REPORT OF RADIOLOGICAL SURVEY

For:

US Food and Drug Administration
Gulf Coast Seafood Laboratory
1 Iberville Road
Dauphin Island, AL 36528

November 2019

Prepared by:

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ACRONYMS

ALARA	As Low As Reasonably Achievable
Clym	Clym Environmental Services, LLC
CF	Correction Factor
CFR	Code of Federal Regulations
CFSAN	Center for Food Safety and Applied Nutrition
COC	Chain of Custody
CPM	Counts Per Minute
DCGL	Derived Concentration Guideline Level
DPM	Disintegrations Per Minute
DQA	Data Quality Assessment
DQO	Data Quality Objective
DSV	Default Screening Value
FDA	United States Food and Drug Administration
FSS	Final Status Survey
GCPM	Gross Counts Per Minute
GCSL	Gulf Coast Seafood Laboratory
HSA	Historical Site Assessment
LBGR	Lower Bound of the Gray Region
LSC	Liquid Scintillation Counter
MARSSIM	Multi-Agency Radiation Survey and Site Investigation Manual
MDC	Minimum Detectable Concentration
MDCR	Minimum Detectable Count Rate
NCPM	Net Counts Per Minute
NRC	United States Nuclear Regulatory Commission
QA	Quality Assurance
ROI	Region of Interest
RPP	Radiation Protection Program
RSO	Radiation Safety Officer
TEDE	Total Effective Dose Equivalent
TEI	Triumvirate Environmental, Inc.

1.0 INTRODUCTION

The U.S. Food and Drug Administration (FDA) is organized into centers specific to its research and regulatory focus. One of these is the Center for Food Safety and Applied Nutrition (CFSAN). In support of its mission, CFSAN has and continues to conduct research employing various radiolabeled compounds and radioactive sealed sources at laboratory facilities throughout the country. One of CFSAN's facilities, the Gulf Coast Seafood Laboratory (GCSL, 1 Iberville Drive, Dauphin Island, AL 36528) conducted research involving the possession, use and storage of radioactive materials authorized by the U.S. Nuclear Regulatory Commission (NRC) via Radioactive Materials license number No. 01-15770-01 (with 21 attachments, expiring June 30, 2023). This license provides a limited scope of use that is associated with life sciences research activities. Given that FDA is no longer pursuing the use of radioactive materials at the GCSL, this radioactive materials license is being terminated. In support of license termination, decommissioning surveys and assessments are required. This report details the decommissioning surveys conducted and offers a conclusion derived from those surveys.

The NRC provides guidance on the radiological decommissioning of facilities such as the GCSL in the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM). The FDA has engaged Clym Environmental Services, LLC (Clym) to assist in the implementation of the relevant steps of the MARSSIM process for the radiological assessment of the GCSL. The FDA has contracted Clym to perform this service through a subcontract with its hazardous, biological and radioactive waste management services provider, Triumvirate Environmental, Inc. (TEI). Clym is a State of Maryland radioactive materials licensee (MD-21-035-01, expiring 1/31/2027) and routinely provides such radiation safety support services to its customers. On site surveys and assessments were conducted by Clym under the authority of the GCSL radioactive materials license. It is noted that Clym's Project Manager also serves as the contracted Radiation Safety Officer (RSO) for the Gulf Coast Seafood Laboratory.

2.0 SITE DESCRIPTION AND HSITORY

2.1 Historical Site Assessments

The MARSSIM process can be simply divided into four main phases of data collection and review: Planning, Conducting, Assessing and Decision Making. The first phase, Planning, incorporates the Historical Site Assessment. The HSA is later followed by other surveys ultimately leading to the Final Status Survey (FSS). The HSA is intended to collect existing data relevant to site activities involving the use of radioactive materials from the start of those activities to the present time. The intent of the HSA is further defined depending on the type of activities conducted. Given the limited scope of operations associated with FDA research at the GCSL, namely toxin studies in aquatic animals, the HSA is specifically intended to: identify potential and known sources of radioactive material and/or radioactive contamination based on existing data; assess the likelihood for contaminant

migration; provide useful information for designing scoping and characterization surveys; provide initial classification of the site, or survey units within the site, as impacted or non-impacted; and consider the areas and systems affected by the infrastructure improvements. A thorough historical site assessment was conducted in association with facility renovations that took place in 2006 (Reference "Report of Radiological Survey", Clym Environmental Services, LLC, 2006). This assessment was used as a basis, in conjunction with more recent descriptions of radioactive materials usage, for determining impacted areas of the GCSL facility.

It should be noted that the initial classification is the catalyst for future phases and is critical to the ultimate surveys that follow. This initial classification can be further defined after the completion of scoping and characterization surveys and therefore is a very basic, first impression of the possibility for radioactive contamination in a given area. "Impacted" then is meant to describe any area within the Facility that has a reasonable opportunity for radioactive contamination to be present. The reasonableness of this assumption might include knowledge of past operations, lack of knowledge of past operations, storage strategies, contaminant migration potential, or the proximity of an area as compared to known areas of radioactive material use or storage. "Non-impacted" therefore is meant to define an area where there is no reasonable possibility, or an extremely low probability, for radioactive contamination.

2.2 Site Description

The FDA/CFSAN/GCSL facility at 1 Iberville Drive, Dauphin Island, AL is generally described as follows:

- One-story primary building with several additions and/or outbuildings, consisting of approximately 17,000 square feet on 4.2 acres of which CFSAN is the sole occupant

- The GCSL facility was commissioned in 1963 and has been occupied by CFSAN (or its predecessors) from that time until present day

- CFSAN plans to continue its occupancy and use of the facility in the future, but without the use of radioactive materials requiring specific licensure from the NRC

2.3 Site Ownership

The facility and site are presently owned by the U.S Government. It is occupied by FDA/CFSAN and managed by the FDA Office of Facilities, Engineering, and Mission Support Services (OFEMS).

2.4 Radionuclides of Concern

The radionuclides possessed and used by GCSL staff include phosphorus-32 (^{32}P), hydrogen-3 (^{3}H or tritium) and carbon-14 (^{14}C). Given that ^{32}P is a short-lived radionuclide and has not been used in the six months prior to survey, the radionuclides of concern for this survey were ^{3}H and ^{14}C.

2.5 Previous Radiological Surveys and Assessments

Periodic contamination surveys were conducted in all areas where radioactive materials were used or stored during the term of the radioactive materials license. In addition, a substantial facility wide survey was conducted in 2006 in support of a renovation project at the GCSL. The results of these surveys supported the designation of the radionuclides of concern.

3.0 RADIOLOGICAL SURVEYS

The Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM) provides procedures and calculations to provide statistically defensible evidence that survey results meet the current dose-based release criteria required by the Nuclear Regulatory Commission for facilities operating under radiological controls. This process culminates in the Final Status Survey (FSS). Inputs into the Final Status Survey design are from two sources: pre-release surveys and dose modeling. The pre-release surveys, including the historical site assessment, scoping survey, the characterization survey and the remedial action support survey, provide information into planning the FSS. The dose modeling provides Derived Concentration Guideline Levels (DCGLs) for both the statistical test used in qualifying the uniformly distributed residual radioactivity and for the elevated measurement comparison of localized residual radioactivity.

MARSSIM provides a standardized statistical approach to sampling and describes the statistical tools, tests and assumptions needed. The intent of the statistical approach is to develop a representation of the distribution of residual radioactivity in the survey unit utilizing the least number of samples. Non-parametric statistical tests are used by MARSSIM to minimize the dependence on normality since many of these sampling distributions are skewed by small areas of localized radioactivity that can result from remediation activities.

Sampling is required if a surface scan of adequate sensitivity cannot be obtained to show that the release criteria is met. Sampling and direct measurement cannot fully replace a 100% scan in terms of spatial coverage and therefore, the location of samples and the number of samples must provide enough information about the overall distribution of residual radioactivity to make a decision on releasing a survey unit.

Given the critical importance of sufficient data, scoping surveys must meet the following key objectives: conservative classification, thorough consideration of all surfaces and designed to meet Final Status requirements based on initial classification.

A scoping survey is performed to substantiate and better define potential radioactive contaminants including the general extent of any residual activity. These surveys usually consist of surface scans and direct radiation level measurements at representative points. Samples of residues from surfaces and other areas of potential contamination should be analyzed to determine radionuclide specific activity. Should residual activity be detected, Clym proposed to proceed directly with characterization surveys.

Within any survey design, the unit to be surveyed must be defined by type and risk level. Clym has identified two subgroups of these units: building structures and building systems. Building structures consist of ceilings, upper walls, shelves, lower walls, casework and sinks, and floors. Building systems consist of sink traps and drain lines, and chemical fume hoods, ducting and exhaust blower motors, filters and fans. There are no systems associated with the waste storage module. All shelves, lower walls, grating and floors within the storage module are considered "high risk" units.

The percentage of any unit to be surveyed is based on the potential or known levels of residual contamination. The amount of coverage designated for each area classification has been provided in Table 1.

Table 1: Scoping Survey Percentage of Surface Area Surveyed

Area Classification	*Building Structures*					*Building Systems*	
	Ceiling	Upper Walls	Lower Walls & Shelves	Casework	Floors	Traps & Drain Lines	Hoods & Ducts
Impacted	10%	10%	50%	50%	50%	100% (traps)	100% (hoods)

All scans and sample collection activities were conducted in accordance with industry standard procedures and good work practices. Surface scans will be conducted with special attention afforded to cracks, joints and other areas where contamination may have accumulated. Wipe samples will be used to evaluate the presence of removable surface contamination. Surveys in all areas will focus on "high risk" surfaces. Survey units will be divided into square meters for sampling using a square shaped grid design.

MARSSIM assigns a greater level of effort on surveys conducted in areas that have, or had, the highest potential for contamination. The process by which an area is classified is based on the radiological characteristics. Areas that have no reasonable potential or extremely low probability of residual contamination are classified as non-impacted. Areas with some

potential for residual contamination are classified as impacted.

The history of radioactive materials possession, use and storage at the GCSL facility is detailed in license related documents. Additional information was obtained from a review of historical records and interviews with the operational personnel. Records indicated that long-lived, open-form radioactive materials that were used at the facility included: Tritium and 14-Carbon (^{3}H and ^{14}C).

The Final Status survey was designed to designate each survey unit for surface scans and swipe samples. In an attempt to gain operational efficiency, the scoping survey was designed to meet the requirements of the Final Status Survey. The radioactive waste compartment of the waste storage module was designated as impacted. The contiguous hazardous waste compartment was also designated for survey.

Scoping surveys were designed to evaluate: 1) total surface activity using surface scans as well as static measurements, and 2) removable surface contamination using smear samples. These surveys would focus on surfaces deemed "high risk areas". The "lower walls" in known radioactive material usage areas was defined as the surface area from the floor to a height of approximately six feet. Surface scans were designated to cover 50% of accessible floor and 50% of accessible lower wall areas. Smear sample locations were determined using the surveyor's professional judgment. Any area found to have residual surface contamination was designated for further evaluation as outlined below:

(1) Surface Scans
Any surface area found to be greater than 20% above the established background for the matrices being evaluated.

(2) Smears
Any activity detected above the minimum detectable.

Any area found to be at the investigative level for surface scans would be designated for further evaluation. This evaluation would be made using static measurements and smears to quantify the level of the contamination and better define the area.

Based on the history of radioactive material use at the GCSL facility and the survey data available, scoping surveys were designed to meet final status survey requirements. This design would allow for the efficient collection of data and maximize outsourced labor. The next step was to determine the Derived Concentration Guideline Levels (DCGLs) and select the Final Status Survey method in order to demonstrate compliance with the provisions specified in NRC regulations for releasing the waste storage module for unrestricted use.

Surface contamination screening levels were obtained using the values provided in NUREG-1757, Volume 1, Appendix B, Table B.1. A listing of the adopted screening values

for building/surface contamination is provided in Table 2.

Table 2: Surface Contamination Screening Values

Radionuclide	Symbol	Acceptable Screening Level (dpm/100cm^2)
Tritium	^{3}H	1.2e+08
14-Carbon	^{14}C	3.7e+06

Survey instruments were selected based on the detection sensitivities to the radiations of concern. The detection sensitivity of large area gas proportional detectors was evaluated to ensure detection levels are within acceptable parameters (10%-50% of the DCGL). These detectors were equipped with 0.4 mm thick windows. It was determined that tritium (^{3}H) would be evaluated independently, relying solely on smear samples to determine residual surface contamination. The DCGL was adjusted from 1.2e+08 dpm/100cm^2 to 1.2e+07 dpm/100cm^2 to reflect a swipe efficiency of ten percent (10%).

The DCGL for ^{14}C was found to be 3.7e+06 dpm/100cm^2. Minimum detectable concentration (MDC) for the selected instrumentation can be calculated at the 95% confidence level using a variation of common equations such as those found in NUREG 1507, "Minimum Detectable Concentrations with Typical Radiation Survey instruments for Various Contaminants and Field Conditions" Table 3.1 (Strom & Stansbury, 1992). A 25% surface efficiency was applied to the calibrated efficiency to account for attenuation for less than 0.4 MeV beta-emitting radionuclides.

A typical static MDC calculation for gas flow proportional detectors, for example, is provided here:

$$MDC_{static} = \frac{3 + 3.29\sqrt{B_R \cdot t_S \cdot (1 + \frac{t_S}{t_b})}}{t_S \cdot E_{tot} \cdot \frac{A}{100}}$$

Where:

MDC_{static}	=	minimum detectable concentration (dpm/100cm^2)
B_R	=	background count rate (counts per minute)
t_b	=	background count time (minutes)
t_s	=	sample count time (minutes)
E_{tot}	=	total detector efficiency for radionuclide of interest
A	=	detector probe area (cm^2)

Scanning MDC (95% confidence level) for the same instrument can be calculated using equations from MARSSIM (6-8, 6-9, 6-10). A typical MDC_{scan} calculation for gas flow proportional detectors is shown here:

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

Where:

MDC_{scan}	=	minimum detectable concentration (dpm/100cm^2)
d'	=	desired performance variable (1.38)
b_i	=	background count during the residence interval (counts)
i	=	residence interval (seconds)
p	=	surveyor efficiency (0.5)
E_{tot}	=	total detector efficiency for radionuclide of interest
A	=	detector probe area (cm^2)

Wipe sample counting MDC (95% confidence level) can be calculated using a variation of common equations such as those found in NUREG 1507, "Minimum Detectable Concentrations with Typical Radiation Survey instruments for Various Contaminants and Field Conditions" Table 3.1 (Strom & Stansbury, 1992). An example for a typical liquid scintillation counter is shown here:

$$MDC_{wipe\ sample} = \frac{3 + 3.29\sqrt{B_r \cdot t_s \cdot \left(1 + \frac{t_s}{t_b}\right)}}{t_s \cdot E}$$

Where:

$MDC_{wipe\ sample}$	=	minimum detectable concentration (dpm/100cm^2)
B_R	=	background count rate (counts per minute)
t_b	=	background count time (minutes)
t_s	=	sample count time (minutes)
E	=	instrument efficiency for radionuclide of interest

3.1 Field Measurements, Methods and Instrumentation

Surface scans and static measurements were made using scaler/rate meters (Ludlum model 221) equipped with large area gas proportional detectors (Ludlum model 43-37 and 43-68). Variations in background readings were found throughout the survey area. The primary contributing factor was determined to be variations in the

composition of surface matrices. Reference areas were located in adjacent areas that had not housed radioactive materials previously.

As an example, the MDC_{static} for the 43-37 detector on the floor (vinyl surface) was determined to be 138 dpm/100cm^2 using an averaged background of 806 cpm. The Static MDC is well below the the required fifty percent (50%) of the DCGL for ^{14}C. The MDC_{scan} was found to be 590 dpm/100cm^2 for the same surface matrix. These calculations are included with Attachment 5.

The minimum observational interval or hold time over a suspect area was specified for the first stage scan at 2 seconds. The detector was employed on the scanned surface at no greater than the prescribed speed as indicated below:

43-37: beta mode ½ a probe width per second (3 inches/second)

3.2 Laboratory Analysis of Smear Samples

The evaluation of removable surface activity was conducted using a dry paper wipe, covering an approximate area of 100 cm^2 while applying moderate pressure. A total of 1,256 smear samples were collected during scoping surveys. A summary of wipe sample distribution is provided in Attachment Three.

Clym Environmental Services, LLC analyzed the scoping survey smear samples using liquid scintillation counting techniques. A region of interest was established between 0 to 2000 keV. The typical minimum detectable activity for gross beta using a four-minute count time was 25 dpm. This was calculated using a background of 28 cpm and detection efficiency for tritium of 53%. Any sample found to have detectable activity in excess of the minimum detectable was designated for quantitative analysis.

It is noted that no scoping survey wipe sample was found to have activity greater than instrument MDA.

3.3 Activity Detected at or Above Investigative Levels

The evaluation of total and removable surface contamination identified no area of surface contamination at or above action levels.

4.0 FINAL STATUS SURVEY PLAN

All areas surveyed were combined into one (1) Class 3 survey unit, identified as Survey Unit One, totally approximately 5,166 square feet or 480 square meters. This survey unit includes the following rooms / areas: 101, 102, 103, 104, 105, 107, 108, 109, 110, 111, 112, 113, 116, 118, 119 and 302).

Table 3 Survey Units

Survey Unit	*Area (m^2)*
One	480

The Final Status Survey required surface scans and one-minute static measurements within the survey unit. Surface scans were completed in the survey unit during scoping surveys to the required specifications as detailed in Section 3.

4.1 Determining the Number of Data Points for Statistical Tests

This section details the process of determining the selection and implementation of statistical tests required by MARSSIM.

4.1.1 Contaminants Not Present in Background

The Sign Test was selected to compare beta emitting nuclides, or those contaminants not present in background (^{3}H and ^{14}C). The objective of the Final Status Surveys is to demonstrate that the residual radioactivity levels meet the release criterion. Scenario A has been selected to demonstrate this objective for residual contamination on building/structure surfaces. In demonstrating that this objective is met, the null hypothesis is tested (H_o), namely is the median concentration of residual radioactivity in the survey unit greater than the DCGL? The alternative hypothesis, H_a, would result in the median concentration of residual radioactivity in the survey unit being less than the DCGL.

H_o: The median concentration of residual radioactivity in the survey unit is greater than the DCGL.

The Type I error (α) was specified as 0.05 and a Type II decision error (β) was set at 0.05.

4.1.1.1 Calculate the Relative Shift

First, the DCGL, lower bound of the gray region (LBGR) and the standard deviation of the contaminants in each survey unit were used to calculate the relative shift. The LBGR was determined for each survey unit. Next, the standard deviation and relative shift were calculated for each survey unit.

If the relative shift was determined to be >3, the lower bound of the gray region (LBGR) is to be adjusted. The relative shift for each survey unit was

calculated and the LBGR adjusted to 3.

4.1.1.2 Determination of Sign p

The value of the relative shift calculated in section 4.1.1.1 was used to obtain the corresponding value of Sign p using Table 5.4 as found in NUREG-1575 (Revision 1, August 2000).

4.1.1.3 Determination of Decision Error Percentiles

The determination of percentiles, Z1-α and Z1-β was conducted by selecting the designated values using Table 5.2 as found in NUREG-1575 (Revision 1, August 2000).

4.1.1.4 Determine the Number of Data Points for the Sign Test

The number of data points for each survey unit was determined by selecting the designated values using Table 5.5 as found in NUREG-1575 (Revision 1, August 2000). The number of data points for the survey unit was determined to be 14. In following the recommendation of MARSSIM 5.5.2.2 the sample size was increased by 20% and rounded up to allow for potential data losses. Accounting for this increase, the total number of data points was 17.

5.0 FINAL STATUS SURVEY

A total of one (1) survey unit (Class 3) was designated for evaluation using Final Status Survey techniques. A one-meter square grid system was constructed in each survey area, to include the floors and lower walls. The designation for each surface in the survey unit was identified using an alphanumeric system. Diagrams of the areas included in the survey unit have been provided as Attachment Two.

For this survey, surface matrices were identified and references for establishing background for these matrices were collected. A copy of these results is included as Attachment One.

