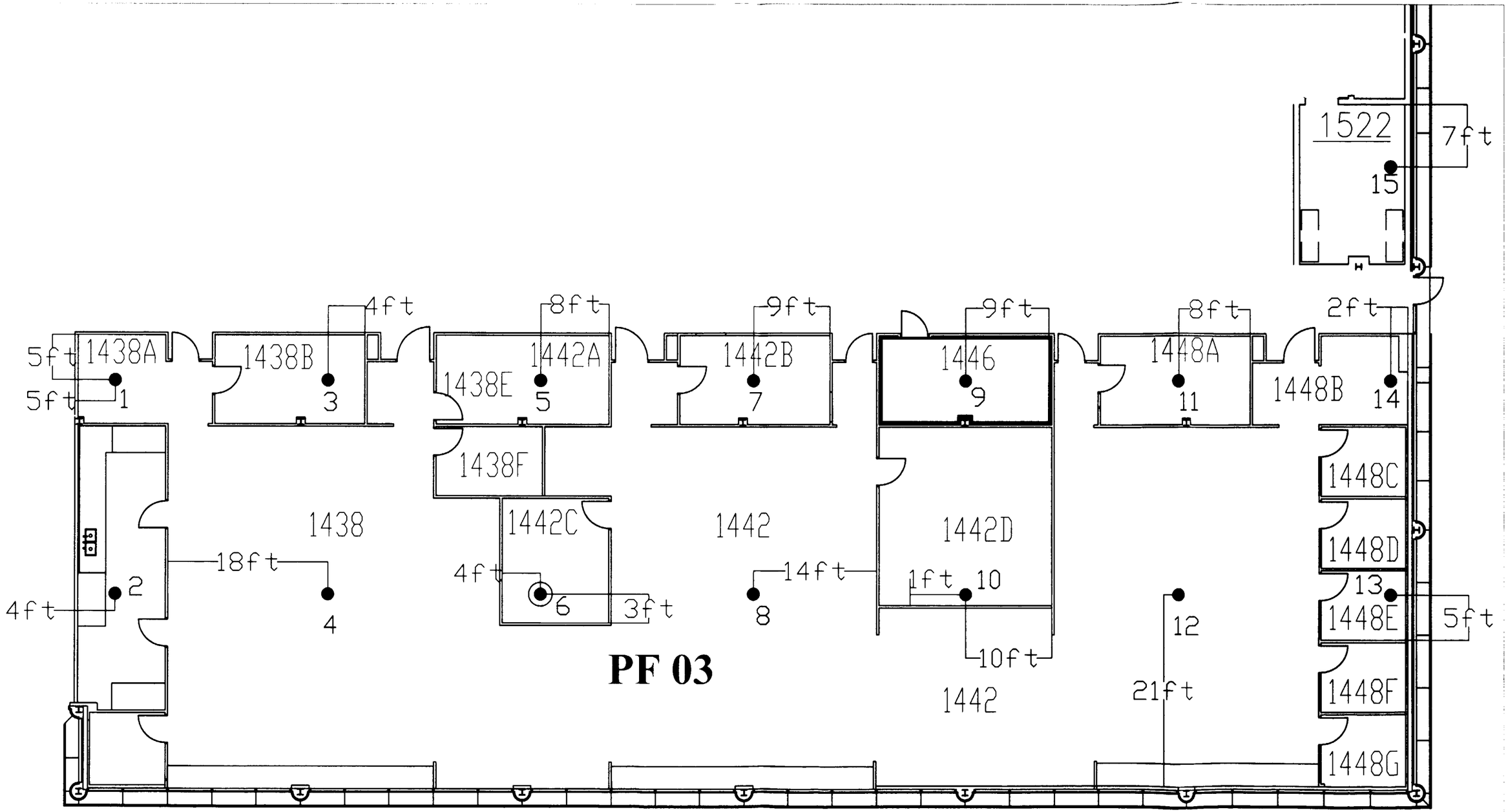
Random Start Location

Spacing= 25 ft



Random Start Location

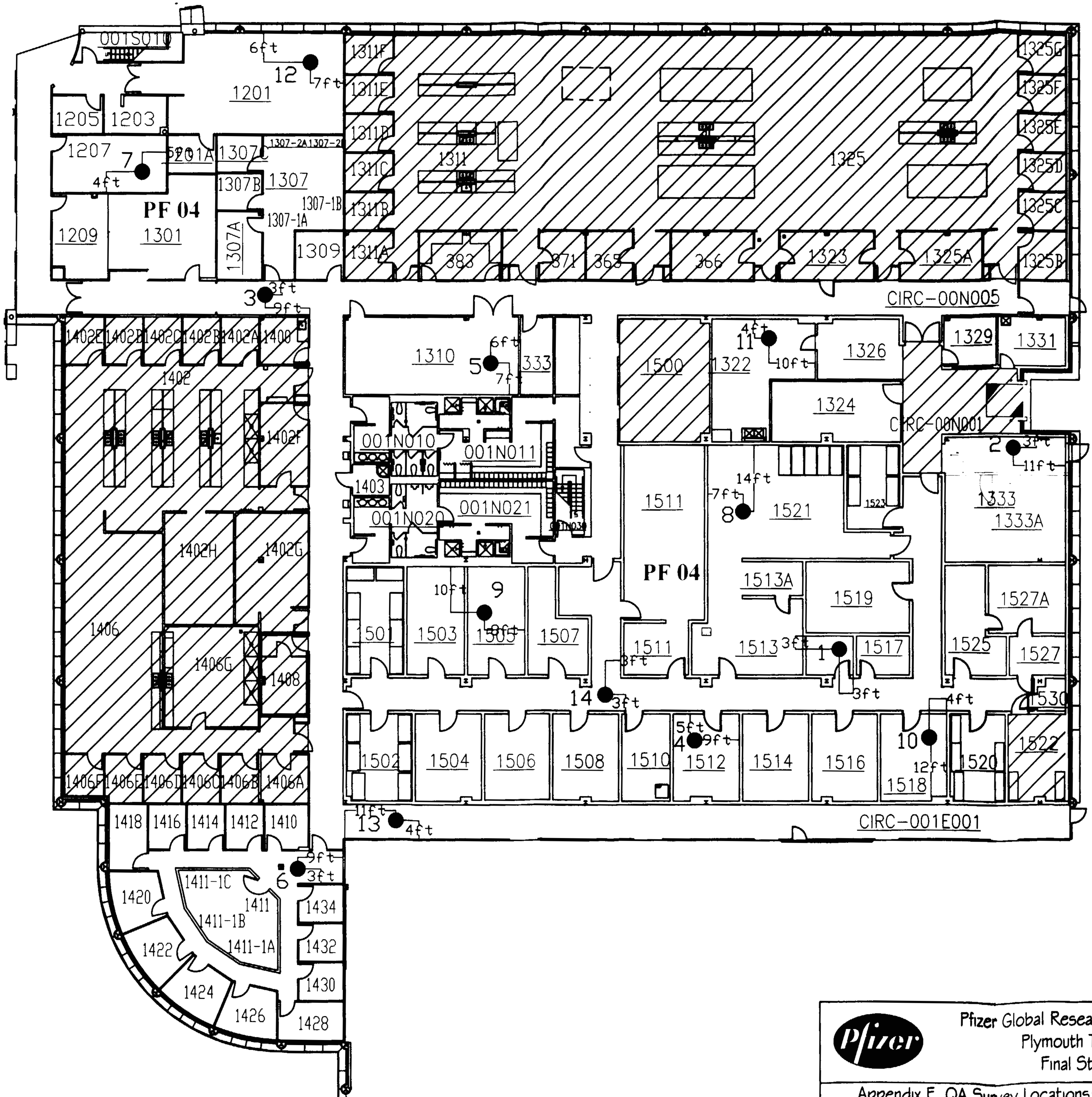
Spacing= 19ft



PF 03

Random Start Location

Spacing= 24 ft



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Pfizer

Pfizer Global Research and Development
Plymouth Township Facility
Final Status Report