Random sample points were identified within the survey unit and a random starting point was determined. Sample points were designated using a random number generator after having assigned each grid coordinate a numerical value.

The results of static measurements made in the survey unit have been provided as Attachment Three. The results of swipe samples collected from the survey unit have been provided as Attachment Four.

5.1 Summary of Statistical Tests

The measurements made at designated locations as a result of FSS were evaluated.

5.1.1 Contaminants Not Present in Background

The Sign Test was selected to compare those contaminants not present in background (^{3}H and ^{14}C). The objective of the Final Status Survey is to demonstrate that the residual radioactivity levels meet the release criterion.

H_o: The median concentration of residual radioactivity in the survey unit is greater than the DCGL.

All measurements were found to be less than the DCGL. The average of the measurements made in each survey unit was determined. The measurement average in each survey unit was found to be less than the DCGL. The Sign test did not need to be performed as each survey unit met the release criterion.

6.0 QUALITY ASSURANCE

The performance of decommissioning activities has been managed within a framework of policies and procedures, which assure the validity and quality of data. Procedures were established for activities requiring the application of standard and approved methods to ensure regulatory requirements were met. These procedures document the technical competence of the survey approach thus ensuring the use of effective processes. Procedures utilized by Clym are documented using program-specific applications.

6.1 Daily Operational Checks for Portable Survey Instruments

The purpose of these procedures was to ensure portable scaler/rate meters equipped with gas proportional detectors were in proper working condition prior to placement into service. When an instrument failed an operational check, both the instrument and detector were removed from service until the discrepancy could be resolved.

Both source and background measurements must fall within the acceptable range established for the site and were performed as follows:

- ✓ Prior to beginning the performance of data measurements and/or scanning for the day,
- ✓ After the lunch or noon break,

- ✓ Any time the detector is suspected of being contaminated, and/or
- ✓ Any time instrument's operation is in question.

Daily instrument checks included:

1) a determination of operational readiness,
2) ambient background determination, and
3) check source reproducibility determination.

The check source reproducibility determination involved obtaining the data necessary to calculate the average source count and verify that each section of the detector face was reading within ± 10%. Additionally, the 3σ values for the background and check source counts were calculated. A copy of these daily checks has been provided as Attachment Five.

6.2 Internal Quality Assurance Checks

Quality assurance evaluations were conducted for each surveyor. These evaluations involved verification measurements to confirm Final Status Survey measurements for total surface contamination. Measurements were made at two- (2) randomly selected Final Status Survey sample points from each survey unit. The procedures and techniques utilized to make these measurements were identical to those used in the FSS. Additionally, surface scans were conducted on what were deemed "high risk" surfaces in each survey unit. "High risk" surfaces included laboratory bench tops, chemical fume hoods, fixtures, including doorknobs and light switches. This evaluation was conducted assessing the measured values for each survey point (both verification and FSS) to determine if overlap occurred at the 95% confidence level.

7.0 DISPOSITION OF MATERIALS AND WASTE

All licensed radioactive waste was removed from the site as of October 26, 2017 (see Attachment Six). The source from the liquid scintillation counter was removed and transferred to the device manufacturer on September 19, 2019.

8.0 CONCLUSION

The Final Status Surveys conducted by Clym on behalf of the FDA demonstrate compliance with the provisions specified in the Gulf Coast Seafood Laboratory's radioactive materials license and associated NRC regulations for release of the facility for unrestricted use. Therefore, Clym recommends that the GCSL petition the NRC for immediate termination of its radioactive materials license.

REFERENCES

1. NUREG-1507, "Minimum Detectable Concentrations with Typical Radiation Survey Instruments for Various Contaminants and Field Conditions", NRC-Washington, DC, June 1998

2. NUREG-1575, "Multi-Agency Radiological Survey and Site Investigation Manual, Revision 1", August 2000

3. NUREG-1757, Vol. 1, "Consolidated NMSS Decommissioning Guidance, Decommissioning Process for Materials Licenses", Final Report, NRC-Washington, DC, September 2002

4. NUREG-1757, Vol. 2, "Consolidated NMSS Decommissioning Guidance, Decommissioning Process for Materials Licenses", Final Report, NRC-Washington, DC, September 2003

5. Title 10, Code of Federal Regulations

Attachment One

Reference Matrices
Background Measurements

Reference Background Measurements for Surface Matrices

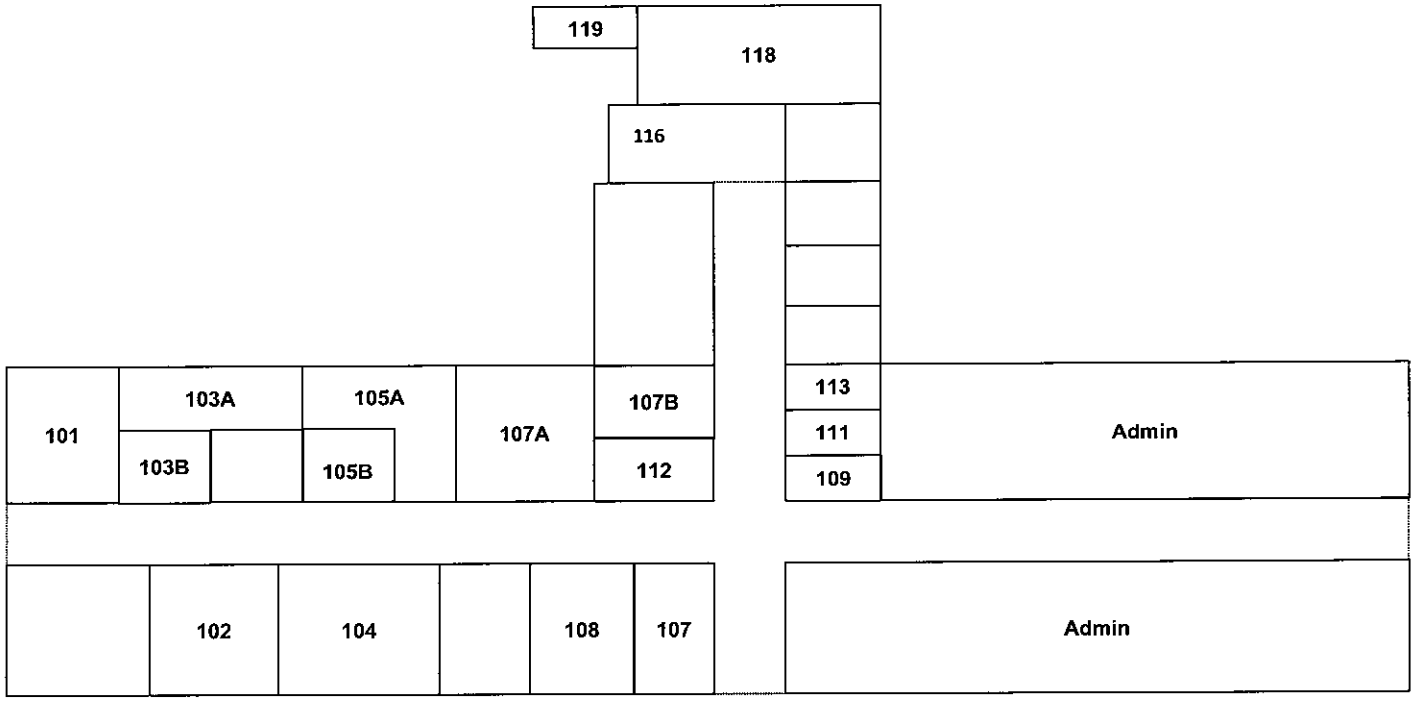
Scaler / Ratemeter L221 (#86286)

Detector 43-37 (#92501)

Matrix Description	Reference Area	MDC DPM/100cm^2	Average Background (CPM)	3σ	Expected Background Range CPM (+/- 3σ)		Individual One-Minute Static Measurements (CPM)									
Floor, vinyl	Admin Hall	138	806	64	741	870	812	774	838	769	795	802	812	818	823	816
Cinderblock, interior	Admin Hall	115	554	43	512	597	548	580	536	556	547	548	561	548	576	543
Ceramic tile	106	222	2118	159	1958	2277	2171	2180	2114	2096	2096	2184	2108	2138	2011	2080
Benchtop	106	142	853	68	786	921	837	879	866	867	818	855	861	884	822	844
Casework, metal	106	119	592	66	526	658	576	587	617	614	581	616	598	563	608	558
Cinderblock, exterior	100	133	748	59	689	807	766	747	722	784	720	732	758	753	748	750
Floor, acrylic	120	153	993	61	932	1054	1016	974	1023	986	1013	1007	986	963	981	980

Attachment Two

Survey Unit Maps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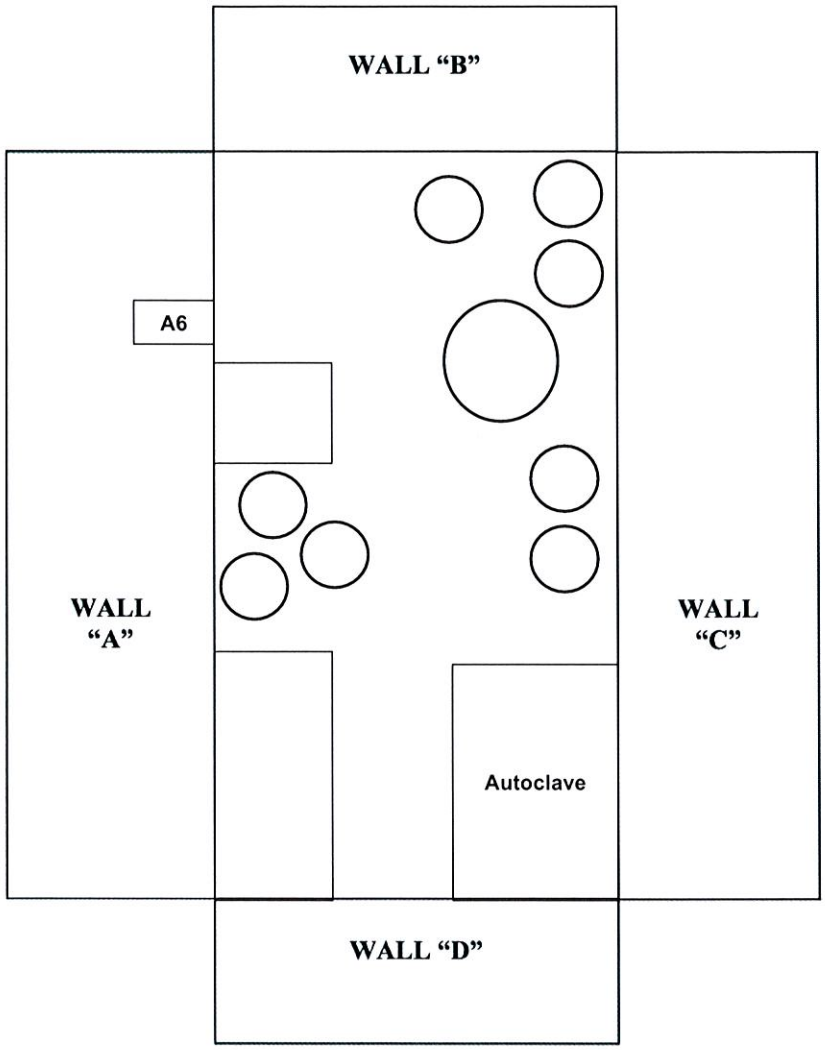
101
103A
103B
105A
105B
107A
107B
112
113
111
109
Admin
102
104
108
107
Admin
Main Entrance

302

CLYM	MONITORING AND SURVEY FORM	Surveyor: B. Pennington / L. Best	Date: March 22, 2019
		Client: FDA GCSL	Location: 101

Area Diagram:



Comments:
Drawing not to scale.
"E" = Ceiling, "F" = Floor
Approximate size 200 ft^2

Meter information:

L2221 (#86286)
43-37 (#92501)
DOC: 2/7/2019

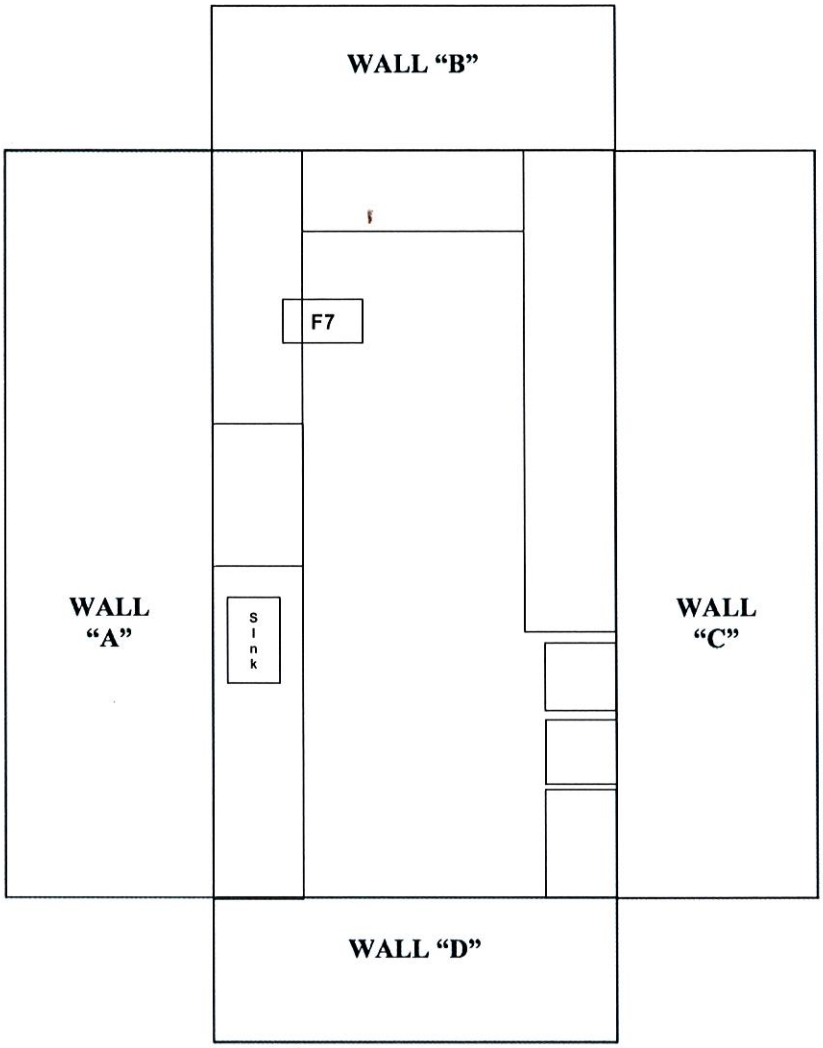
Note(s):

Final Status Point(s): A6
Matrix: Cinderblock (Background 806 cpm)
Static Measurement: 809 cpm

Grid "1" is determined by facing the subunit and is the first grid on the lower left

CLYM	MONITORING AND SURVEY FORM	Surveyor: B. Pennington / L. Best	Date: March 22, 2019
		Client: FDA GCSL	Location: 102

Area Diagram:



Comments:
Drawing not to scale.
"E" = Ceiling, "F" = Floor
Approximate size 200 ft^2

Meter information:

L2221 (#86286)
43-37 (#92501)
DOC: 5/22/2018

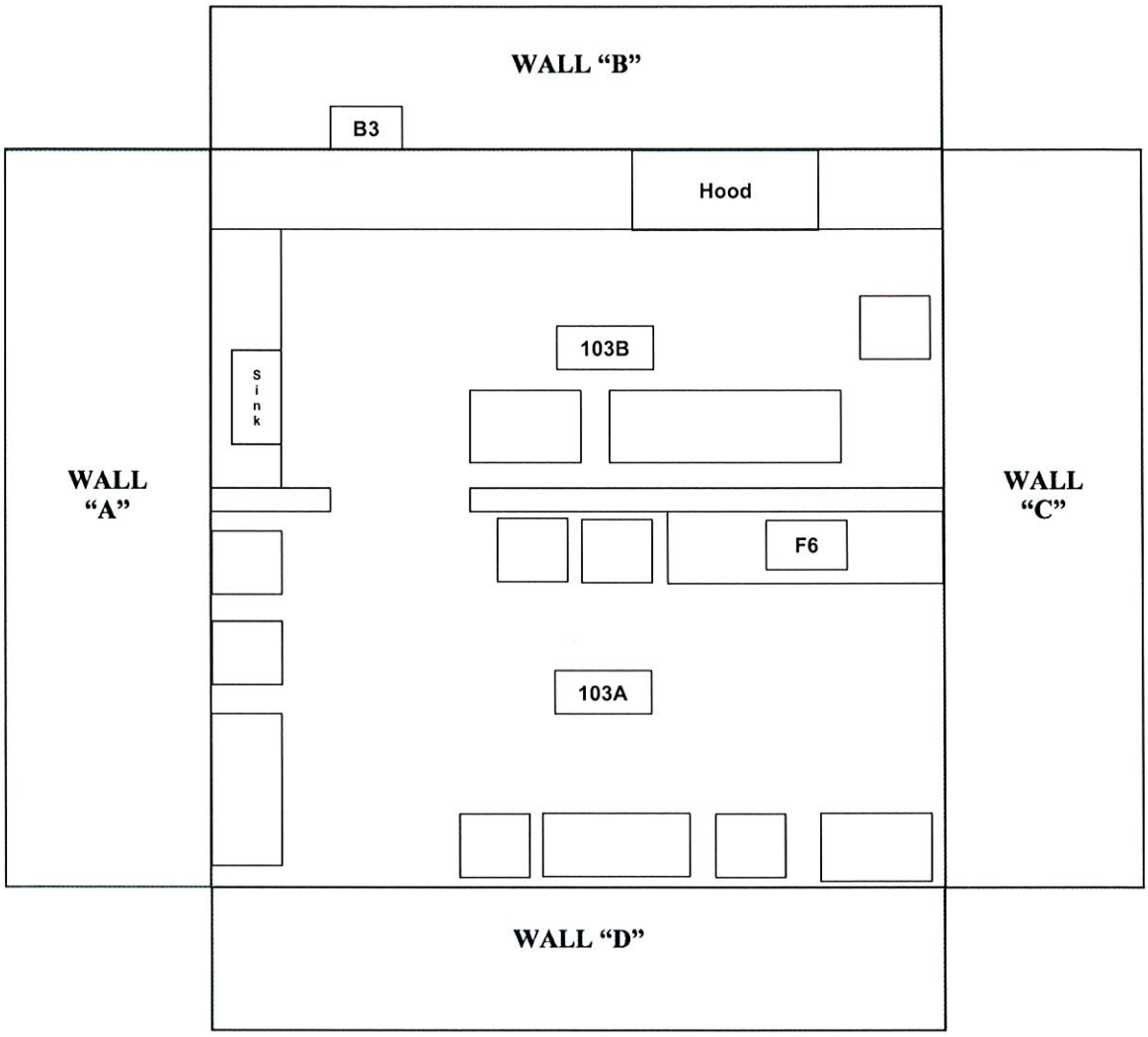
Note(s):

Final Status Point(s): F7
Matrix: Tile (Background 2118 cpm)
Static Measurement: 2142 cpm

Grid "1" is determined by facing the subunit and is the first grid on the lower left

CLYM	MONITORING AND SURVEY FORM	Surveyor: B. Pennington / L. Best	Date: March 21, 2019
		Client: FDA GCSL	Location: 103 A & B

Area Diagram:



Comments:
Drawing not to scale.
"E" = Ceiling, "F" = Floor
Approximate size 400 ft^2

Meter information:

L2221 (#86286)
43-37 (#92501)
DOC: 5/22/2018

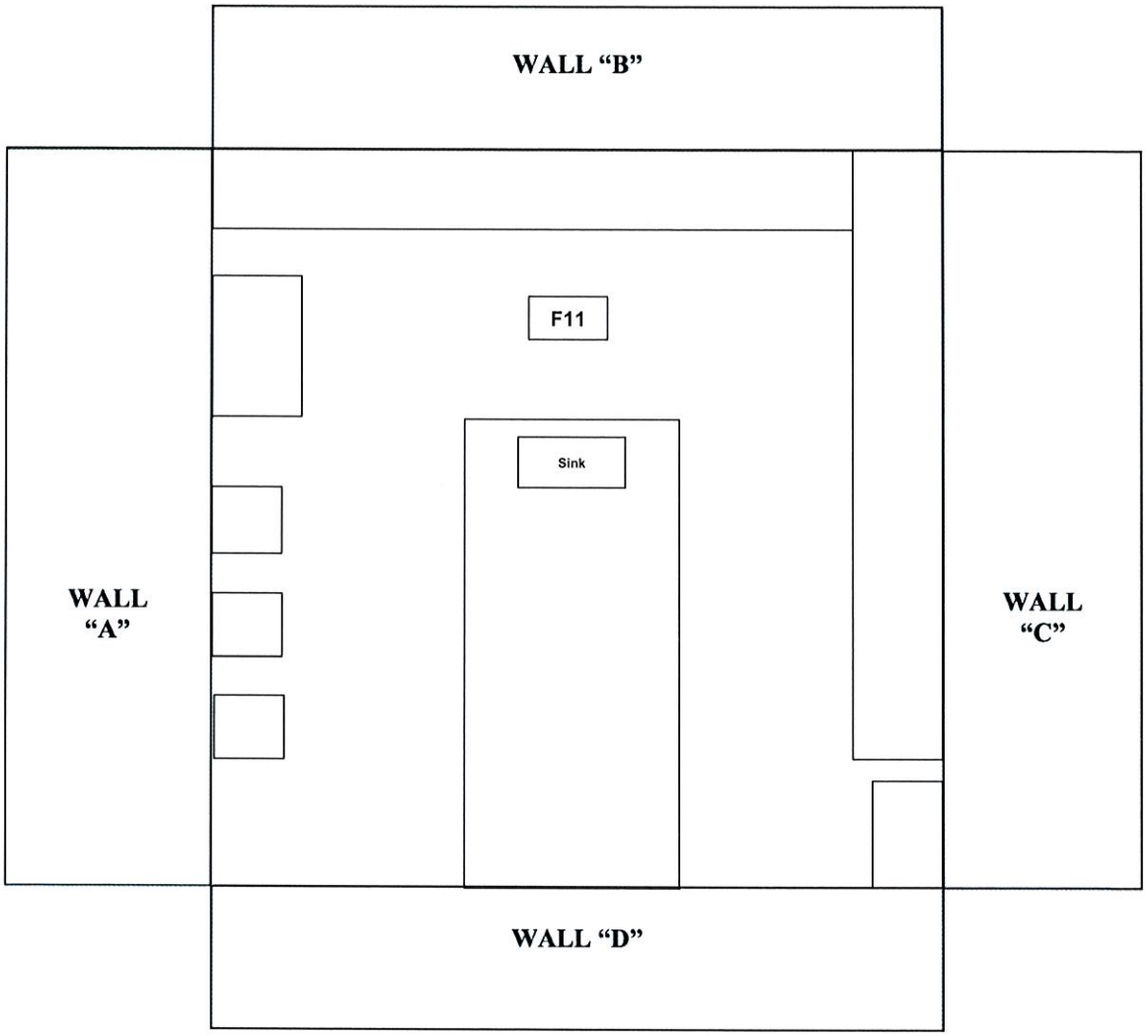
Note(s):

Final Status Point(s):	103A: F6, 103B: B3
Matrix:	Benchtop (Background 853 cpm)
Static Measurement:	870 cpm
Matrix:	Cinderblock (Background 554 cpm)
Static Measurement:	593 cpm

Grid "1" is determined by facing the subunit and is the first grid on the lower left

CLYM	MONITORING AND SURVEY FORM	Surveyor: B. Pennington / L. Best	Date: March 22, 2019
		Client: FDA GCSL	Location: 104

Area Diagram:



Comments:
Drawing not to scale.
"E" = Ceiling, "F" = Floor
Approximate size 400 ft^2

Meter information:

L2221 (#86286)
43-37 (#92501)
DOC: 2/7/2019

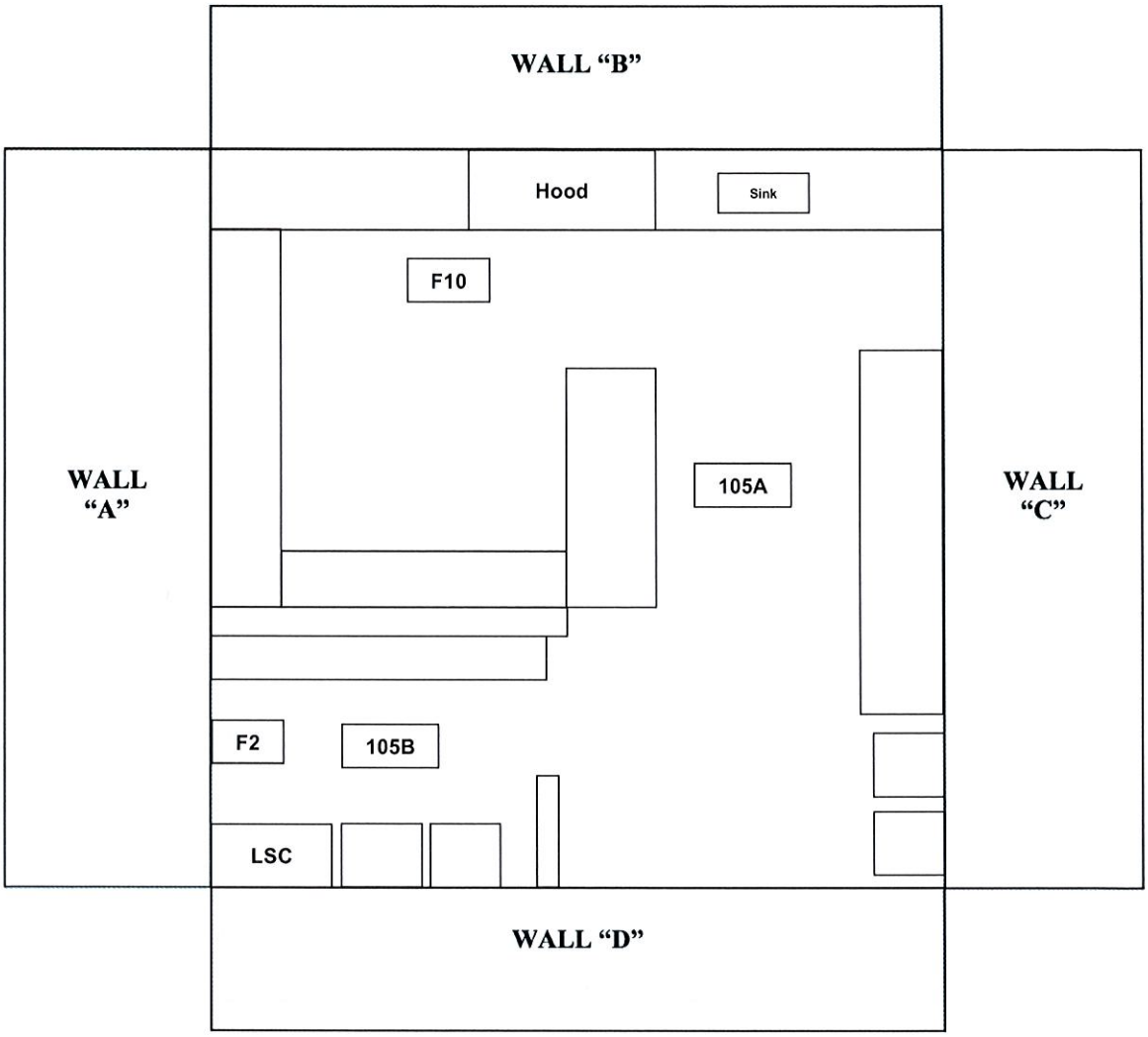
Note(s):

Final Status Point(s): F11
Matrix: Tile (Background 2118 cpm)
Static Measurement: 2243 cpm

Grid "1" is determined by facing the subunit and is the first grid on the lower left

CLYM	MONITORING AND SURVEY FORM	Surveyor: B. Pennington / L. Best	Date: March 21, 2019
		Client: FDA GCSL	Location: 105 A & B

Area Diagram:



Comments:
Drawing not to scale.
"E" = Ceiling, "F" = Floor
Approximate size 400 ft^2

Meter information:

L2221 (#86286)
43-37 (#92501)
DOC: 2/7/2019

Note(s):

Final Status Point(s):	105A: F10, 105B: F2
Matrix:	F10 Vinyl (Background 806 cpm)
Static Measurement:	780 cpm
Matrix:	F6 Benchtop (Background 806)
Static Measurement:	760 cpm

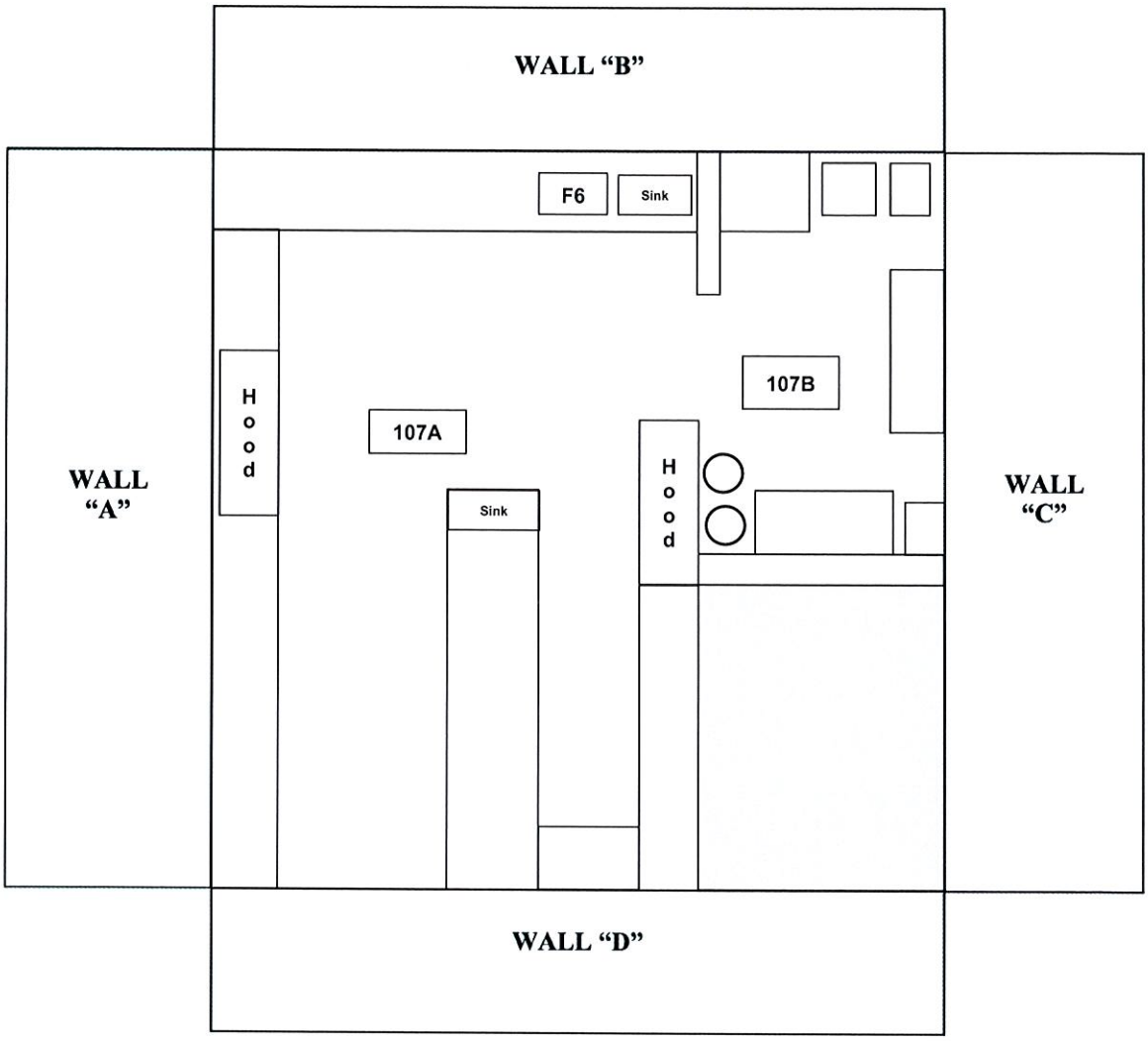
Grid "1" is determined by facing the subunit and is the first grid on the lower left

CLYM

MONITORING AND SURVEY FORM

Surveyor:	Date:
B. Pennington / L. Best	March 21, 2019
Client:	Location:
FDA GCSL	107 A & B

Area Diagram:



Comments:
Drawing not to scale.
"E" = Ceiling, "F" = Floor
Approximate size 500 ft^2

Meter information:

L2221 (#86286)
43-37 (#92501)
DOC: 2/7/2019

Note(s):

Final Status Point(s): 107A: F6
Matrix: F6 Benchtop (Background 853 cpm)
Static Measurement: 817 cpm

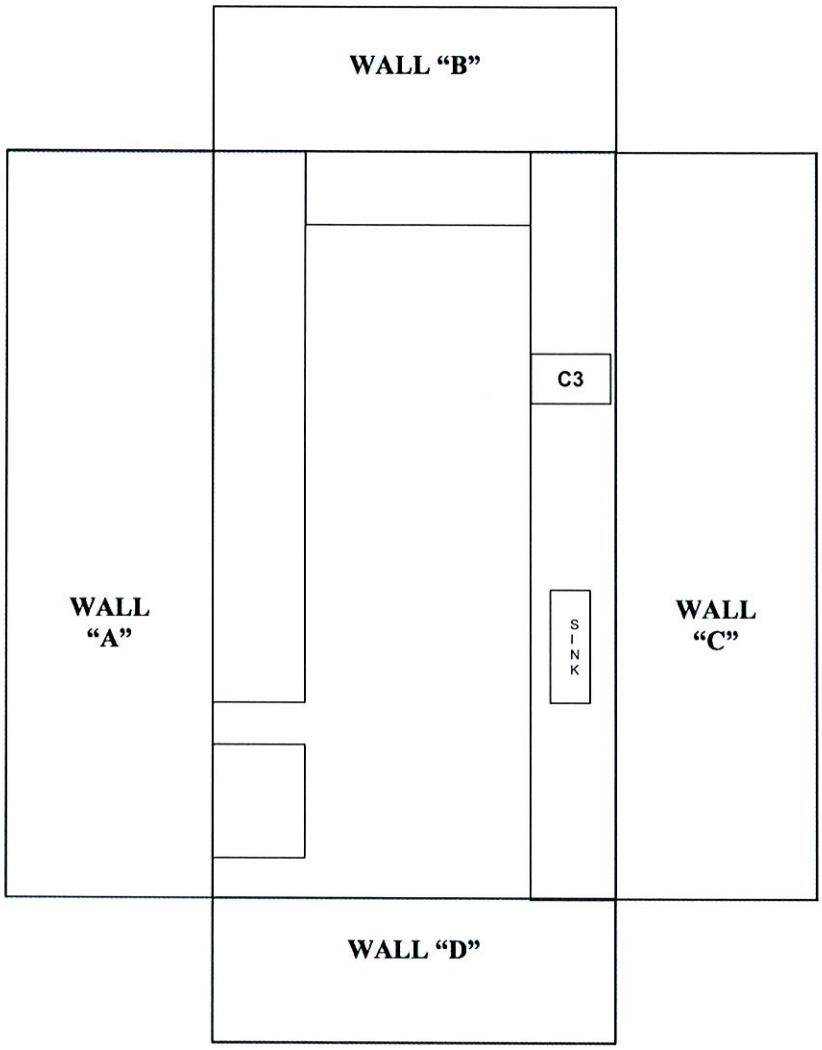
Grid "1" is determined by facing the subunit and is the first grid on the lower left

CLYM

MONITORING AND SURVEY FORM

Surveyor:	Date:
B. Pennington / L. Best	March 22, 2019
Client:	Location:
FDA GCSL	108

Area Diagram:



Comments:
Drawing not to scale.
"E" = Ceiling, "F" = Floor
Approximate size 200 ft^2

Meter information:

L2221 (#86286)
43-37 (#92501)
DOC: 2/7/2019

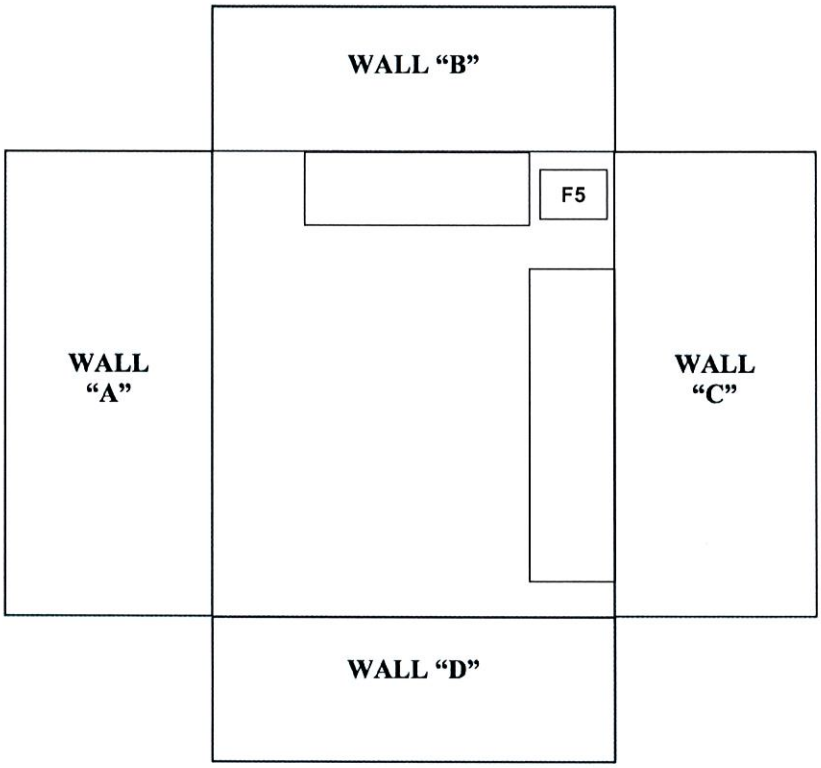
Note(s):

Final Status Point(s): C3
Matrix: Casework, Metal (Background 592 cpm)
Static Measurement: 572 cpm

Grid "1" is determined by facing the subunit and is the first grid on the lower left

CLYM	MONITORING AND SURVEY FORM	Surveyor: B. Pennington / L. Best	Date: March 21, 2019
		Client: FDA GCSL	Location: 109

Area Diagram:



Comments:
Drawing not to scale.
"E" = Ceiling, "F" = Floor
Approximate size 120 ft^2

Meter information:

L2221 (#86286)
43-37 (#92501)
DOC: 2/7/2019

Note(s):

Final Status Point(s): F5
Matrix: Cinderblock (Background 748 cpm)
Static Measurement: 733 cpm