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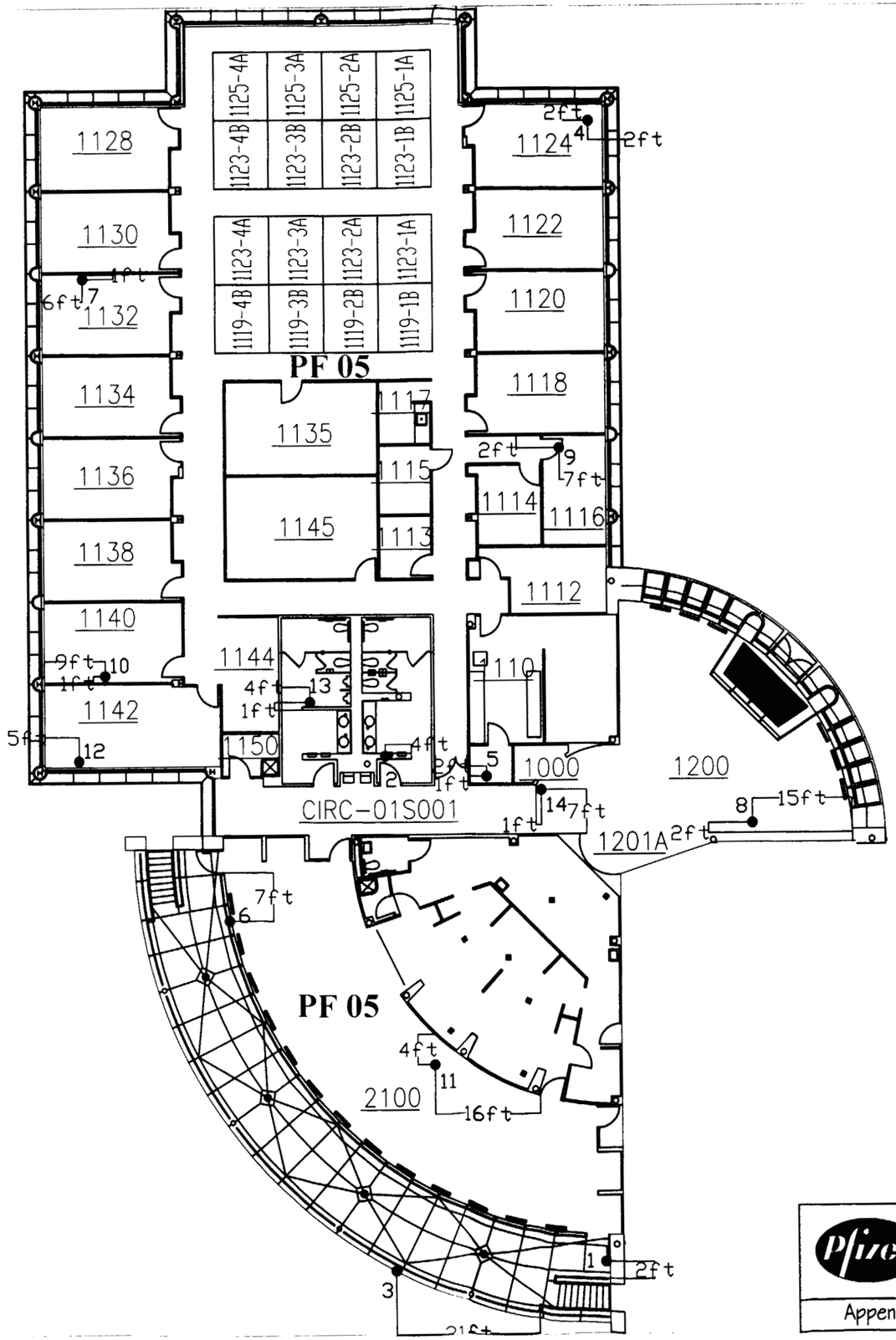
Appendix F, QA Survey Locations: PF04

Page: F.4 of F.5



● Sample Location

Pfizer Global Research and Development
Plymouth Township Facility
QA Survey Package