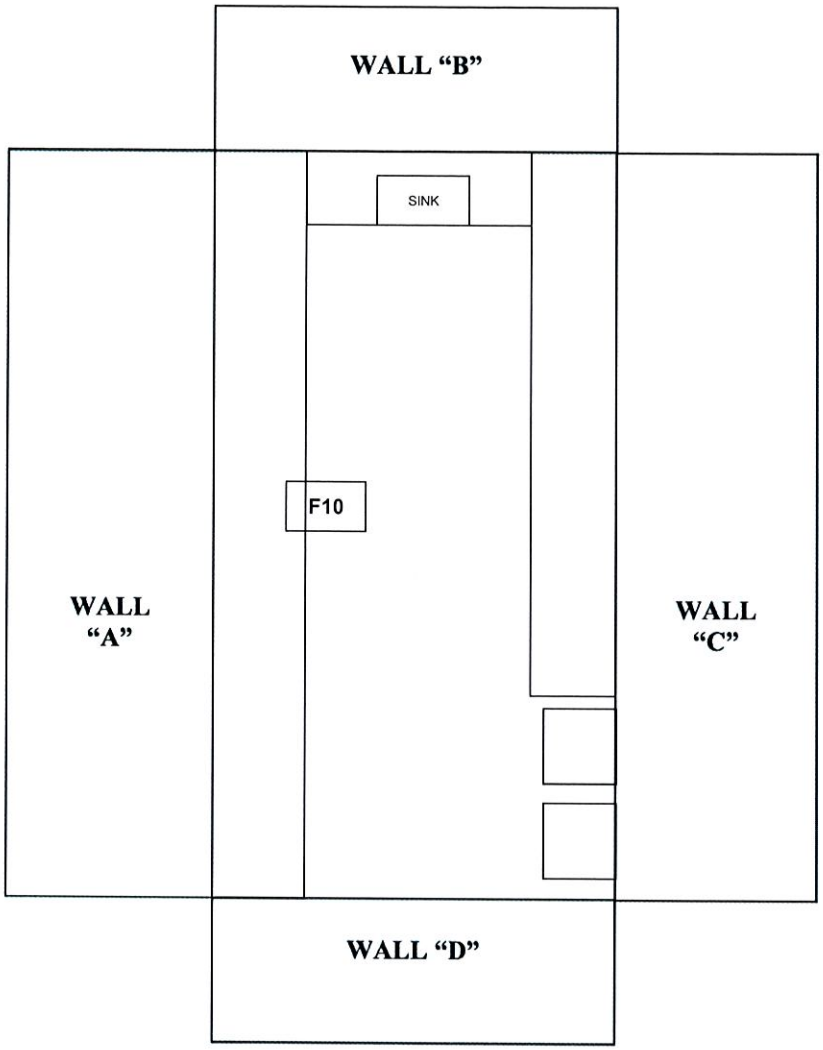
Grid "1" is determined by facing the subunit and is the first grid on the lower left

CLYM

MONITORING AND SURVEY FORM

Surveyor:	Date:
B. Pennington / L. Best	March 22, 2019
Client:	Location:
FDA GCSL	110

Area Diagram:



Comments:
Drawing not to scale.
"E" = Ceiling, "F" = Floor
Approximate size 200 ft^2

Meter information:

L2221 (#86286)
43-37 (#92501)
DOC: 2/7/2019

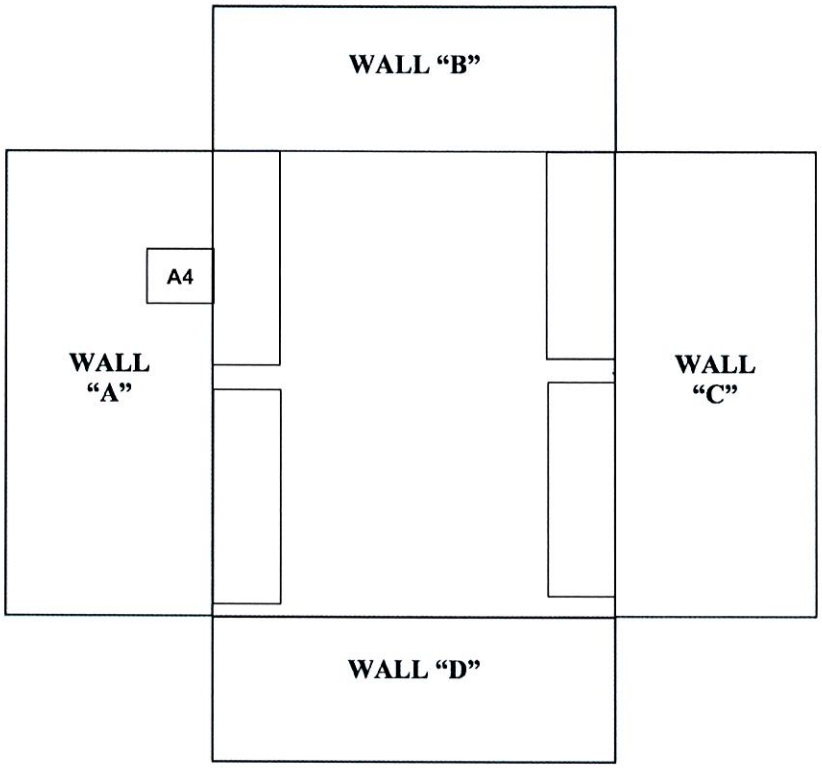
Note(s):

Final Status Point(s): F10
Matrix: Ceramic tile (Background 2118 cpm)
Static Measurement: 2315 cpm

Grid "1" is determined by facing the subunit and is the first grid on the lower left

CLYM	MONITORING AND SURVEY FORM	Surveyor: B. Pennington / L. Best	Date: March 21, 2019
		Client: FDA GCSL	Location: 111

Area Diagram:



Comments:
Drawing not to scale.
"E" = Ceiling, "F" = Floor
Approximate size 90 ft^2

Meter information:

L2221 (#86286)
43-37 (#92501)
DOC: 2/7/2019

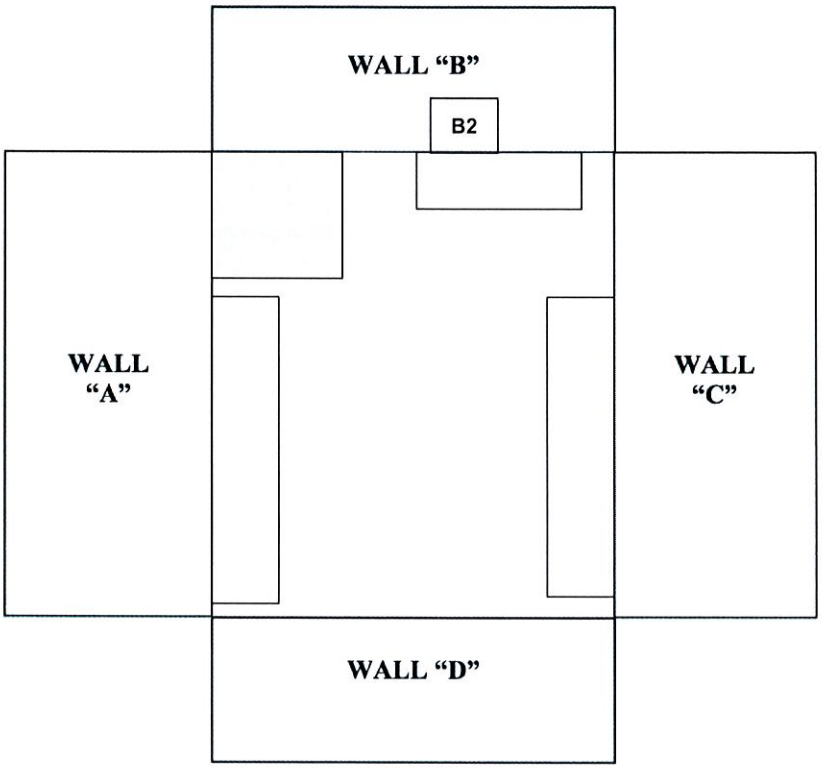
Note(s):

Final Status Point(s): A4
Matrix: Cinderblock (Background 554 cpm)
Static Measurement: 584 cpm

Grid "1" is determined by facing the subunit and is the first grid on the lower left

CLYM	MONITORING AND SURVEY FORM	Surveyor: B. Pennington / L. Best	Date: March 21, 2019
		Client: FDA GCSL	Location: 112

Area Diagram:



Comments:
Drawing not to scale.
"E" = Ceiling, "F" = Floor
Approximate size 96 ft^2

Meter information:

L2221 (#86286)
43-37 (#92501)
DOC: 2/7/2019

Note(s):

Final Status Point(s): B2
Matrix: Casework, metal (Background 592 cpm)
Static Measurement: 558 cpm

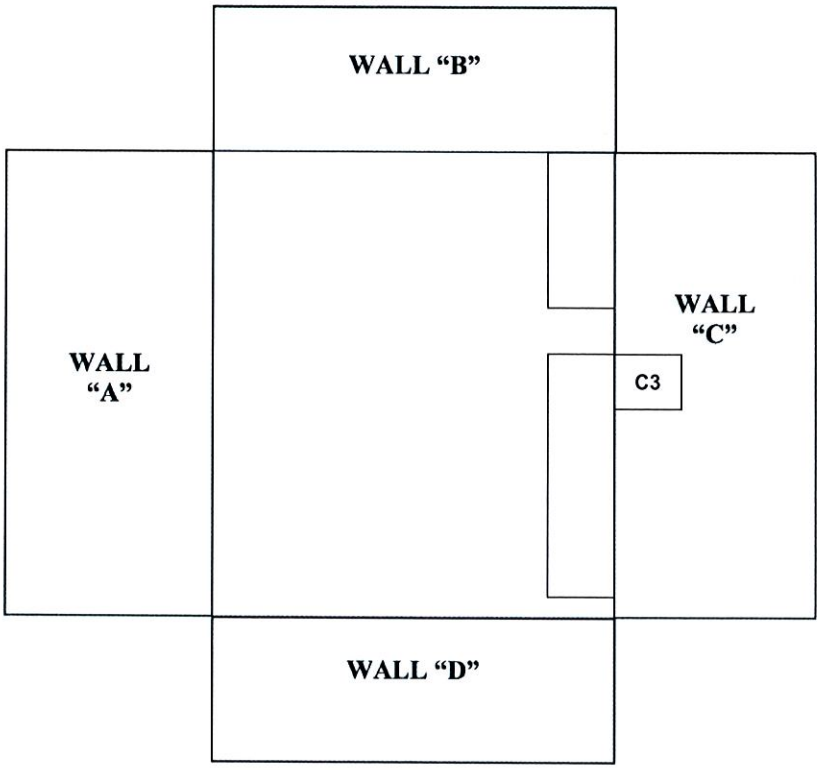
Grid "1" is determined by facing the subunit and is the first grid on the lower left

CLYM

MONITORING AND SURVEY FORM

Surveyor:	Date:
B. Pennington / L. Best	March 21, 2019
Client:	Location:
FDA GCSL	113

Area Diagram:



Comments:
Drawing not to scale.
"E" = Ceiling, "F" = Floor
Approximate size 90 ft^2

Meter information:

L2221 (#86286)
43-37 (#92501)
DOC: 2/7/2019

Note(s):

Final Status Point(s): C3
Matrix: Casework, metal (Background 592 cpm)
Static Measurement: 543 cpm

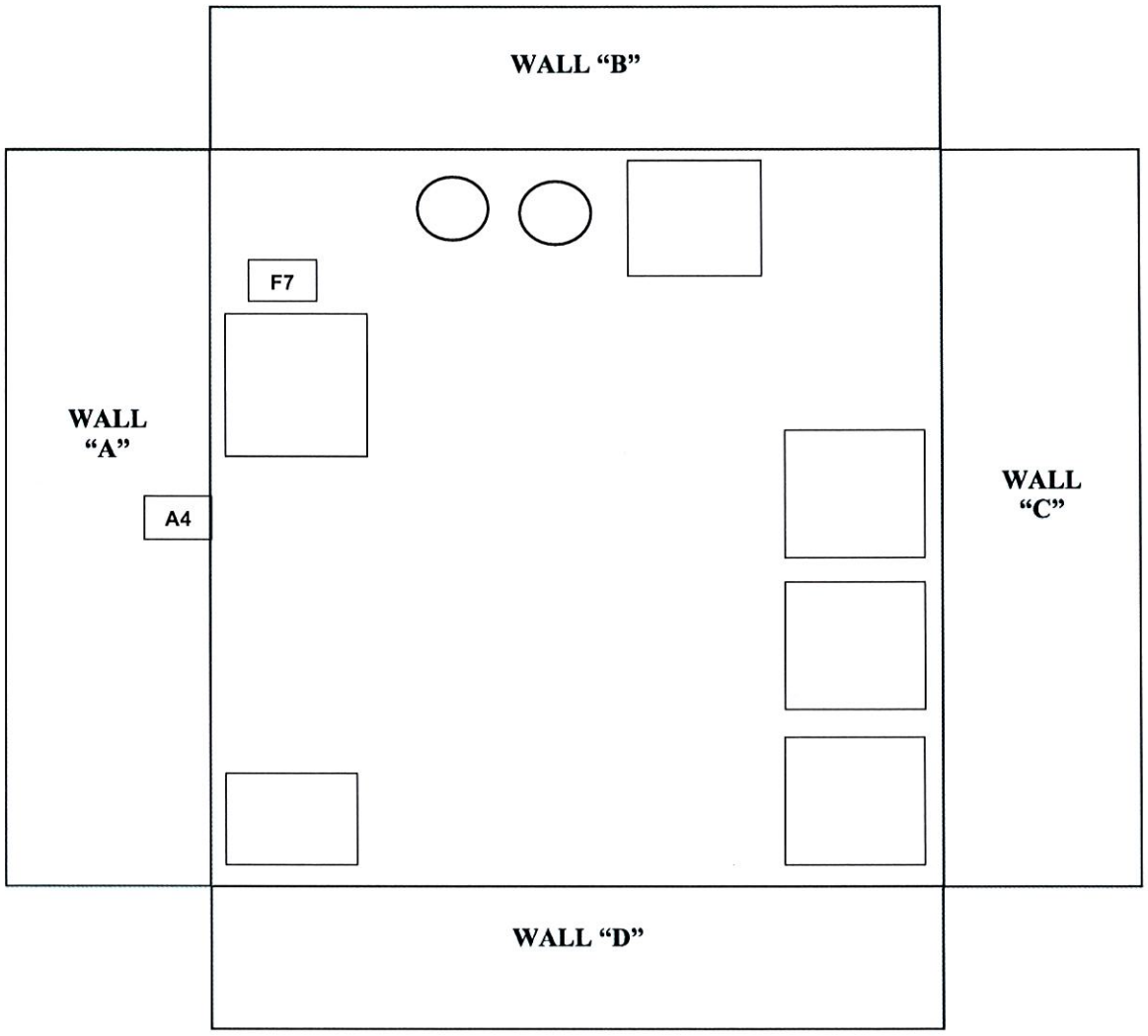
Grid "1" is determined by facing the subunit and is the first grid on the lower left

CLYM

MONITORING AND SURVEY FORM

Surveyor:	Date:
B. Pennington / L. Best	March 21, 2019
Client:	Location:
FDA GCSL	116 Loading Dock

Area Diagram:



Comments:
Drawing not to scale.
"E" = Ceiling, "F" = Floor
Approximate size 340 ft^2

Meter information:

L2221 (#86286)
43-37 (#92501)
DOC: 2/7/2019

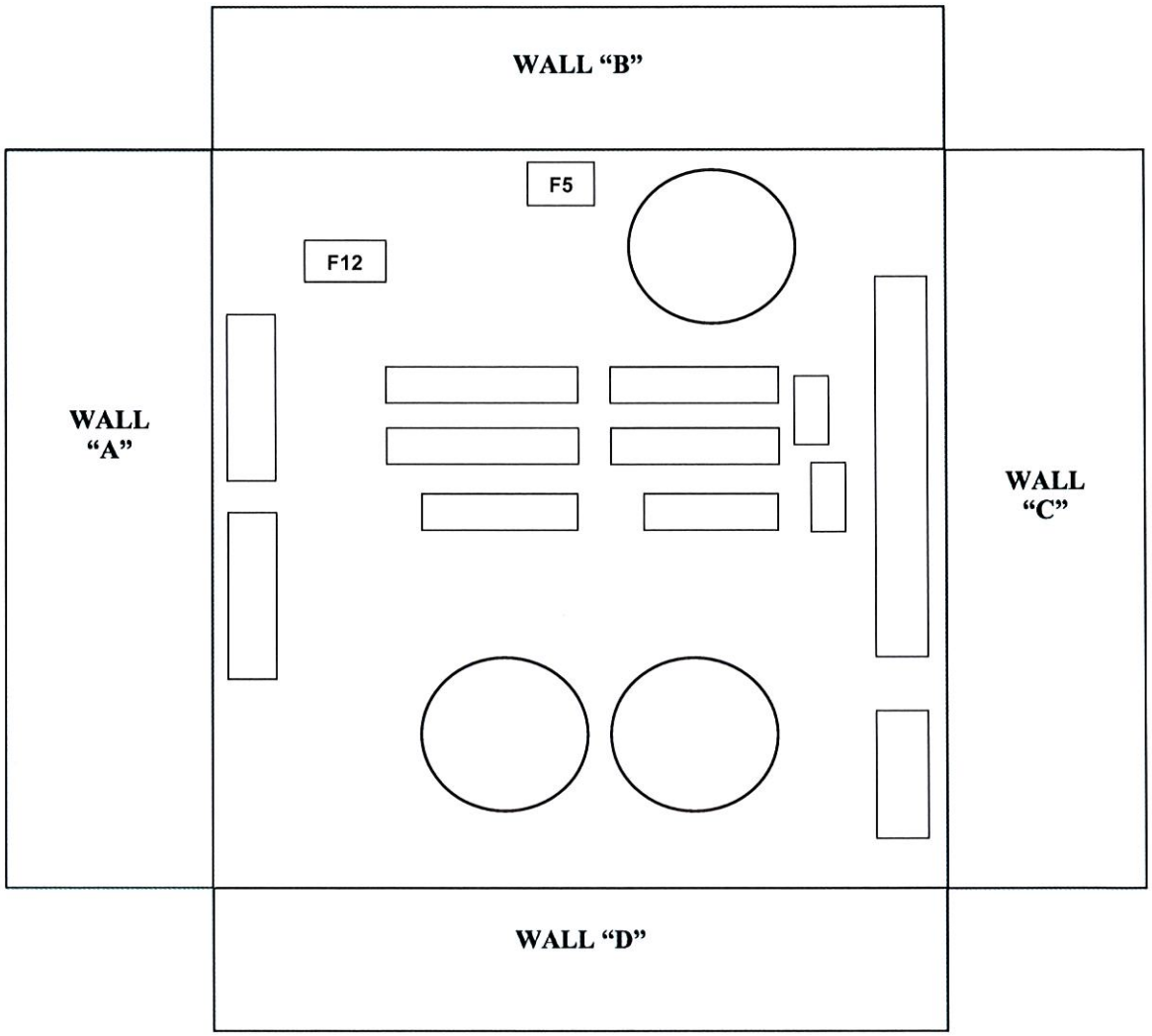
Note(s):

Final Status Point(s):	F7, A4
Matrix:	F7 Floor, vinyl (Background 806 cpm)
Static Measurement:	855 cpm
Matrix:	A4 Cinderblock (Background 554 cpm)
Static Measurement:	576 cpm

Grid "1" is determined by facing the subunit and is the first grid on the lower left

CLYM	MONITORING AND SURVEY FORM	Surveyor: B. Pennington / L. Best	Date: March 21, 2019
		Client: FDA GCSL	Location: 118

Area Diagram:



Comments:
Drawing not to scale.
"E" = Ceiling, "F" = Floor
Approximate size 725 ft^2

Meter information:

L2221 (#86286)
43-37 (#92501)
DOC: 2/7/2019

Note(s):

Final Status Point(s):	F12, F5
Matrix:	F12 Floor, acrylic (Background 993 cpm)
Static Measurement:	1001 cpm
Matrix:	F5 Floor, acrylic (Background 993 cpm)
Static Measurement:	966 cpm

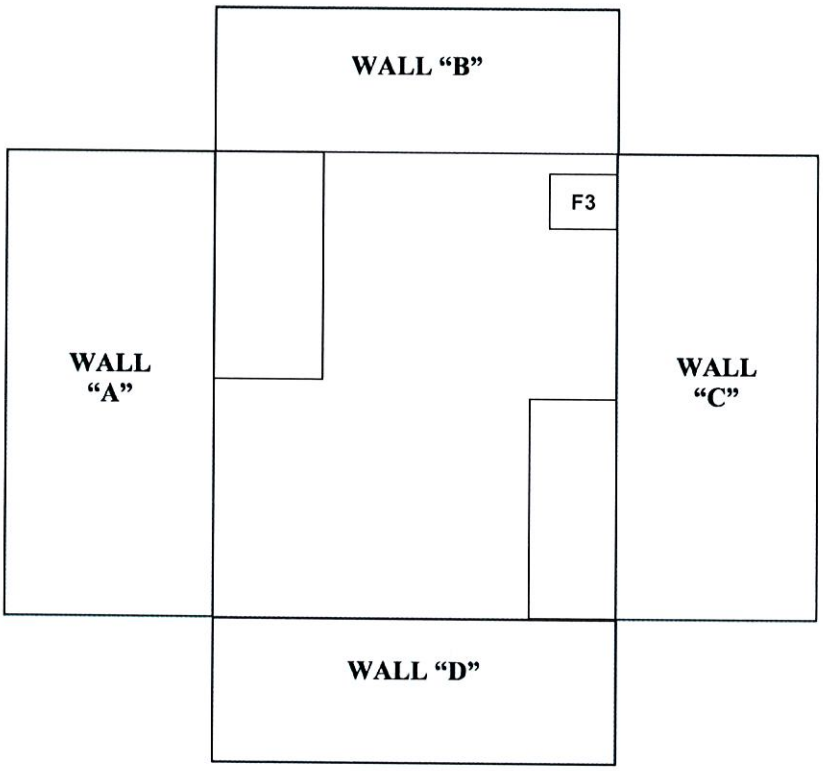
Grid "1" is determined by facing the subunit and is the first grid on the lower left

CLYM

MONITORING AND SURVEY FORM

Surveyor:	Date:
B. Pennington / L. Best	March 22, 2019
Client:	Location:
FDA GCSL	302 Waste Storage

Area Diagram:



Comments:
Drawing not to scale.
"E" = Ceiling, "F" = Floor
Approximate size 64 ft^2

Meter information:

L2221 (#86286)
43-37 (#92501)
DOC: 2/7/2019

Note(s):

Final Status Point(s): F3
Matrix: F3 Floor, acrylic (Background 993 cpm)
Static Measurement: 920 cpm

Grid "1" is determined by facing the subunit and is the first grid on the lower left

Attachment Three

Final Status Survey
Static Measurements

Final Status Survey

Static Measurement Results | **Scaler/Ratemeter:** L2221 #86286 | **Survey Date:** 3/23/19

14C DCGL = 3.7E6 DPM/100cm^2 | **Detector:** 43-37 (#92501) | **Detector Size:** 584 cm^2

Room	Grid	Matrix	Matrix Background	Static Result 1-Minute (GCPM)	Net CPM	DPM/100cm^2	Uncertainty*	Result
101	A6	Cinderblock, exterior	748	809	61	84	55.79	< DCGL
102	F7	Ceramic tile	2118	2142	24	33	90.79	< DCGL
103A	B3	Cinderblock, interior	554	593	39	54	47.77	< DCGL
103B	F6	Benchtop	853	870	17	23	57.86	< DCGL
104	F11	Ceramic tile	2118	2243	125	172	92.90	< DCGL
105A	F10	Floor, vinyl	806	780	-26	0	54.79	< DCGL
105B	F2	Floor, vinyl	806	760	-46	0	54.08	< DCGL
107A	F6	Benchtop	853	817	-36	0	56.07	< DCGL
109	F5	Cinderblock, exterior	748	733	-15	0	53.11	< DCGL
110	F10	Ceramic tile	2118	2315	197	271	94.38	< DCGL
111	A4	Cinderblock, interior	554	584	30	41	47.40	< DCGL
112	B2	Casework, metal	592	558	-34	0	46.34	< DCGL
113	C3	Casework, metal	592	543	-49	0	45.72	< DCGL
118	F12	Floor, acrylic	993	1001	8	11	62.06	< DCGL
118	F5	Floor, acrylic	993	966	-27	0	60.97	< DCGL
119	F5	Floor, acrylic	993	1045	52	71	63.41	< DCGL
302	F3	Floor, acrylic	993	920	-73	0	59.50	< DCGL

* Uncertainty calculated at the 95% Confidence Level

Attachment Four

Wipe Sample Results
Final Status Survey
and Scoping Surveys

FDA-GCSL Wipe Survey
Data Reduction Spreadsheet
(Final Status Survey)

Liquid Scintillation Counter Results
Beckman LS 6500 (S/N 7067666)
Run ID #BP19042916, Window 0-2000 keV
April 29, 2019

Sample ID	Sample Location	Background (cpm)	NCPM	Efficiency (3H)	Time (m)	MDA (dpm)	DPM/100cm²	Uncertainty (95%CL)
1	101 - A6 (Wall)	28	0	0.4693	4	27.8	0.00	7.77
2	102 - F7 (Floor)	28	0	0.4649	4	28.1	0.00	7.85
3	103A - B3 (Wall)	28	0	0.5177	4	25.2	0.00	7.05
4	103B - F6 (Bench)	28	0	0.5087	4	25.7	0.00	7.17
5	104 - F11 (Floor)	28	0	0.5077	4	25.7	0.00	7.19
6	105A - F10 (Floor)	28	0	0.5093	4	25.6	0.00	7.16
7	105B - F2 (Floor)	28	0	0.5441	4	24.0	0.00	6.70
8	107A - F6 (Bench)	28	0	0.5225	4	25.0	0.00	6.98
9	109 - F5 (Floor)	28	0	0.5185	4	25.2	0.00	7.04
10	110 - F10 (Floor)	28	0	0.5302	4	24.6	0.00	6.88
11	111 - A4 (Wall)	28	4.25	0.5291	4	24.7	8.03	7.15
12	112 - B2 (Casework)	28	0	0.5243	4	24.9	0.00	6.96
13	113 - C3 (Casework)	28	0	0.5112	4	25.5	0.00	7.14
14	118 - F12 (Floor)	28	0	0.5256	4	24.8	0.00	6.94
15	118 - F5 (Floor)	28	1.75	0.5369	4	24.3	3.26	6.90
16	119 - F5 (Floor)	28	0.25	0.5495	4	23.8	0.45	6.65
17	302 - F3 (Floor)	28	0	0.5249	4	24.9	0.00	6.95

FDA-GCSL Wipe Survey
Data Reduction Spreadsheet
(101 Scoping Survey)

Liquid Scintillation Counter Results
Beckman LS 6500 (S/N 7067666)
Run ID #BP1904291, Window 0-2000 keV
April 29, 2019

Sample ID	Sample Location	Background (cpm)	NCPM	Efficiency (3H)	Time (m)	MDA (dpm)	DPM/100cm²	Uncertainty (95%CL)
1	Floor	28	0	0.4979	4	26.2	0.00	7.33
2	Floor	28	0	0.7999	4	16.3	0.00	4.56
3	Floor	28	0	0.525	4	24.9	0.00	6.95
4	Floor	28	0	0.5383	4	24.2	0.00	6.78
5	Floor	28	0	0.5426	4	24.1	0.00	6.72
6	Floor	28	0	0.5428	4	24.0	0.00	6.72
7	Floor	28	0	0.5454	4	23.9	0.00	6.69
8	Floor	28	0	0.502	4	26.0	0.00	7.27
9	Floor	28	3.5	0.5407	4	24.1	6.47	6.95
10	Floor	28	0	0.4993	4	26.1	0.00	7.31
11	Floor	28	0	0.5255	4	24.8	0.00	6.94
12	Floor	28	0	0.519	4	25.1	0.00	7.03
13	Floor	28	1	0.541	4	24.1	1.85	6.80
14	Floor	28	1	0.4796	4	27.2	2.09	7.67
15	Wall A	28	2	0.5377	4	24.3	3.72	6.90
16	Wall A	28	0	0.5253	4	24.8	0.00	6.94
17	Wall A	28	0	0.5412	4	24.1	0.00	6.74
18	Wall A	28	0	0.5424	4	24.1	0.00	6.73
19	Wall A	28	0	0.5287	4	24.7	0.00	6.90
20	Wall A	28	0	0.543	4	24.0	0.00	6.72
21	Wall A	28	2.5	0.5462	4	23.9	4.58	6.83
22	Wall B	28	1.5	0.5409	4	24.1	2.77	6.83
23	Wall B	28	1.25	0.5208	4	25.1	2.40	7.08
24	Wall B	28	0	0.5202	4	25.1	0.00	7.01
25	Wall B	28	0	0.5242	4	24.9	0.00	6.96
26	Wall C	28	0	0.5363	4	24.3	0.00	6.80
27	Wall C	28	0	0.5123	4	25.5	0.00	7.12
28	Wall C	28	0	0.5309	4	24.6	0.00	6.87
29	Wall C	28	0	0.503	4	25.9	0.00	7.25
30	Wall C	28	0	0.5213	4	25.0	0.00	7.00

FDA-GCSL Wipe Survey
Data Reduction Spreadsheet
(101 Scoping Survey)

Liquid Scintillation Counter Results
Beckman LS 6500 (S/N 7067666)
Run ID #BP1904291, Window 0-2000 keV
April 29, 2019

Sample ID	Sample Location	Background (cpm)	NCPM	Efficiency (3H)	Time (m)	MDA (dpm)	DPM/100cm^2	Uncertainty (95%CL)
31	Wall C	28	3.75	0.5416	4	24.1	6.92	6.96
32	Wall C	28	0	0.513	4	25.4	0.00	7.11
33	Wall D	28	0	0.5478	4	23.8	0.00	6.66
34	Wall D	28	2.25	0.5434	4	24.0	4.14	6.85
35	Wall D	28	0	0.493	4	26.5	0.00	7.40
36	Wall D	28	0	0.5101	4	25.6	0.00	7.15
37	Upper Walls/Ceiling	28	0	0.504	4	25.9	0.00	7.24
38	Upper Walls/Ceiling	28	0	0.5273	4	24.8	0.00	6.92
39	Upper Walls/Ceiling	28	0	0.5389	4	24.2	0.00	6.77
40	Floor Drain	28	0	0.5251	4	24.9	0.00	6.95

FDA-GCSL Wipe Survey
Data Reduction Spreadsheet
(Final Status Survey)

Liquid Scintillation Counter Results
Beckman LS 6500 (S/N 7067666)
Run ID #BP19042916, Window 0-2000 keV
April 29, 2019

Sample ID	Sample Location	Background (cpm)	NCPM	Efficiency (3H)	Time (m)	MDA (dpm)	DPM/100cm²	Uncertainty (95%CL)
1	101 - A6 (Wall)	28	0	0.4693	4	27.8	0.00	7.77
2	102 - F7 (Floor)	28	0	0.4649	4	28.1	0.00	7.85
3	103A - B3 (Wall)	28	0	0.5177	4	25.2	0.00	7.05
4	103B - F6 (Bench)	28	0	0.5087	4	25.7	0.00	7.17
5	104 - F11 (Floor)	28	0	0.5077	4	25.7	0.00	7.19
6	105A - F10 (Floor)	28	0	0.5093	4	25.6	0.00	7.16
7	105B - F2 (Floor)	28	0	0.5441	4	24.0	0.00	6.70
8	107A - F6 (Bench)	28	0	0.5225	4	25.0	0.00	6.98
9	109 - F5 (Floor)	28	0	0.5185	4	25.2	0.00	7.04
10	110 - F10 (Floor)	28	0	0.5302	4	24.6	0.00	6.88
11	111 - A4 (Wall)	28	4.25	0.5291	4	24.7	8.03	7.15
12	112 - B2 (Casework)	28	0	0.5243	4	24.9	0.00	6.96
13	113 - C3 (Casework)	28	0	0.5112	4	25.5	0.00	7.14
14	118 - F12 (Floor)	28	0	0.5256	4	24.8	0.00	6.94
15	118 - F5 (Floor)	28	1.75	0.5369	4	24.3	3.26	6.90
16	119 - F5 (Floor)	28	0.25	0.5495	4	23.8	0.45	6.65
17	302 - F3 (Floor)	28	0	0.5249	4	24.9	0.00	6.95

FDA-GCSL Wipe Survey
Data Reduction Spreadsheet
(101 Scoping Survey)

Liquid Scintillation Counter Results
Beckman LS 6500 (S/N 7067666)
Run ID #BP1904291, Window 0-2000 keV
April 29, 2019

Sample ID	Sample Location	Background (cpm)	NCPM	Efficiency (3H)	Time (m)	MDA (dpm)	DPM/100cm²	Uncertainty (95%CL)
1	Floor	28	0	0.4979	4	26.2	0.00	7.33
2	Floor	28	0	0.7999	4	16.3	0.00	4.56
3	Floor	28	0	0.525	4	24.9	0.00	6.95
4	Floor	28	0	0.5383	4	24.2	0.00	6.78
5	Floor	28	0	0.5426	4	24.1	0.00	6.72
6	Floor	28	0	0.5428	4	24.0	0.00	6.72
7	Floor	28	0	0.5454	4	23.9	0.00	6.69
8	Floor	28	0	0.502	4	26.0	0.00	7.27
9	Floor	28	3.5	0.5407	4	24.1	6.47	6.95
10	Floor	28	0	0.4993	4	26.1	0.00	7.31
11	Floor	28	0	0.5255	4	24.8	0.00	6.94
12	Floor	28	0	0.519	4	25.1	0.00	7.03
13	Floor	28	1	0.541	4	24.1	1.85	6.80
14	Floor	28	1	0.4796	4	27.2	2.09	7.67
15	Wall A	28	2	0.5377	4	24.3	3.72	6.90
16	Wall A	28	0	0.5253	4	24.8	0.00	6.94
17	Wall A	28	0	0.5412	4	24.1	0.00	6.74
18	Wall A	28	0	0.5424	4	24.1	0.00	6.73
19	Wall A	28	0	0.5287	4	24.7	0.00	6.90
20	Wall A	28	0	0.543	4	24.0	0.00	6.72
21	Wall A	28	2.5	0.5462	4	23.9	4.58	6.83
22	Wall B	28	1.5	0.5409	4	24.1	2.77	6.83
23	Wall B	28	1.25	0.5208	4	25.1	2.40	7.08
24	Wall B	28	0	0.5202	4	25.1	0.00	7.01
25	Wall B	28	0	0.5242	4	24.9	0.00	6.96
26	Wall C	28	0	0.5363	4	24.3	0.00	6.80
27	Wall C	28	0	0.5123	4	25.5	0.00	7.12
28	Wall C	28	0	0.5309	4	24.6	0.00	6.87
29	Wall C	28	0	0.503	4	25.9	0.00	7.25
30	Wall C	28	0	0.5213	4	25.0	0.00	7.00

FDA-GCSL Wipe Survey
Data Reduction Spreadsheet
(101 Scoping Survey)

Liquid Scintillation Counter Results
Beckman LS 6500 (S/N 7067666)
Run ID #BP1904291, Window 0-2000 keV
April 29, 2019

Sample ID	Sample Location	Background (cpm)	NCPM	Efficiency (3H)	Time (m)	MDA (dpm)	DPM/100cm^2	Uncertainty (95%CL)
31	Wall C	28	3.75	0.5416	4	24.1	6.92	6.96
32	Wall C	28	0	0.513	4	25.4	0.00	7.11
33	Wall D	28	0	0.5478	4	23.8	0.00	6.66
34	Wall D	28	2.25	0.5434	4	24.0	4.14	6.85
35	Wall D	28	0	0.493	4	26.5	0.00	7.40
36	Wall D	28	0	0.5101	4	25.6	0.00	7.15
37	Upper Walls/Ceiling	28	0	0.504	4	25.9	0.00	7.24
38	Upper Walls/Ceiling	28	0	0.5273	4	24.8	0.00	6.92
39	Upper Walls/Ceiling	28	0	0.5389	4	24.2	0.00	6.77
40	Floor Drain	28	0	0.5251	4	24.9	0.00	6.95

FDA-GCSL Wipe Survey
Data Reduction Spreadsheet
(102 Scoping Survey)

Liquid Scintillation Counter Results
Beckman LS 6500 (S/N 7067666)
Run ID #BP1904292, Window 0-2000 keV
April 29, 2019

Sample ID	Sample Location	Background (cpm)	NCPM	Efficiency (3H)	Time (m)	MDA (dpm)	DPM/100cm^2	Uncertainty (95%CL)
1	Floor	28	0	0.4452	4	29.3	0.00	8.19
2	Floor	28	0.25	0.4269	4	30.6	0.59	8.56
3	Floor	28	0	0.455	4	28.7	0.00	8.02
4	Floor	28	0	0.4576	4	28.5	0.00	7.97
5	Floor	28	0	0.4283	4	30.5	0.00	8.52
6	Floor	28	0	0.4184	4	31.2	0.00	8.72
7	Floor	28	0	0.4059	4	32.2	0.00	8.99
8	Floor	28	0	0.3891	4	33.5	0.00	9.38
9	Floor	28	1.25	0.4478	4	29.1	2.79	8.24
10	Floor	28	3.25	0.4825	4	27.1	6.74	7.78
11	Floor	28	0	0.4311	4	30.3	0.00	8.46
12	Floor	28	0	0.4494	4	29.0	0.00	8.12
13	Floor	28	0	0.4513	4	28.9	0.00	8.08
14	Floor	28	0	0.4729	4	27.6	0.00	7.71
15	Wall A	28	0	0.5023	4	26.0	0.00	7.26
16	Wall A	28	0.5	0.4776	4	27.3	1.05	7.67
17	Wall A	28	0	0.4992	4	26.1	0.00	7.31
18	Wall A	28	0	0.4903	4	26.6	0.00	7.44
19	Wall A	28	0	0.4937	4	26.4	0.00	7.39
20	Wall A	28	0	0.477	4	27.4	0.00	7.65
21	Wall A	28	0	0.4997	4	26.1	0.00	7.30
22	Wall B	28	0.25	0.5172	4	25.2	0.48	7.07
23	Wall B	28	0	0.495	4	26.4	0.00	7.37
24	Wall B	28	0	0.5042	4	25.9	0.00	7.24
25	Wall B	28	2.25	0.5102	4	25.6	4.41	7.29
26	Wall C	28	0	0.503	4	25.9	0.00	7.25
27	Wall C	28	0	0.5101	4	25.6	0.00	7.15

FDA-GCSL Wipe Survey
Data Reduction Spreadsheet
(102 Scoping Survey)

Liquid Scintillation Counter Results
Beckman LS 6500 (S/N 7067666)
Run ID #BP1904292, Window 0-2000 keV
April 29, 2019

Sample ID	Sample Location	Background (cpm)	NCPM	Efficiency (3H)	Time (m)	MDA (dpm)	DPM/100cm^2	Uncertainty (95%CL)
28	Wall C	28	0	0.4962	4	26.3	0.00	7.35
29	Wall C	28	0	0.5019	4	26.0	0.00	7.27
30	Wall C	28	0	0.5347	4	24.4	0.00	6.82
31	Wall C	28	0	0.5016	4	26.0	0.00	7.27
32	Wall C	28	0	0.5068	4	25.8	0.00	7.20
33	Wall D	28	0	0.5315	4	24.6	0.00	6.86
34	Wall D	28	0	0.5453	4	23.9	0.00	6.69
35	Wall D	28	0	0.5172	4	25.2	0.00	7.05
36	Wall D	28	0	0.5195	4	25.1	0.00	7.02
37	Upper Walls/Ceiling	28	0	0.5222	4	25.0	0.00	6.99
38	Upper Walls/Ceiling	28	0	0.5238	4	24.9	0.00	6.96
39	Upper Walls/Ceiling	28	0	0.5229	4	25.0	0.00	6.98
40	Bench A - Benchtop	28	1	0.5262	4	24.8	1.90	6.99
41	Benchtop	28	0	0.4971	4	26.3	0.00	7.34
42	Benchtop	28	0	0.5021	4	26.0	0.00	7.27
43	Benchtop	28	0	0.5274	4	24.7	0.00	6.92
44	Benchtop	28	0	0.5229	4	25.0	0.00	6.98
45	Benchtop	28	0	0.5396	4	24.2	0.00	6.76
46	Benchtop	28	1.5	0.5376	4	24.3	2.79	6.88
47	Drawers	28	0	0.5215	4	25.0	0.00	7.00
48	Drawers	28	0	0.5192	4	25.1	0.00	7.03
49	Drawers	28	0	0.4939	4	26.4	0.00	7.39
50	Drawers	28	0	0.5072	4	25.7	0.00	7.19
51	Drawers	28	0	0.5395	4	24.2	0.00	6.76
52	Drawers	28	0	0.5323	4	24.5	0.00	6.85
53	Drawers	28	0	0.5011	4	26.0	0.00	7.28
54	Shelf	28	0	0.5077	4	25.7	0.00	7.19
55	Shelf	28	0	0.5447	4	24.0	0.00	6.70
56	Shelf	28	0.5	0.4948	4	26.4	1.01	7.41