Building: PTF	Survey Unit: PF01	Page 1 of ____

Classification:	☐ Class 1	☒ Class 2	☐ Class 3	☐ System

Nuclides of Concern:	☒ ^{3}H	☒ ^{14}C			
$DCGL_W$ (dpm/100cm²)	1.2E8	3.7E6			
Investigation Level – Total Surface Activity (dpm/100cm²)	N/A	5,000			
Investigation Level – Removable Surface Activity (dpm/100cm²)	200	200			

	Required Instrumentation	Measurement Type	Static Count Time	Maximum Scan Rate (inches/sec.)	Based on:	Typical Static *MDCR*
☐	SRA LabRATS	Beta	5 sec.	7.8	^{14}C	555 cpm
☒	Ludlum 43-68	Beta	6 sec. 60 sec. bkg.	5	^{14}C	217 cpm
☐	Ludlum 43-37 Floor Monitor	Beta	10 sec. 60 sec. bkg.	5	^{14}C	50 cpm
☐	Other: _____ (Specify)					
☒	A Liquid Scintillation Counter shall be used for analysis of any required removable contamination measurements.					

Pfizer Global Research and Development
Plymouth Township Facility
QA Survey Package

Building: PTF	Survey Unit: PF01	Page 2 of ____

General Survey Instructions:

1. The calculated number of static measurement locations needed for the statistical evaluation of this survey unit is **14**. For Class 1 survey units, these locations are selected on horizontal and vertical surfaces. For Class 2 and Class 3 survey units, these locations are selected on horizontal surfaces only.

2. For Class 1 and 2 survey units, the locations are determined by using a random start point and a systematic spacing from this point. For Class 3 survey units, these locations are selected by using randomly generated coordinates to determine sample locations. Due to this method, the actual number of locations may vary. In this case, collect the actual locations provided on the survey map whether this number is greater than or less than 14.

3. Locate and mark the required static measurements locations using the provided survey map(s). Survey Maps have been provided with the required static measurement locations. Sufficient detail has been provided on these maps to determine all of these locations.

4. Collect a static measurement and LSC smear at each sample location. Document the results on the associated data results sheets.

5. Notify the Project Manager if any total or removable contamination measurement exceeds the applicable investigation level.

Survey Unit Classification	Flag Direct Measurement or Sample Result When:	Flag Beta Scanning Measurement Result When:	Flag Removable Measurement Result When:
All	> 5,000 dpm/100 cm^2	> 5,000 dpm/100 cm^2	> 200 dpm/100 cm^2 in any channel

6. Ensure that all package information is completed and signed prior to turning in this Survey Package to the Project Manager for review.

Special Survey Instructions:

Building: PTF	Survey Unit: PF01	Page 3 of ____

Location Code Description

A unique location code shall be assigned to each individual survey location to ensure proper data management of the survey results. The following format shall be used to ensure consistency throughout the final status survey process:

BBB-RRRR-SS-M-LLL

Where:

BBB	=	Building code. This field represents the facility. This will be the building number or an assigned area number. (3 characters) Plymouth Township Facility = PTF
RRRR	=	Survey unit number. (4 characters)
SS	=	Structural surface code. This field represents the structural surface such as floor, wall, ceiling, etc. (2 characters) F1 = Floor B1 = Benchtop S2 = Other Structures
M	=	Structural material code. This field represents the type of structural material on which a particular measurement is taken. This field is used to for data sorting and analysis. The Project Manager will provide applicable codes that will be developed during characterization. The default character shall be "M". (1 Character)
LLL	=	Numerical identification number. This field represents the survey location number. The field "001" means survey point location number 1. Numerical identifiers shall not be duplicated within the same survey unit. (3-characters)

Building: PTF	**Survey Unit: PF01**	**Page 4 of ___**

Survey Data

Inst. #1	Inst Type:	Inst. S/N	Cal Due Date:	MDCR:	BKG (cpm)
	Probe Type:	Probe S/N	Inst Eff:	Count Time:	
Inst. #2	Inst Type:	Inst. S/N	Cal Due Date:	MDCR:	BKG (cpm)
	Probe Type:	Probe S/N	Inst Eff:	Count Time:	
Inst. #3	Inst Type:	Inst. S/N	Cal Due Date:	MDCR:	BKG (cpm)
	Probe Type:	Probe S/N	Inst Eff:	Count Time:	