FDA-GCSL Wipe Survey
Data Reduction Spreadsheet
(102 Scoping Survey)

Liquid Scintillation Counter Results
Beckman LS 6500 (S/N 7067666)
Run ID #BP1904292, Window 0-2000 keV
April 29, 2019

Sample ID	Sample Location	Background (cpm)	NCPM	Efficiency (3H)	Time (m)	MDA (dpm)	DPM/100cm^2	Uncertainty (95%CL)
57	Shelf	28	0	0.495	4	26.4	0.00	7.37
58	Sink	28	0.75	0.4962	4	26.3	1.51	7.40
59	Sink drain	28	0	0.4596	4	28.4	0.00	7.94
60	Bench B - Benchtop	28	0	0.5214	4	25.0	0.00	7.00
61	Benchtop	28	1.25	0.5042	4	25.9	2.48	7.32
62	Drawers	28	0	0.4872	4	26.8	0.00	7.49
63	Drawers	28	0.75	0.4484	4	29.1	1.67	8.19
64	Bench C - Benchtop	28	0.25	0.4928	4	26.5	0.51	7.42
65	Benchtop	28	0	0.5131	4	25.4	0.00	7.11
66	Benchtop	28	0	0.5091	4	25.6	0.00	7.17
67	Drawers	28	0	0.515	4	25.3	0.00	7.08
68	Drawers	28	0	0.5454	4	23.9	0.00	6.69
69	Drawers	28	0	0.5245	4	24.9	0.00	6.96
70	Shelf	28	1.75	0.5221	4	25.0	3.35	7.10
71	Shelf	28	0	0.5184	4	25.2	0.00	7.04

FDA-GCSL Wipe Survey
Data Reduction Spreadsheet
(103 A&B Scoping Survey)

Liquid Scintillation Counter Results
Beckman LS 6500 (S/N 7067666)
Run ID #BP1905021, Window 0-2000 keV
May 2, 2019

Sample ID	Sample Location	Background (cpm)	NCPM	Efficiency (3H)	Time (m)	MDA (dpm)	DPM/100cm²	Uncertainty (95%CL)
1	103A - Floor	28	1.25	0.539	4	24.2	2.32	6.84
2	Floor	28	0	0.5257	4	24.8	0.00	6.94
3	Floor	28	0	0.5394	4	24.2	0.00	6.76
4	Floor	28	0	0.5437	4	24.0	0.00	6.71
5	Floor	28	0	0.5358	4	24.4	0.00	6.81
6	Floor	28	0.5	0.5187	4	25.2	0.96	7.06
7	Floor	28	1.25	0.5277	4	24.7	2.37	6.99
8	Floor	28	0	0.5475	4	23.8	0.00	6.66
9	Floor	28	1.25	0.5331	4	24.5	2.34	6.92
10	Floor	28	0	0.5279	4	24.7	0.00	6.91
11	Floor	28	0	0.5287	4	24.7	0.00	6.90
12	Floor	28	0	0.5354	4	24.4	0.00	6.81
13	Floor	28	0	0.5388	4	24.2	0.00	6.77
14	Floor	28	0	0.5296	4	24.6	0.00	6.89
15	Wall A	28	0	0.5375	4	24.3	0.00	6.79
16	Wall A	28	0	0.513	4	25.4	0.00	7.11
17	Wall A	28	0	0.5376	4	24.3	0.00	6.79
18	Wall A	28	0	0.5393	4	24.2	0.00	6.76
19	Wall B	28	0	0.5314	4	24.6	0.00	6.87
20	Wall B	28	0.25	0.5356	4	24.4	0.47	6.83
21	Wall B	28	0	0.5352	4	24.4	0.00	6.82
22	Wall B	28	0	0.5397	4	24.2	0.00	6.76
23	Wall B	28	0	0.5407	4	24.1	0.00	6.75
24	Wall B	28	0	0.5374	4	24.3	0.00	6.79
25	Wall B	28	0	0.5422	4	24.1	0.00	6.73
26	Wall C	28	0	0.524	4	24.9	0.00	6.96
27	Wall C	28	0.5	0.5298	4	24.6	0.94	6.92

FDA-GCSL Wipe Survey
Data Reduction Spreadsheet
(103 A&B Scoping Survey)

Liquid Scintillation Counter Results
Beckman LS 6500 (S/N 7067666)
Run ID #BP1905021, Window 0-2000 keV
May 2, 2019

Sample ID	Sample Location	Background (cpm)	NCPM	Efficiency (3H)	Time (m)	MDA (dpm)	DPM/100cm²	Uncertainty (95%CL)
28	Wall C	28	1.25	0.5343	4	24.4	2.34	6.90
29	Wall C	28	0	0.5128	4	25.5	0.00	7.11
30	Wall D	28	0	0.5392	4	24.2	0.00	6.77
31	Wall D	28	0	0.5332	4	24.5	0.00	6.84
32	Wall D	28	0	0.5393	4	24.2	0.00	6.76
33	Wall D	28	0	0.539	4	24.2	0.00	6.77
34	Wall D	28	0	0.5168	4	25.3	0.00	7.06
35	Wall D	28	0	0.5433	4	24.0	0.00	6.71
36	Wall D	28	0	0.5278	4	24.7	0.00	6.91
37	Upper Walls / Ceiling	28	2.25	0.5301	4	24.6	4.24	7.02
38	Upper Walls / Ceiling	28	0	0.5411	4	24.1	0.00	6.74
39	Upper Walls / Ceiling	28	0	0.5139	4	25.4	0.00	7.10
40	Shelves	28	0	0.5311	4	24.6	0.00	6.87
41	Shelves	28	0	0.5295	4	24.7	0.00	6.89
42	Shelves	28	1	0.5395	4	24.2	1.85	6.82
43	103B - Floor	28	1	0.5429	4	24.0	1.84	6.78
44	Floor	28	0.5	0.5274	4	24.7	0.95	6.95
45	Floor	28	0	0.5209	4	25.1	0.00	7.00
46	Floor	28	0	0.5365	4	24.3	0.00	6.80
47	Floor	28	0	0.5426	4	24.1	0.00	6.72
48	Floor	28	0	0.5122	4	25.5	0.00	7.12
49	Floor	28	0	0.5065	4	25.8	0.00	7.20
50	Floor	28	0	0.5185	4	25.2	0.00	7.04
51	Floor	28	1.75	0.5405	4	24.1	3.24	6.85
52	Floor	28	0	0.5264	4	24.8	0.00	6.93
53	Floor	28	0.5	0.5392	4	24.2	0.93	6.80
54	Floor	28	0	0.5138	4	25.4	0.00	7.10
55	Floor	28	0	0.5295	4	24.7	0.00	6.89
56	Floor	28	0	0.5317	4	24.5	0.00	6.86

FDA-GCSL Wipe Survey
Data Reduction Spreadsheet
(103 A&B Scoping Survey)

Liquid Scintillation Counter Results
Beckman LS 6500 (S/N 7067666)
Run ID #BP1905021, Window 0-2000 keV
May 2, 2019

Sample ID	Sample Location	Background (cpm)	NCPM	Efficiency (3H)	Time (m)	MDA (dpm)	DPM/100cm²	Uncertainty (95%CL)
57	Wall A	28	3.25	0.5385	4	24.2	6.04	6.97
58	Wall A	28	0	0.5382	4	24.3	0.00	6.78
59	Wall A	28	0	0.5414	4	24.1	0.00	6.74
60	Wall A	28	0	0.5271	4	24.8	0.00	6.92
61	Wall B	28	0	0.5311	4	24.6	0.00	6.87
62	Wall B	28	0	0.5363	4	24.3	0.00	6.80
63	Wall B	28	0	0.5163	4	25.3	0.00	7.07
64	Wall B	28	0	0.5275	4	24.7	0.00	6.92
65	Wall B	28	0	0.5382	4	24.3	0.00	6.78
66	Wall B	28	0	0.541	4	24.1	0.00	6.74
67	Wall B	28	0.25	0.5445	4	24.0	0.46	6.71
68	Wall C	28	0	0.5347	4	24.4	0.00	6.82
69	Wall C	28	0.25	0.5122	4	25.5	0.49	7.14
70	Wall C	28	1.5	0.5445	4	24.0	2.75	6.79
71	Wall C	28	0	0.5283	4	24.7	0.00	6.91
72	Wall D	28	0	0.5258	4	24.8	0.00	6.94
73	Wall D	28	0	0.5344	4	24.4	0.00	6.83
74	Wall D	28	0	0.5167	4	25.3	0.00	7.06
75	Wall D	28	0	0.5396	4	24.2	0.00	6.76
76	Wall D	28	0	0.5362	4	24.3	0.00	6.80
77	Wall D	28	0	0.5398	4	24.2	0.00	6.76
78	Wall D	28	0	0.5451	4	23.9	0.00	6.69
79	Upper Walls / Ceiling	28	0	0.5156	4	25.3	0.00	7.08
80	Upper Walls / Ceiling	28	0	0.5318	4	24.5	0.00	6.86
81	Upper Walls / Ceiling	28	0	0.5023	4	26.0	0.00	7.26
82	Upper Walls / Ceiling	28	0	0.5287	4	24.7	0.00	6.90
83	Wall A Benchtop	28	3.25	0.5361	4	24.3	6.06	7.00
84	Benchtop	28	0	0.5193	4	25.1	0.00	7.03
85	Benchtop	28	0	0.5155	4	25.3	0.00	7.08

FDA-GCSL Wipe Survey
Data Reduction Spreadsheet
(103 A&B Scoping Survey)

Liquid Scintillation Counter Results
Beckman LS 6500 (S/N 7067666)
Run ID #BP1905021, Window 0-2000 keV
May 2, 2019

Sample ID	Sample Location	Background (cpm)	NCPM	Efficiency (3H)	Time (m)	MDA (dpm)	DPM/100cm²	Uncertainty (95%CL)
86	Drawers	28	2	0.509	4	25.6	3.93	7.29
87	Drawers	28	0	0.4826	4	27.0	0.00	7.56
88	Drawers	28	0	0.5364	4	24.3	0.00	6.80
89	Shelves	28	1.5	0.5322	4	24.5	2.82	6.95
90	Shelves	28	0	0.5344	4	24.4	0.00	6.83
91	Shelves	28	0	0.5451	4	23.9	0.00	6.69
92	Sink	28	0	0.5109	4	25.5	0.00	7.14
93	Sink drain	28	0	0.5006	4	26.1	0.00	7.29
94	Wall B Benchtop	28	0	0.5243	4	24.9	0.00	6.96
95	Benchtop	28	0	0.5128	4	25.5	0.00	7.11
96	Benchtop	28	4.5	0.5325	4	24.5	8.45	7.12
97	Benchtop	28	0	0.525	4	24.9	0.00	6.95
98	Benchtop	28	0.25	0.5126	4	25.5	0.49	7.13
99	Benchtop	28	0	0.5342	4	24.4	0.00	6.83
100	Benchtop	28	0	0.5267	4	24.8	0.00	6.93
101	Drawers	28	0	0.5252	4	24.9	0.00	6.95
102	Drawers	28	0	0.5327	4	24.5	0.00	6.85
103	Drawers	28	0	0.5368	4	24.3	0.00	6.80
104	Drawers	28	2.25	0.5285	4	24.7	4.26	7.04
105	Drawers	28	0	0.5311	4	24.6	0.00	6.87
106	Shelves	28	0.25	0.5297	4	24.6	0.47	6.90
107	Shelves	28	0	0.5123	4	25.5	0.00	7.12
108	Shelves	28	1.5	0.5422	4	24.1	2.77	6.82
109	Shelves	28	2	0.5371	4	24.3	3.72	6.91
110	Hood	28	0	0.5431	4	24.0	0.00	6.72
111	Hood	28	0	0.5215	4	25.0	0.00	7.00
112	Hood	28	0	0.5388	4	24.2	0.00	6.77
113	Hood	28	0	0.5254	4	24.8	0.00	6.94
114	Hood	28	0	0.538	4	24.3	0.00	6.78

FDA-GCSL Wipe Survey
Data Reduction Spreadsheet
(104 Scoping Survey)

Liquid Scintillation Counter Results
Beckman LS 6500 (S/N 7067666)
Run ID #BP1904301, Window 0-2000 keV
May 1, 2019

Sample ID	Sample Location	Background (cpm)	NCPM	Efficiency (3H)	Time (m)	MDA (dpm)	DPM/100cm^2	Uncertainty (95%CL)
1	Floor	28	0	0.5061	4	25.8	0.00	7.21
2	Floor	28	0	0.497	4	26.3	0.00	7.34
3	Floor	28	0	0.5308	4	24.6	0.00	6.87
4	Floor	28	0	0.5459	4	23.9	0.00	6.68
5	Floor	28	0	0.5436	4	24.0	0.00	6.71
6	Floor	28	0	0.5189	4	25.2	0.00	7.03
7	Floor	28	2.5	0.5101	4	25.6	4.90	7.31
8	Floor	28	0	0.5176	4	25.2	0.00	7.05
9	Floor	28	1.75	0.5243	4	24.9	3.34	7.07
10	Floor	28	0	0.5196	4	25.1	0.00	7.02
11	Floor	28	0	0.5329	4	24.5	0.00	6.85
12	Floor	28	0	0.5211	4	25.0	0.00	7.00
13	Floor	28	0	0.5028	4	26.0	0.00	7.26
14	Floor	28	0	0.5183	4	25.2	0.00	7.04
15	Floor	28	0	0.5284	4	24.7	0.00	6.90
16	Floor	28	0.5	0.5372	4	24.3	0.93	6.82
17	Floor	28	0	0.5425	4	24.1	0.00	6.72
18	Floor	28	0	0.5381	4	24.3	0.00	6.78
19	Floor	28	0	0.4769	4	27.4	0.00	7.65
20	Floor	28	0	0.5044	4	25.9	0.00	7.23
21	Floor	28	0	0.4865	4	26.8	0.00	7.50
22	Floor	28	0	0.5307	4	24.6	0.00	6.87
23	Floor	28	2	0.5404	4	24.2	3.70	6.87
24	Floor	28	0	0.5369	4	24.3	0.00	6.79
25	Floor	28	0	0.5216	4	25.0	0.00	6.99
26	Wall A	28	0	0.4994	4	26.1	0.00	7.30
27	Wall A	28	0	0.5388	4	24.2	0.00	6.77

FDA-GCSL Wipe Survey
Data Reduction Spreadsheet
(104 Scoping Survey)

Liquid Scintillation Counter Results
Beckman LS 6500 (S/N 7067666)
Run ID #BP1904301, Window 0-2000 keV
May 1, 2019

Sample ID	Sample Location	Background (cpm)	NCPM	Efficiency (3H)	Time (m)	MDA (dpm)	DPM/100cm^2	Uncertainty (95%CL)
28	Wall A	28	0	0.5368	4	24.3	0.00	6.80
29	Wall A	28	0	0.5067	4	25.8	0.00	7.20
30	Wall A	28	0	0.526	4	24.8	0.00	6.94
31	Wall A	28	2.75	0.5272	4	24.8	5.22	7.09
32	Wall A	28	0	0.5414	4	24.1	0.00	6.74
33	Wall B	28	0	0.5136	4	25.4	0.00	7.10
34	Wall B	28	0	0.5138	4	25.4	0.00	7.10
35	Wall B	28	0	0.5157	4	25.3	0.00	7.07
36	Wall B	28	0	0.5313	4	24.6	0.00	6.87
37	Wall B	28	0	0.54	4	24.2	0.00	6.76
38	Wall B	28	1	0.5432	4	24.0	1.84	6.78
39	Wall B	28	0	0.5408	4	24.1	0.00	6.75
40	Wall C	28	0	0.5262	4	24.8	0.00	6.93
41	Wall C	28	0	0.5441	4	24.0	0.00	6.70
42	Wall C	28	0	0.5368	4	24.3	0.00	6.80
43	Wall C	28	1	0.5344	4	24.4	1.87	6.89
44	Wall C	28	0	0.5277	4	24.7	0.00	6.91
45	Wall C	28	0	0.4777	4	27.3	0.00	7.64
46	Wall C	28	0	0.5076	4	25.7	0.00	7.19
47	Wall D	28	0	0.5078	4	25.7	0.00	7.18
48	Wall D	28	0	0.5317	4	24.5	0.00	6.86
49	Wall D	28	0	0.545	4	23.9	0.00	6.69
50	Wall D	28	0	0.5163	4	25.3	0.00	7.07
51	Wall D	28	0	0.5433	4	24.0	0.00	6.71
52	Wall D	28	0	0.5419	4	24.1	0.00	6.73
53	Wall D	28	0	0.5315	4	24.6	0.00	6.86
54	Upper Walls / Ceiling	28	0	0.5265	4	24.8	0.00	6.93
55	Upper Walls / Ceiling	28	0	0.5408	4	24.1	0.00	6.75
56	Upper Walls / Ceiling	28	0	0.5187	4	25.2	0.00	7.03

FDA-GCSL Wipe Survey
Data Reduction Spreadsheet
(104 Scoping Survey)

Liquid Scintillation Counter Results
Beckman LS 6500 (S/N 7067666)
Run ID #BP1904301, Window 0-2000 keV
May 1, 2019

Sample ID	Sample Location	Background (cpm)	NCPM	Efficiency (3H)	Time (m)	MDA (dpm)	DPM/100cm^2	Uncertainty (95%CL)
57	Upper Walls / Ceiling	28	0	0.5482	4	23.8	0.00	6.65
58	Upper Walls / Ceiling	28	0	0.5494	4	23.8	0.00	6.64
59	Wall A - BSC	28	0	0.543	4	24.0	0.00	6.72
60	BSC	28	0	0.5405	4	24.1	0.00	6.75
61	BSC	28	0	0.5456	4	23.9	0.00	6.69
62	BSC	28	0	0.5488	4	23.8	0.00	6.65
63	BSC	28	3.25	0.5374	4	24.3	6.05	6.98
64	Shelf	28	0	0.5344	4	24.4	0.00	6.83
65	Wall B - Benchtop	28	0	0.5318	4	24.5	0.00	6.86
66	Benchtop	28	0	0.4987	4	26.2	0.00	7.32
67	Benchtop	28	0	0.5132	4	25.4	0.00	7.11
68	Benchtop	28	0	0.5195	4	25.1	0.00	7.02
69	Benchtop	28	3.25	0.5224	4	25.0	6.22	7.18
70	Benchtop	28	0.5	0.5108	4	25.6	0.98	7.17
71	Drawers	28	0	0.5379	4	24.3	0.00	6.78
72	Drawers	28	0	0.5258	4	24.8	0.00	6.94
73	Drawers	28	0	0.5205	4	25.1	0.00	7.01
74	Drawers	28	0	0.5328	4	24.5	0.00	6.85
75	Drawers	28	0	0.5334	4	24.5	0.00	6.84
76	Drawers	28	0	0.5026	4	26.0	0.00	7.26
77	Wall C - Benchtop	28	0	0.5108	4	25.6	0.00	7.14
78	Benchtop	28	0	0.5315	4	24.6	0.00	6.86
79	Benchtop	28	1	0.5441	4	24.0	1.84	6.76
80	Benchtop	28	0	0.5418	4	24.1	0.00	6.73
81	Benchtop	28	0	0.5246	4	24.9	0.00	6.95
82	Drawers	28	0	0.5102	4	25.6	0.00	7.15
83	Drawers	28	0	0.5395	4	24.2	0.00	6.76
84	Drawers	28	2.25	0.5355	4	24.4	4.20	6.95
85	Drawers	28	0	0.531	4	24.6	0.00	6.87

FDA-GCSL Wipe Survey
Data Reduction Spreadsheet
(104 Scoping Survey)

Liquid Scintillation Counter Results
Beckman LS 6500 (S/N 7067666)
Run ID #BP1904301, Window 0-2000 keV
May 1, 2019

Sample ID	Sample Location	Background (cpm)	NCPM	Efficiency (3H)	Time (m)	MDA (dpm)	DPM/100cm^2	Uncertainty (95%CL)
86	Drawers	28	0	0.543	4	24.0	0.00	6.72
87	Shelf	28	0	0.5431	4	24.0	0.00	6.72
88	Shelf	28	0	0.5397	4	24.2	0.00	6.76
89	Shelf	28	0	0.52	4	25.1	0.00	7.02
90	Shelf	28	0	0.5424	4	24.1	0.00	6.73
91	Sink	28	0	0.5351	4	24.4	0.00	6.82
92	Sink drain	28	0	0.5152	4	25.3	0.00	7.08
93	Wall D - Benchtop	28	0	0.5425	4	24.1	0.00	6.72
94	Benchtop	28	0	0.5374	4	24.3	0.00	6.79
95	Benchtop	28	0	0.5425	4	24.1	0.00	6.72
96	Benchtop	28	0	0.5387	4	24.2	0.00	6.77
97	Benchtop	28	1.5	0.5097	4	25.6	2.94	7.25
98	Benchtop	28	0	0.5169	4	25.3	0.00	7.06
99	Drawers	28	0.5	0.5386	4	24.2	0.93	6.80
100	Drawers	28	0	0.5356	4	24.4	0.00	6.81
101	Drawers	28	0	0.5154	4	25.3	0.00	7.08
102	Drawers	28	0	0.5454	4	23.9	0.00	6.69
103	Drawers	28	0	0.5003	4	26.1	0.00	7.29
104	Drawers	28	0	0.5386	4	24.2	0.00	6.77
105	Shelf	28	0	0.5422	4	24.1	0.00	6.73
106	Shelf	28	0	0.546	4	23.9	0.00	6.68
107	Shelf	28	0	0.5417	4	24.1	0.00	6.73
108	Shelf	28	0	0.5419	4	24.1	0.00	6.73
109	Shelf	28	0	0.5308	4	24.6	0.00	6.87
110	Shelf	28	1.75	0.5316	4	24.6	3.29	6.97

FDA-GCSL Wipe Survey
Data Reduction Spreadsheet
(105 A&B Scoping Survey)

Liquid Scintillation Counter Results
Beckman LS 6500 (S/N 7067666)
Run ID #BP1904302, Window 0-2000 keV
April 30, 2019

Sample ID	Sample Location	Background (cpm)	NCPM	Efficiency (3H)	Time (m)	MDA (dpm)	DPM/100cm^2	Uncertainty (95%CL)
1	105A - Floor	28	0	0.4957	4	26.3	0.00	7.36
2	Floor	28	0	0.5205	4	25.1	0.00	7.01
3	Floor	28	0.5	0.5371	4	24.3	0.93	6.82
4	Floor	28	0	0.53	4	24.6	0.00	6.88
5	Floor	28	0	0.4859	4	26.9	0.00	7.51
6	Floor	28	0	0.5319	4	24.5	0.00	6.86
7	Floor	28	2.25	0.535	4	24.4	4.21	6.95
8	Floor	28	0	0.4437	4	29.4	0.00	8.22
9	Floor	28	0	0.516	4	25.3	0.00	7.07
10	Floor	28	0	0.5284	4	24.7	0.00	6.90
11	Floor	28	2	0.5355	4	24.4	3.73	6.93
12	Floor	28	0	0.5415	4	24.1	0.00	6.74
13	Floor	28	0	0.5216	4	25.0	0.00	6.99
14	Floor	28	0.5	0.5339	4	24.4	0.94	6.86
15	Floor	28	0	0.5401	4	24.2	0.00	6.75
16	Floor	28	0	0.5232	4	24.9	0.00	6.97
17	Floor	28	2.75	0.5373	4	24.3	5.12	6.95
18	Floor	28	0	0.5355	4	24.4	0.00	6.81
19	Floor	28	0	0.5333	4	24.5	0.00	6.84
20	Floor	28	0	0.5381	4	24.3	0.00	6.78
21	Floor	28	0	0.5349	4	24.4	0.00	6.82
22	Floor	28	0	0.5346	4	24.4	0.00	6.82
23	Floor	28	0	0.524	4	24.9	0.00	6.96
24	Floor	28	0	0.5336	4	24.5	0.00	6.84
25	Floor	28	0	0.5284	4	24.7	0.00	6.90
26	Wall A	28	0	0.5191	4	25.1	0.00	7.03
27	Wall A	28	0	0.5406	4	24.1	0.00	6.75

FDA-GCSL Wipe Survey
Data Reduction Spreadsheet
(105 A&B Scoping Survey)

Liquid Scintillation Counter Results
Beckman LS 6500 (S/N 7067666)
Run ID #BP1904302, Window 0-2000 keV
April 30, 2019

Sample ID	Sample Location	Background (cpm)	NCPM	Efficiency (3H)	Time (m)	MDA (dpm)	DPM/100cm^2	Uncertainty (95%CL)
28	Wall A	28	0	0.5377	4	24.3	0.00	6.78
29	Wall A	28	0	0.5287	4	24.7	0.00	6.90
30	Wall A	28	1.5	0.5407	4	24.1	2.77	6.84
31	Wall A	28	0	0.545	4	23.9	0.00	6.69
32	Wall A	28	0	0.5371	4	24.3	0.00	6.79
33	Wall B	28	0.25	0.537	4	24.3	0.47	6.81
34	Wall B	28	0	0.5208	4	25.1	0.00	7.00
35	Wall B	28	2	0.5382	4	24.3	3.72	6.90
36	Wall B	28	0	0.4866	4	26.8	0.00	7.50
37	Wall B	28	0	0.4683	4	27.9	0.00	7.79
38	Wall B	28	0	0.5161	4	25.3	0.00	7.07
39	Wall B	28	3.25	0.509	4	25.6	6.39	7.37
40	Wall C	28	0	0.5379	4	24.3	0.00	6.78
41	Wall C	28	0	0.543	4	24.0	0.00	6.72
42	Wall C	28	0	0.5403	4	24.2	0.00	6.75
43	Wall C	28	0	0.5448	4	24.0	0.00	6.70
44	Wall C	28	0	0.5302	4	24.6	0.00	6.88
45	Wall C	28	0	0.5388	4	24.2	0.00	6.77
46	Wall C	28	0	0.4896	4	26.7	0.00	7.45
47	Wall D	28	0	0.5003	4	26.1	0.00	7.29
48	Wall D	28	0	0.485	4	26.9	0.00	7.52
49	Wall D	28	0	0.4915	4	26.6	0.00	7.42
50	Wall D	28	0	0.5179	4	25.2	0.00	7.04
51	Wall D	28	0	0.523	4	25.0	0.00	6.98
52	Wall D	28	0	0.5039	4	25.9	0.00	7.24
53	Wall D	28	0	0.5314	4	24.6	0.00	6.87
54	Upper Walls / Ceiling	28	0	0.4925	4	26.5	0.00	7.41
55	Upper Walls / Ceiling	28	0	0.5361	4	24.3	0.00	6.80
56	Upper Walls / Ceiling	28	0	0.5275	4	24.7	0.00	6.92

FDA-GCSL Wipe Survey
Data Reduction Spreadsheet
(105 A&B Scoping Survey)

Liquid Scintillation Counter Results
Beckman LS 6500 (S/N 7067666)
Run ID #BP1904302, Window 0-2000 keV
April 30, 2019

Sample ID	Sample Location	Background (cpm)	NCPM	Efficiency (3H)	Time (m)	MDA (dpm)	DPM/100cm^2	Uncertainty (95%CL)
57	Upper Walls / Ceiling	28	0	0.5172	4	25.2	0.00	7.05
58	Upper Walls / Ceiling	28	0	0.5145	4	25.4	0.00	7.09
59	Wall A Benchtop	28	0	0.5197	4	25.1	0.00	7.02
60	Benchtop	28	0	0.4765	4	27.4	0.00	7.66
61	Benchtop	28	0	0.5098	4	25.6	0.00	7.16
62	Benchtop	28	4.25	0.5233	4	24.9	8.12	7.23
63	Benchtop	28	0	0.4964	4	26.3	0.00	7.35
64	Benchtop	28	1.5	0.506	4	25.8	2.96	7.31
65	Drawers	28	0	0.5032	4	25.9	0.00	7.25
66	Drawers	28	0	0.5092	4	25.6	0.00	7.16
67	Drawers	28	0	0.4977	4	26.2	0.00	7.33
68	Drawers	28	0	0.4921	4	26.5	0.00	7.41
69	Drawers	28	0	0.5068	4	25.8	0.00	7.20
70	Drawers	28	0	0.4563	4	28.6	0.00	7.99
71	Shelves	28	0	0.4989	4	26.2	0.00	7.31
72	Shelves	28	2	0.4955	4	26.3	4.04	7.49
73	Shelves	28	1.75	0.5076	4	25.7	3.45	7.30
74	Wall B Benchtop	28	0	0.508	4	25.7	0.00	7.18
75	Benchtop	28	0	0.4922	4	26.5	0.00	7.41
76	Benchtop	28	0	0.5295	4	24.7	0.00	6.89
77	Benchtop	28	1.5	0.4896	4	26.7	3.06	7.55
78	Benchtop	28	0	0.5218	4	25.0	0.00	6.99
79	Benchtop	28	0	0.5232	4	24.9	0.00	6.97
80	Benchtop	28	0	0.5333	4	24.5	0.00	6.84
81	Drawers	28	0	0.5034	4	25.9	0.00	7.25
82	Drawers	28	0	0.5036	4	25.9	0.00	7.24
83	Drawers	28	0	0.4764	4	27.4	0.00	7.66
84	Drawers	28	0	0.5102	4	25.6	0.00	7.15
85	Drawers	28	0	0.4497	4	29.0	0.00	8.11

FDA-GCSL Wipe Survey
Data Reduction Spreadsheet
(105 A&B Scoping Survey)

Liquid Scintillation Counter Results
Beckman LS 6500 (S/N 7067666)
Run ID #BP1904302, Window 0-2000 keV
April 30, 2019

Sample ID	Sample Location	Background (cpm)	NCPM	Efficiency (3H)	Time (m)	MDA (dpm)	DPM/100cm^2	Uncertainty (95%CL)
86	Drawers	28	0	0.4923	4	26.5	0.00	7.41
87	Drawers	28	0	0.4363	4	29.9	0.00	8.36
88	Sink	28	0	0.4317	4	30.2	0.00	8.45
89	Sink drain	28	0	0.4522	4	28.9	0.00	8.07
90	Wall C Benchtop	28	2.25	0.4445	4	29.4	5.06	8.37
91	Benchtop	28	0	0.4722	4	27.6	0.00	7.73
92	Benchtop	28	0	0.4976	4	26.2	0.00	7.33
93	Drawers	28	0	0.4917	4	26.5	0.00	7.42
94	Drawers	28	5	0.5098	4	25.6	9.81	7.47
95	Drawers	28	1.75	0.5018	4	26.0	3.49	7.38
96	Shelves	28	0	0.5182	4	25.2	0.00	7.04
97	Shelves	28	0	0.4744	4	27.5	0.00	7.69
98	Shelves	28	0	0.4959	4	26.3	0.00	7.36
99	Hood	28	0	0.4913	4	26.6	0.00	7.43
100	Hood	28	0	0.504	4	25.9	0.00	7.24
101	Hood	28	0	0.494	4	26.4	0.00	7.38
102	Hood	28	0	0.5028	4	26.0	0.00	7.26
103	Hood	28	0	0.4907	4	26.6	0.00	7.43
104	105B Floor	28	0	0.4711	4	27.7	0.00	7.74
105	Floor	28	0	0.4625	4	28.2	0.00	7.89
106	Floor	28	0	0.4873	4	26.8	0.00	7.49
107	Floor	28	0	0.4865	4	26.8	0.00	7.50
108	Floor	28	0	0.481	4	27.1	0.00	7.58
109	Floor	28	0	0.5223	4	25.0	0.00	6.98
110	Wall A	28	0	0.4936	4	26.4	0.00	7.39
111	Wall A	28	0	0.5154	4	25.3	0.00	7.08
112	Wall A	28	0	0.5182	4	25.2	0.00	7.04
113	Wall A	28	0	0.5107	4	25.6	0.00	7.14
114	Wall B	28	0	0.4842	4	27.0	0.00	7.53

FDA-GCSL Wipe Survey
Data Reduction Spreadsheet
(105 A&B Scoping Survey)

Liquid Scintillation Counter Results
Beckman LS 6500 (S/N 7067666)
Run ID #BP1904302, Window 0-2000 keV
April 30, 2019

Sample ID	Sample Location	Background (cpm)	NCPM	Efficiency (3H)	Time (m)	MDA (dpm)	DPM/100cm^2	Uncertainty (95%CL)
115	Wall B	28	0	0.4864	4	26.8	0.00	7.50
116	Wall B	28	0	0.438	4	29.8	0.00	8.33
117	Wall C	28	0	0.4572	4	28.5	0.00	7.98
118	Wall C	28	0	0.4856	4	26.9	0.00	7.51
119	Wall C	28	0	0.473	4	27.6	0.00	7.71
120	Wall C	28	0.25	0.4984	4	26.2	0.50	7.34
121	Wall D	28	0	0.4897	4	26.7	0.00	7.45
122	Wall D	28	0	0.4784	4	27.3	0.00	7.63
123	Wall D	28	2.5	0.4986	4	26.2	5.01	7.48
124	Upper Walls / Ceiling	28	0	0.4922	4	26.5	0.00	7.41
125	Upper Walls / Ceiling	28	0	0.5054	4	25.8	0.00	7.22
126	Wall C Benchtop	28	0	0.4944	4	26.4	0.00	7.38
127	Benchtop	28	0	0.4792	4	27.2	0.00	7.61
128	Benchtop	28	0	0.5026	4	26.0	0.00	7.26
129	Benchtop	28	0	0.5171	4	25.2	0.00	7.05
130	Drawers	28	0	0.4881	4	26.7	0.00	7.47
131	Drawers	28	0	0.5082	4	25.7	0.00	7.18
132	Drawers	28	0	0.4601	4	28.4	0.00	7.93
133	Shelves	28	0	0.5194	4	25.1	0.00	7.02
134	Shelves	28	0	0.5392	4	24.2	0.00	6.77
135	Shelves	28	0	0.5397	4	24.2	0.00	6.76
136	Shelves	28	0	0.5314	4	24.6	0.00	6.87
137	LSC	28	0.25	0.5036	4	25.9	0.50	7.26
138	LSC	28	0	0.5062	4	25.8	0.00	7.21
139	LSC	28	0.5	0.5121	4	25.5	0.98	7.16
140	Shielding	28	0	0.5441	4	24.0	0.00	6.70
141	Shielding	28	1	0.5247	4	24.9	1.91	7.01
142	Shielding	28	0	0.5324	4	24.5	0.00	6.85
143	Shielding	28	0	0.5408	4	24.1	0.00	6.75

FDA-GCSL Wipe Survey
Data Reduction Spreadsheet
(105 A&B Scoping Survey)

Liquid Scintillation Counter Results
Beckman LS 6500 (S/N 7067666)
Run ID #BP1904302, Window 0-2000 keV
April 30, 2019

Sample ID	Sample Location	Background (cpm)	NCPM	Efficiency (3H)	Time (m)	MDA (dpm)	DPM/100cm^2	Uncertainty (95%CL)
144	Shielding	28	0	0.5317	4	24.5	0.00	6.86
145	Shielding	28	0	0.47	4	27.8	0.00	7.76
146	Shielding	28	0	0.4847	4	26.9	0.00	7.53

FDA-GCSL Wipe Survey
Data Reduction Spreadsheet
(107 A&B Scoping Survey)

Liquid Scintillation Counter Results
Beckman LS 6500 (S/N 7067666)
Run ID #BP1905031, Window 0-2000 keV
May 3, 2019

Sample ID	Sample Location	Background (cpm)	NCPM	Efficiency (3H)	Time (m)	MDA (dpm)	DPM/100cm^2	Uncertainty (95%CL)
1	107A - Floor	28	0	0.5364	4	24.3	0.00	6.80
2	Floor	28	0	0.5328	4	24.5	0.00	6.85
3	Floor	28	0	0.5301	4	24.6	0.00	6.88
4	Floor	28	0	0.5347	4	24.4	0.00	6.82
5	Floor	28	0	0.5342	4	24.4	0.00	6.83
6	Floor	28	0	0.5358	4	24.4	0.00	6.81
7	Floor	28	0	0.5377	4	24.3	0.00	6.78
8	Floor	28	0	0.5315	4	24.6	0.00	6.86
9	Floor	28	0	0.5011	4	26.0	0.00	7.28
10	Floor	28	1	0.521	4	25.1	1.92	7.06
11	Floor	28	0	0.5389	4	24.2	0.00	6.77
12	Floor	28	1.75	0.5395	4	24.2	3.24	6.87
13	Floor	28	0	0.5031	4	25.9	0.00	7.25
14	Floor	28	0	0.4964	4	26.3	0.00	7.35
15	Floor	28	1.75	0.5322	4	24.5	3.29	6.96
16	Floor	28	0	0.5171	4	25.2	0.00	7.05
17	Floor	28	3.5	0.5399	4	24.2	6.48	6.96
18	Floor	28	0	0.5082	4	25.7	0.00	7.18
19	Floor	28	0	0.5271	4	24.8	0.00	6.92
20	Floor	28	0	0.5333	4	24.5	0.00	6.84
21	Floor	28	0	0.5368	4	24.3	0.00	6.80
22	Floor	28	0	0.5088	4	25.7	0.00	7.17
23	Floor	28	2	0.5089	4	25.6	3.93	7.30
24	Floor	28	0	0.5011	4	26.0	0.00	7.28
25	Floor	28	0	0.5412	4	24.1	0.00	6.74
26	Wall A	28	0.5	0.5313	4	24.6	0.94	6.90
27	Wall A	28	0	0.531	4	24.6	0.00	6.87
28	Wall A	28	0	0.5213	4	25.0	0.00	7.00
29	Wall A	28	1.5	0.5444	4	24.0	2.76	6.79
30	Wall A	28	0	0.5425	4	24.1	0.00	6.72

FDA-GCSL Wipe Survey
Data Reduction Spreadsheet
(107 A&B Scoping Survey)

Liquid Scintillation Counter Results
Beckman LS 6500 (S/N 7067666)
Run ID #BP1905031, Window 0-2000 keV
May 3, 2019

Sample ID	Sample Location	Background (cpm)	NCPM	Efficiency (3H)	Time (m)	MDA (dpm)	DPM/100cm^2	Uncertainty (95%CL)
31	Wall A	28	0	0.5495	4	23.8	0.00	6.64
32	Wall A	28	0	0.5292	4	24.7	0.00	6.89
33	Wall B	28	0	0.5379	4	24.3	0.00	6.78
34	Wall B	28	0.25	0.5423	4	24.1	0.46	6.74
35	Wall B	28	0	0.5356	4	24.4	0.00	6.81
36	Wall B	28	0.75	0.5286	4	24.7	1.42	6.95
37	Wall B	28	3.5	0.5213	4	25.0	6.71	7.21
38	Wall B	28	0	0.5316	4	24.6	0.00	6.86
39	Wall B	28	0	0.5315	4	24.6	0.00	6.86
40	Wall C	28	0.25	0.5255	4	24.8	0.48	6.96
41	Wall C	28	0	0.5369	4	24.3	0.00	6.79
42	Wall C	28	0	0.5361	4	24.3	0.00	6.80
43	Wall C	28	0	0.5277	4	24.7	0.00	6.91
44	Wall C	28	0.5	0.5395	4	24.2	0.93	6.79
45	Wall C	28	0	0.5292	4	24.7	0.00	6.89
46	Wall C	28	0	0.5456	4	23.9	0.00	6.69
47	Wall D	28	0.25	0.5381	4	24.3	0.46	6.79
48	Wall D	28	0	0.5151	4	25.3	0.00	7.08
49	Wall D	28	0	0.5357	4	24.4	0.00	6.81
50	Wall D	28	0	0.5297	4	24.6	0.00	6.89
51	Wall D	28	0	0.5356	4	24.4	0.00	6.81
52	Wall D	28	0	0.5372	4	24.3	0.00	6.79
53	Wall D	28	3.25	0.544	4	24.0	5.97	6.90
54	Upper Walls / Ceiling	28	1.25	0.5459	4	23.9	2.29	6.76
55	Upper Walls / Ceiling	28	0	0.5372	4	24.3	0.00	6.79
56	Upper Walls / Ceiling	28	0	0.5352	4	24.4	0.00	6.82
57	Upper Walls / Ceiling	28	0	0.5406	4	24.1	0.00	6.75
58	Upper Walls / Ceiling	28	0.75	0.5256	4	24.8	1.43	6.99
59	Wall A Benchtop	28	0	0.542	4	24.1	0.00	6.73
60	Benchtop	28	4.5	0.5414	4	24.1	8.31	7.00
61	Benchtop	28	0.5	0.5402	4	24.2	0.93	6.78
62	Benchtop	28	0	0.5412	4	24.1	0.00	6.74