Location Code (BBB-RRRR-SS-M-LLL)	Static Measurement Survey Results			Smear Results		
				Net Activity (dpm/100cm^2)		
	Gross Counts (cpm/probe)	Net Counts (cpm/probe)	Net Activity (dpm/100cm^2)	CH 1	CH 2	CH 3
___-____-__-_-___						
___-____-__-_-___						
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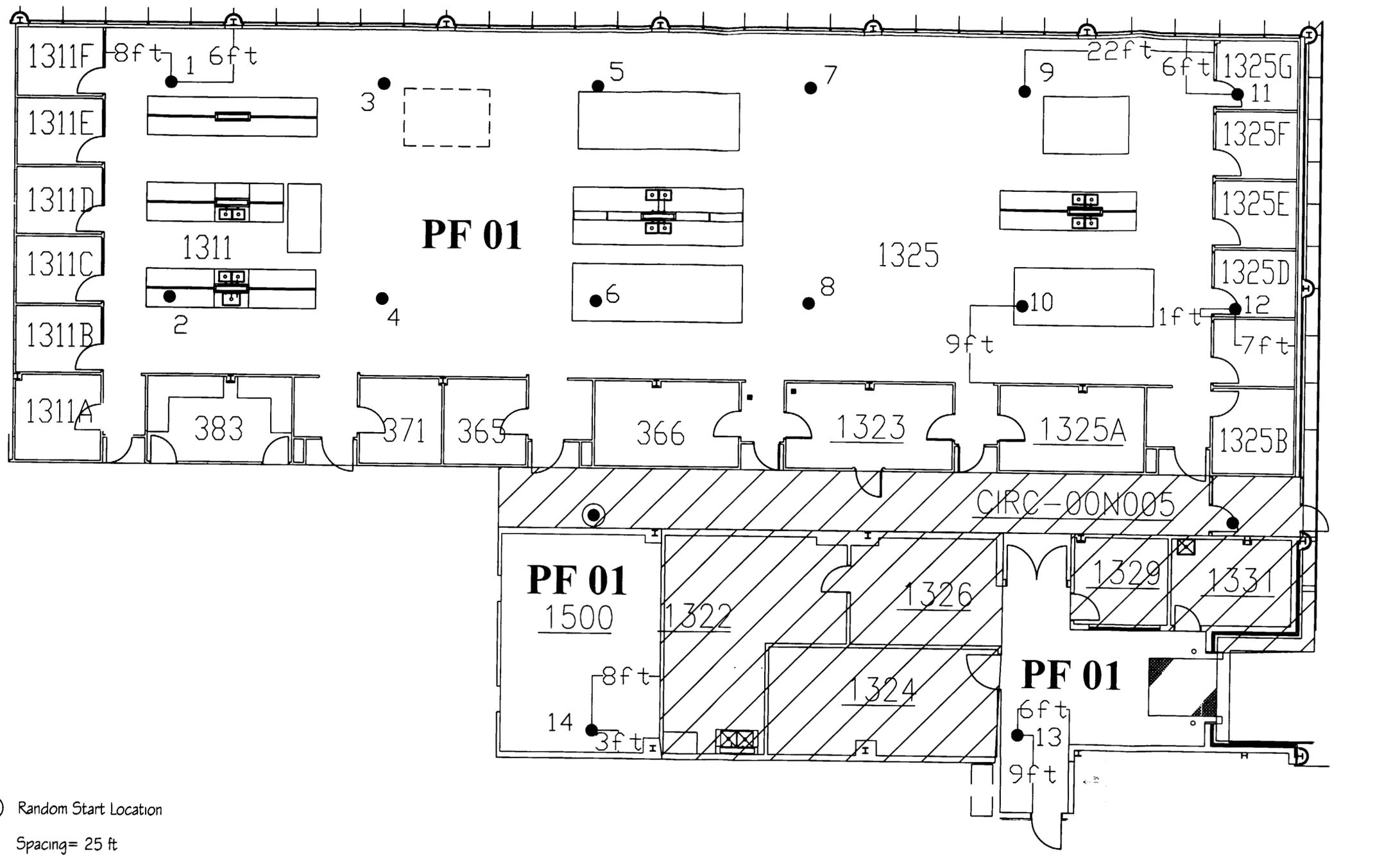
Pfizer Global Research and Development
Plymouth Township Facility
QA Survey Package

Building: PTF	Survey Unit: PF01	Page 5 of ____

Surveyor Comments:

Package Signatures:	
Survey Package Preparation	
Package Prepared By:	Date:
Preparation Reviewed By:	Date:
Survey Completion	
Survey Completed by:	Date:
Survey Completed by:	Date:
Survey Package Review and Closeout	
Package Reviewed by:	Date:



Random Start Location

Spacing= 25 ft

Pfizer Global Research and Development Plymouth Township Facility QA Survey Package		
Building: PTF	Survey Unit: PF01	Page: of

Quality Assurance Survey Results

Building PTF Survey Unit PF01 Class 2

Location Code	Total Beta Activity Measurements		Removable Activity Measurements			
			Tritium		Carbon-14	
	Activty	MDC	Activity	MDC	Activity	MDC
PTF-PF01-F1-T-001	2563 ± 4402	1515	17 ± 8	19	17 ± 8	20
PTF-PF01-B1-B-002	-374 ± 2725	1515	18 ± 8	19	11 ± 7	20
PTF-PF01-F1-C-003	-174 ± 2871	1515	20 ± 9	19	16 ± 8	20
PTF-PF01-F1-V-004	427 ± 3269	1515	19 ± 9	19	8 ± 6	20
PTF-PF01-F1-T-005	1629 ± 3947	1515	20 ± 9	19	8 ± 6	20
PTF-PF01-B1-B-006	93 ± 3054	1515	19 ± 9	19	5 ± 4	20
PTF-PF01-F1-C-007	-574 ± 2571	1515	15 ± 8	19	12 ± 7	20
PTF-PF01-F1-V-008	360 ± 3227	1515	24 ± 10	19	12 ± 7	20
PTF-PF01-F1-T-009	1962 ± 4115	1515	15 ± 8	19	10 ± 6	20
PTF-PF01-B1-B-010	-40 ± 2964	1515	15 ± 8	19	8 ± 6	20
PTF-PF01-F1-T-011	2096 ± 4181	1515	19 ± 9	19	7 ± 5	20
PTF-PF01-F1-T-012	1829 ± 4049	1515	21 ± 9	19	8 ± 6	20
PTF-PF01-F1-P-013	294 ± 3185	1515	24 ± 10	19	12 ± 7	20
PTF-PF01-F1-P-014	1428 ± 3842	1515	19 ± 9	19	12 ± 7	20
Summary for Survey Unit # PF01 (14 detail records)						
Average	823		19		10	
Minimum	-574		15		5	
Maximum	2563		24		17	
Standard Deviation	1048		3		3	

Note: All total activity results reported in dpm/100cm^2, all removable activity results reported in gross cpm/100cm^2.

Quality Assurance Survey Results

Building PTF Survey Unit PF02 Class 2

Location Code	Total Beta Activity Measurements		Removable Activity Measurements			
			Tritium		Carbon-14	
	Activty	MDC	Activity	MDC	Activity	MDC
PTF-PF02-F1-V-001	-133 ± 3188	1639	23 ± 9	19	10 ± 6	20
PTF-PF02-S1-W-002	-601 ± 2874	1639	19 ± 9	19	11 ± 7	20
PTF-PF02-S1-W-003	-801 ± 2728	1639	8 ± 6	19	13 ± 7	20
PTF-PF02-B1-B-004	-734 ± 2778	1639	19 ± 9	19	13 ± 7	20
PTF-PF02-B1-B-005	-534 ± 2921	1639	20 ± 9	19	10 ± 6	20
PTF-PF02-B1-B-006	-1001 ± 2574	1639	24 ± 10	19	14 ± 7	20
PTF-PF02-F1-V-007	-267 ± 3101	1639	11 ± 7	19	8 ± 6	20
PTF-PF02-F1-V-008	-601 ± 2874	1639	29 ± 11	19	16 ± 8	20
PTF-PF02-B1-B-009	133 ± 3354	1639	15 ± 8	19	6 ± 5	20
PTF-PF02-B1-B-010	-200 ± 3145	1639	15 ± 8	19	9 ± 6	20
PTF-PF02-B1-B-011	133 ± 3354	1639	24 ± 10	19	13 ± 7	20
PTF-PF02-F1-V-012	267 ± 3434	1639	22 ± 9	19	8 ± 6	20
PTF-PF02-F1-V-013	-133 ± 3188	1639	22 ± 9	19	12 ± 7	20
PTF-PF02-F1-V-014	-400 ± 3012	1639	21 ± 9	19	10 ± 6	20
PTF-PF02-B1-B-015	-133 ± 3188	1639	17 ± 8	19	10 ± 6	20
Summary for Survey Unit # PF02 (15 detail records)						
Average	-334		19		11	
Minimum	-1001		8		6	
Maximum	267		29		16	
Standard Deviation	373		5		3	

Note: All total activity results reported in dpm/100cm^2, all removable activity results reported in gross cpm/100cm^2.

Quality Assurance Survey Results

Building PTF Survey Unit PF03 Class 2

Location Code	Total Beta Activity Measurements		Removable Activity Measurements			
			Tritium		Carbon-14	
	Activty	MDC	Activity	MDC	Activity	MDC
PTF-PF03-F1-V-001	601 ± 3351	1503	27 ± 10	19	12 ± 7	20
PTF-PF03-F1-T-002	2336 ± 4277	1503	18 ± 8	19	11 ± 7	20
PTF-PF03-F1-V-003	334 ± 3185	1503	20 ± 9	19	13 ± 7	20
PTF-PF03-F1-V-004	-267 ± 2774	1503	20 ± 9	19	13 ± 7	20
PTF-PF03-F1-V-005	667 ± 3391	1503	18 ± 8	19	6 ± 5	20
PTF-PF03-F1-V-006	67 ± 3009	1503	20 ± 9	19	10 ± 6	20
PTF-PF03-F1-V-007	-133 ± 2870	1503	26 ± 10	19	13 ± 7	20
PTF-PF03-F1-V-008	667 ± 3391	1503	12 ± 7	19	13 ± 7	20
PTF-PF03-F1-V-009	400 ± 3227	1503	16 ± 8	19	13 ± 7	20
PTF-PF03-F1-V-010	734 ± 3431	1503	22 ● 9	19	17 ± 8	20
PTF-PF03-F1-V-011	601 ± 3351	1503	27 ± 10	19	11 ● 7	20
PTF-PF03-F1-V-012	734 ± 3431	1503	16 ± 8	19	15 ± 8	20
PTF-PF03-S1-D-013	534 ± 3310	1503	11 ± 7	19	13 ± 7	20
PTF-PF03-F1-V-014	334 ± 3185	1503	21 ± 9	19	12 ± 7	20
PTF-PF03-F1-P-015	267 ± 3142	1503	72 ± 17	19	8 ± 6	20
Summary for Survey Unit # PF03 (15 detail records)						
Average	525		23		12	
Minimum	-267		11		6	
Maximum	2336		72		17	
Standard Deviation	588		14		3	

Note: All total activity results reported in dpm/100cm^2, all removable activity results reported in gross cpm/100cm^2.

Quality Assurance Survey Results

Building PTF Survey Unit PF04 Class 3

Location Code	Total Beta Activity Measurements		Removable Activity Measurements			
			Tritium		Carbon-14	
	Activty	MDC	Activity	MDC	Activity	MDC
PTF-PF04-F1-P-001	40 ± 3229	1609	21 ± 9	19	15 ± 8	20
PTF-PF04-F1-V-002	-694 ± 2727	1609	24 ± 10	19	13 ± 7	20
PTF-PF04-F1-V-003	507 ± 3511	1609	21 ± 9	19	10 ± 6	20
PTF-PF04-F1-P-004	-93 ± 3144	1609	19 ± 9	19	13 ± 7	20
PTF-PF04-F1-V-005	240 ± 3353	1609	17 ± 8	19	8 ± 6	20
PTF-PF04-F1-C-006	-694 ± 2727	1609	18 ± 8	19	9 ± 6	20
PTF-PF04-F1-C-007	-27 ± 3187	1609	18 ± 8	19	5 ± 4	20
PTF-PF04-F1-P-008	-227 ± 3056	1609	8 ± 6	19	8 ± 6	20
PTF-PF04-F1-P-009	174 ± 3312	1609	13 ± 7	19	14 ± 7	20
PTF-PF04-F1-P-010	-294 ± 3011	1609	14 ± 7	19	3 ± 3	20
PTF-PF04-F1-P-011	441 ± 3472	1609	20 ± 9	19	13 ± 7	20
PTF-PF04-F1-C-012	-27 ± 3187	1609	23 ± 9	19	7 ± 5	20
PTF-PF04-F1-V-013	-160 ± 3100	1609	21 ± 9	19	12 ± 7	20
PTF-PF04-F1-P-014	-227 ± 3056	1609	25 ± 10	19	8 ± 6	20
Summary for Survey Unit # PF04 (14 detail records)						
Average	-74		19		10	
Minimum	-694		8		3	
Maximum	507		25		15	
Standard Deviation	357		5		4	

Note: All total activity results reported in dpm/100cm^2, all removable activity results reported in gross cpm/100cm^2.

Quality Assurance Survey Results

Building PTF Survey Unit PF05 Class 3

Location Code	Total Beta Activity Measurements		Removable Activity Measurements			
			Tritium		Carbon-14	
	Activty	MDC	Activity	MDC	Activity	MDC
PTF-PF05-F1-T-001	374 ± 3007	1406	26 ± 10	19	13 ± 7	20
PTF-PF05-F1-T-002	1642 ± 3769	1406	16 ± 8	19	11 ± 7	20
PTF-PF05-F1-C-003	-227 ± 2568	1406	20 ± 9	19	14 ± 7	20
PTF-PF05-F1-C-004	641 ± 3183	1406	11 ± 7	19	11 ± 7	20
PTF-PF05-F1-V-005	975 ± 3389	1406	17 ± 8	19	16 ± 8	20
PTF-PF05-F1-C-006	1041 ± 3429	1406	21 ± 9	19	11 ± 7	20
PTF-PF05-F1-C-007	1442 ± 3659	1406	20 ± 9	19	15 ± 8	20
PTF-PF05-F1-C-008	-27 ± 2722	1406	22 ± 9	19	15 ± 8	20
PTF-PF05-F1-C-009	240 ± 2915	1406	16 ± 8	19	8 ± 6	20
PTF-PF05-F1-C-010	774 ± 3267	1406	17 ± 8	19	18 ± 8	20
PTF-PF05-F1-T-011	2109 ± 4013	1406	28 ± 10	19	9 ± 6	20
PTF-PF05-F1-C-012	1041 ± 3429	1406	23 ± 9	19	6 ± 5	20
PTF-PF05-F1-T-013	2109 ± 4013	1406	14 ± 7	19	8 ± 6	20
PTF-PF05-F1-C-014	441 ± 3052	1406	23 ± 9	19	10 ± 6	20
Summary for Survey Unit # PF05 (14 detail records)						
Average	898		20		12	
Minimum	-227		11		6	
Maximum	2109		28		18	
Standard Deviation	731		5		3	
Summary for Building # PTF (72 detail records)						
Avg	360		20		11	
Min	-1001		8		3	
Max	2563		72		18	

Note: All total activity results reported in dpm/100cm^2, all removable activity results reported in gross cpm/100cm^2.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