FDA-GCSL Wipe Survey
Data Reduction Spreadsheet
(107 A&B Scoping Survey)

Liquid Scintillation Counter Results
Beckman LS 6500 (S/N 7067666)
Run ID #BP1905031, Window 0-2000 keV
May 3, 2019

Sample ID	Sample Location	Background (cpm)	NCPM	Efficiency (3H)	Time (m)	MDA (dpm)	DPM/100cm^2	Uncertainty (95%CL)
63	Benchtop	28	0	0.5464	4	23.9	0.00	6.68
64	Drawers	28	5.25	0.549	4	23.8	9.56	6.95
65	Drawers	28	0	0.5298	4	24.6	0.00	6.89
66	Drawers	28	2	0.5176	4	25.2	3.86	7.17
67	Drawers	28	0	0.5048	4	25.9	0.00	7.23
68	Drawers	28	0	0.5335	4	24.5	0.00	6.84
69	Shelves	28	0	0.5369	4	24.3	0.00	6.79
70	Shelves	28	0	0.5415	4	24.1	0.00	6.74
71	Shelves	28	0	0.5346	4	24.4	0.00	6.82
72	Hood	28	0	0.5431	4	24.0	0.00	6.72
73	Hood	28	0	0.5377	4	24.3	0.00	6.78
74	Hood	28	0	0.541	4	24.1	0.00	6.74
75	Hood	28	0	0.5244	4	24.9	0.00	6.96
76	Hood	28	0	0.5303	4	24.6	0.00	6.88
77	Wall B Benchtop	28	0	0.5365	4	24.3	0.00	6.80
78	Benchtop	28	0	0.5339	4	24.4	0.00	6.83
79	Benchtop	28	0	0.5359	4	24.4	0.00	6.81
80	Benchtop	28	0	0.5183	4	25.2	0.00	7.04
81	Benchtop	28	0	0.5379	4	24.3	0.00	6.78
82	Drawers	28	2.25	0.5333	4	24.5	4.22	6.98
83	Drawers	28	0	0.5445	4	24.0	0.00	6.70
84	Drawers	28	0	0.5324	4	24.5	0.00	6.85
85	Drawers	28	2	0.4802	4	27.2	4.16	7.73
86	Drawers	28	0	0.5378	4	24.3	0.00	6.78
87	Sink	28	1.5	0.5355	4	24.4	2.80	6.90
88	Sink drain	28	1	0.5082	4	25.7	1.97	7.24
89	Wall C Hood	28	0	0.5271	4	24.8	0.00	6.92
90	Wall C Hood	28	0	0.5206	4	25.1	0.00	7.01
91	Wall C Hood	28	0	0.5387	4	24.2	0.00	6.77
92	Wall C Hood	28	0	0.5448	4	24.0	0.00	6.70
93	Wall C Hood	28	1.75	0.5392	4	24.2	3.25	6.87
94	Wall D Benchtop	28	1	0.5417	4	24.1	1.85	6.79

FDA-GCSL Wipe Survey
Data Reduction Spreadsheet
(107 A&B Scoping Survey)

Liquid Scintillation Counter Results
Beckman LS 6500 (S/N 7067666)
Run ID #BP1905031, Window 0-2000 keV
May 3, 2019

Sample ID	Sample Location	Background (cpm)	NCPM	Efficiency (3H)	Time (m)	MDA (dpm)	DPM/100cm^2	Uncertainty (95%CL)
95	Benchtop	28	0	0.542	4	24.1	0.00	6.73
96	Benchtop	28	0	0.537	4	24.3	0.00	6.79
97	Benchtop	28	1.75	0.5314	4	24.6	3.29	6.97
98	Benchtop	28	0	0.541	4	24.1	0.00	6.74
99	Benchtop	28	5	0.5396	4	24.2	9.27	7.06
100	Benchtop	28	0	0.5432	4	24.0	0.00	6.72
101	Benchtop	28	1.5	0.5372	4	24.3	2.79	6.88
102	Benchtop	28	0	0.5349	4	24.4	0.00	6.82
103	Benchtop	28	0	0.5104	4	25.6	0.00	7.15
104	Benchtop	28	2.75	0.5416	4	24.1	5.08	6.90
105	Drawers	28	0	0.5375	4	24.3	0.00	6.79
106	Drawers	28	0	0.5353	4	24.4	0.00	6.82
107	Drawers	28	0.75	0.5311	4	24.6	1.41	6.91
108	Drawers	28	0	0.53	4	24.6	0.00	6.88
109	Drawers	28	0.5	0.5265	4	24.8	0.95	6.96
110	Drawers	28	4.5	0.5341	4	24.4	8.43	7.10
111	Drawers	28	0	0.5391	4	24.2	0.00	6.77
112	Drawers	28	0	0.5404	4	24.2	0.00	6.75
113	Drawers	28	0	0.5395	4	24.2	0.00	6.76
114	Drawers	28	0	0.5476	4	23.8	0.00	6.66
115	Shelves	28	4.75	0.5374	4	24.3	8.84	7.07
116	Shelves	28	0	0.5384	4	24.2	0.00	6.78
117	Shelves	28	0	0.5019	4	26.0	0.00	7.27
118	Shelves	28	0	0.5291	4	24.7	0.00	6.89
119	Shelves	28	3	0.5183	4	25.2	5.79	7.22
120	Sink	28	0	0.4987	4	26.2	0.00	7.32
121	Sink drain	28	2.25	0.4933	4	26.5	4.56	7.54
122	107B - Floor	28	0	0.5119	4	25.5	0.00	7.13
123	Floor	28	0	0.5205	4	25.1	0.00	7.01
124	Floor	28	0	0.54	4	24.2	0.00	6.76
125	Floor	28	0.75	0.5376	4	24.3	1.40	6.83
126	Floor	28	0	0.5331	4	24.5	0.00	6.84

FDA-GCSL Wipe Survey
Data Reduction Spreadsheet
(107 A&B Scoping Survey)

Liquid Scintillation Counter Results
Beckman LS 6500 (S/N 7067666)
Run ID #BP1905031, Window 0-2000 keV
May 3, 2019

Sample ID	Sample Location	Background (cpm)	NCPM	Efficiency (3H)	Time (m)	MDA (dpm)	DPM/100cm^2	Uncertainty (95%CL)
127	Floor	28	0.25	0.532	4	24.5	0.47	6.87
128	Floor	28	0	0.5177	4	25.2	0.00	7.05
129	Floor	28	0	0.5381	4	24.3	0.00	6.78
130	Wall A	28	0	0.5189	4	25.2	0.00	6.88
131	Wall A	28	0	0.5301	4	24.6	0.00	6.88
132	Wall A	28	1.25	0.5353	4	24.4	2.34	6.89
133	Wall A	28	0	0.5194	4	25.1	0.00	7.02
134	Wall B	28	1.25	0.5124	4	25.5	2.44	7.20
135	Wall B	28	0.25	0.518	4	25.2	0.48	7.06
136	Wall B	28	0	0.5182	4	25.2	0.00	7.04
137	Wall B	28	1	0.5142	4	25.4	1.94	7.16
138	Wall C	28	0	0.5208	4	25.1	0.00	7.00
139	Wall C	28	0	0.5247	4	24.9	0.00	6.95
140	Wall C	28	0	0.5349	4	24.4	0.00	6.82
141	Wall C	28	0	0.528	4	24.7	0.00	6.91
142	Wall D	28	0	0.5172	4	25.2	0.00	7.05
143	Wall D	28	0	0.5149	4	25.4	0.00	7.09
144	Wall D	28	0	0.5304	4	24.6	0.00	6.88
145	Wall D	28	0	0.5252	4	24.9	0.00	6.95
146	Upper Walls / Ceiling	28	0	0.5413	4	24.1	0.00	6.74
147	Upper Walls / Ceiling	28	0	0.5312	4	24.6	0.00	6.87
148	Wall A Benchtop	28	0.5	0.5365	4	24.3	0.93	6.83
149	Benchtop	28	0	0.5378	4	24.3	0.00	6.78
150	Benchtop	28	0	0.5284	4	24.7	0.00	6.90
151	Drawers	28	4.5	0.544	4	24.0	8.27	6.97
152	Drawers	28	1.75	0.5022	4	26.0	3.48	7.38
153	Drawers	28	0	0.532	4	24.5	0.00	6.86
154	Shelves	28	0	0.5085	4	25.7	0.00	7.17
155	Shelves	28	0	0.5357	4	24.4	0.00	6.81
156	Shelves	28	0	0.531	4	24.6	0.00	6.87
157	Wall C Benchtop	28	0	0.5426	4	24.1	0.00	6.72
158	Benchtop	28	4.5	0.5411	4	24.1	8.32	7.01

FDA-GCSL Wipe Survey
Data Reduction Spreadsheet
(107 A&B Scoping Survey)

Liquid Scintillation Counter Results
Beckman LS 6500 (S/N 7067666)
Run ID #BP1905031, Window 0-2000 keV
May 3, 2019

Sample ID	Sample Location	Background (cpm)	NCPM	Efficiency (3H)	Time (m)	MDA (dpm)	DPM/100cm^2	Uncertainty (95%CL)
159	Drawers	28	1.5	0.5363	4	24.3	2.80	6.89
160	Drawers	28	0	0.4736	4	27.6	0.00	7.70

FDA-GCSL Wipe Survey
Data Reduction Spreadsheet
(108 Scoping Survey)

Liquid Scintillation Counter Results
Beckman LS 6500 (S/N 7067666)
Run ID #BP1904303, Window 0-2000 keV
April 30, 2019

Sample ID	Sample Location	Background (cpm)	NCPM	Efficiency (3H)	Time (m)	MDA (dpm)	DPM/100cm²	Uncertainty (95%CL)
1	Floor	28	0	0.5268	4	24.8	0.00	6.93
2	Floor	28	0	0.4903	4	26.6	0.00	7.44
3	Floor	28	0	0.5435	4	24.0	0.00	6.71
4	Floor	28	0	0.4993	4	26.1	0.00	7.31
5	Floor	28	0	0.5146	4	25.4	0.00	7.09
6	Floor	28	0	0.543	4	24.0	0.00	6.72
7	Floor	28	0	0.5426	4	24.1	0.00	6.72
8	Floor	28	0	0.5405	4	24.1	0.00	6.75
9	Floor	28	0	0.5454	4	23.9	0.00	6.69
10	Floor	28	0	0.5383	4	24.2	0.00	6.78
11	Floor	28	0	0.5375	4	24.3	0.00	6.79
12	Floor	28	0	0.5431	4	24.0	0.00	6.72
13	Floor	28	0	0.5172	4	25.2	0.00	7.05
14	Floor	28	0	0.5083	4	25.7	0.00	7.18
15	Wall A	28	0	0.5349	4	24.4	0.00	6.82
16	Wall A	28	5.25	0.5262	4	24.8	9.98	7.25
17	Wall A	28	0	0.5408	4	24.1	0.00	6.75
18	Wall A	28	3.5	0.5387	4	24.2	6.50	6.98
19	Wall A	28	0	0.538	4	24.3	0.00	6.78
20	Wall A	28	0	0.5456	4	23.9	0.00	6.69
21	Wall A	28	0	0.5499	4	23.7	0.00	6.63
22	Wall B	28	0	0.5356	4	24.4	0.00	6.81
23	Wall B	28	0	0.5365	4	24.3	0.00	6.80
24	Wall B	28	0	0.4944	4	26.4	0.00	7.38
25	Wall B	28	0	0.5346	4	24.4	0.00	6.82
26	Wall C	28	0	0.5347	4	24.4	0.00	6.82
27	Wall C	28	0	0.5377	4	24.3	0.00	6.78

FDA-GCSL Wipe Survey
Data Reduction Spreadsheet
(108 Scoping Survey)

Liquid Scintillation Counter Results
Beckman LS 6500 (S/N 7067666)
Run ID #BP1904303, Window 0-2000 keV
April 30, 2019

Sample ID	Sample Location	Background (cpm)	NCPM	Efficiency (3H)	Time (m)	MDA (dpm)	DPM/100cm^2	Uncertainty (95%CL)
28	Wall C	28	0	0.5439	4	24.0	0.00	6.71
29	Wall C	28	0	0.5423	4	24.1	0.00	6.73
30	Wall C	28	0	0.5288	4	24.7	0.00	6.90
31	Wall C	28	0.75	0.5208	4	25.1	1.44	7.05
32	Wall C	28	0	0.5291	4	24.7	0.00	6.89
33	Wall D	28	1.75	0.5117	4	25.5	3.42	7.24
34	Wall D	28	3	0.5192	4	25.1	5.78	7.21
35	Wall D	28	0.75	0.5464	4	23.9	1.37	6.72
36	Wall D	28	0	0.5427	4	24.1	0.00	6.72
37	Upper Walls/Ceiling	28	0	0.5316	4	24.6	0.00	6.86
38	Upper Walls/Ceiling	28	0	0.5503	4	23.7	0.00	6.63
39	Upper Walls/Ceiling	28	0	0.5461	4	23.9	0.00	6.68
40	Wall A - Benchtop	28	0	0.5445	4	24.0	0.00	6.70
41	Benchtop	28	2	0.5484	4	23.8	3.65	6.77
42	Benchtop	28	0	0.5353	4	24.4	0.00	6.82
43	Benchtop	28	0	0.5353	4	24.4	0.00	6.82
44	Benchtop	28	0	0.5489	4	23.8	0.00	6.65
45	Drawers	28	1	0.5186	4	25.2	1.93	7.10
46	Drawers	28	1.25	0.5467	4	23.9	2.29	6.75
47	Drawers	28	0	0.5418	4	24.1	0.00	6.73
48	Drawers	28	0	0.551	4	23.7	0.00	6.62
49	Drawers	28	0	0.5395	4	24.2	0.00	6.76
50	Shelves	28	0	0.5278	4	24.7	0.00	6.91
51	Shelves	28	0	0.5432	4	24.0	0.00	6.72
52	Shelves	28	2	0.5415	4	24.1	3.69	6.86
53	Wall B - Benchtop	28	0	0.5157	4	25.3	0.00	7.07
54	Benchtop	28	0	0.5205	4	25.1	0.00	7.01
55	Benchtop	28	0	0.5423	4	24.1	0.00	6.73
56	Drawers	28	0	0.4924	4	26.5	0.00	7.41

FDA-GCSL Wipe Survey
Data Reduction Spreadsheet
(108 Scoping Survey)

Liquid Scintillation Counter Results
Beckman LS 6500 (S/N 7067666)
Run ID #BP1904303, Window 0-2000 keV
April 30, 2019

Sample ID	Sample Location	Background (cpm)	NCPM	Efficiency (3H)	Time (m)	MDA (dpm)	DPM/100cm^2	Uncertainty (95%CL)
57	Drawers	28	0.25	0.523	4	25.0	0.48	6.99
58	Drawers	28	0	0.5139	4	25.4	0.00	7.10
59	Wall C - Benchtop	28	0	0.5368	4	24.3	0.00	6.80
60	Benchtop	28	0	0.5405	4	24.1	0.00	6.75
61	Benchtop	28	1.5	0.5425	4	24.1	2.76	6.81
62	Benchtop	28	3.75	0.5453	4	23.9	6.88	6.91
63	Benchtop	28	0.5	0.5483	4	23.8	0.91	6.68
64	Drawers	28	0	0.5364	4	24.3	0.00	6.80
65	Drawers	28	0	0.5384	4	24.2	0.00	6.78
66	Drawers	28	0	0.5166	4	25.3	0.00	7.06
67	Drawers	28	0	0.5075	4	25.7	0.00	7.19
68	Shelves	28	0	0.5407	4	24.1	0.00	6.75
69	Shelves	28	0	0.5166	4	25.3	0.00	7.06
70	Shelves	28	0	0.4602	4	28.4	0.00	7.93
71	Shelves	28	0	0.533	4	24.5	0.00	6.84
72	Sink	28	0	0.5534	4	23.6	0.00	6.59
73	Sink drain	28	0	0.5135	4	25.4	0.00	7.10

FDA-GCSL Wipe Survey
Data Reduction Spreadsheet
(109 Scoping Survey)

Liquid Scintillation Counter Results
Beckman LS 6500 (S/N 7067666)
Run ID #BP1905012, Window 0-2000 keV
May 1, 2019

Sample ID	Sample Location	Background (cpm)	NCPM	Efficiency (3H)	Time (m)	MDA	DPM/100cm^2	Uncertainty (95%CL)
1	Floor	28	0	0.5222	4	25.0	0.0	6.99
2	Floor	28	0	0.5392	4	24.2	0.0	6.77
3	Floor	28	0	0.5303	4	24.6	0.0	6.88
4	Floor	28	0	0.5376	4	24.3	0.0	6.79
5	Floor	28	1.25	0.5405	4	24.1	2.3	6.82
6	Wall A	28	0	0.5273	4	24.8	0.0	6.92
7	Wall A	28	0	0.5343	4	24.4	0.0	6.83
8	Wall B	28	0	0.5315	4	24.6	0.0	6.86
9	Wall B	28	0	0.5355	4	24.4	0.0	6.81
10	Wall B	28	0	0.5174	4	25.2	0.0	7.05
11	Wall B	28	0	0.5446	4	24.0	0.0	6.70
12	Wall B	28	0	0.5246	4	24.9	0.0	6.95
13	Wall C	28	0	0.5382	4	24.3	0.0	6.78
14	Wall C	28	0	0.5288	4	24.7	0.0	6.90
15	Wall D	28	0.25	0.5426	4	24.1	0.5	6.74
16	Wall D	28	1.25	0.5501	4	23.7	2.3	6.71
17	Wall D	28	0	0.5417	4	24.1	0.0	6.73
18	Wall D	28	0	0.5262	4	24.8	0.0	6.93
19	Wall D	28	1.75	0.5482	4	23.8	3.2	6.76
20	Upper walls / Ceiling	28	0	0.5391	4	24.2	0.0	6.77
21	Shelves	28	0	0.5321	4	24.5	0.0	6.86
22	Shelves	28	0	0.5287	4	24.7	0.0	6.90

FDA-GCSL Wipe Survey
Data Reduction Spreadsheet
(110 Scoping Survey)

Liquid Scintillation Counter Results
Beckman LS 6500 (S/N 7067666)
Run ID #BP1904293, Window 0-2000 keV
April 29, 2019

Sample ID	Sample Location	Background (cpm)	NCPM	Efficiency (3H)	Time (m)	MDA (dpm)	DPM/100cm²	Uncertainty (95%CL)
1	Floor	28	0.25	0.5157	4	25.3	0.48	7.09
2	Floor	28	0	0.5037	4	25.9	0.00	7.24
3	Floor	28	0	0.4915	4	26.6	0.00	7.42
4	Floor	28	0	0.5032	4	25.9	0.00	7.25
5	Floor	28	0	0.4822	4	27.1	0.00	7.57
6	Floor	28	0	0.494	4	26.4	0.00	7.38
7	Floor	28	0	0.4472	4	29.2	0.00	8.16
8	Floor	28	0	0.4422	4	29.5	0.00	8.25
9	Floor	28	0	0.4953	4	26.4	0.00	7.37
10	Floor	28	0	0.4619	4	28.3	0.00	7.90
11	Floor	28	0	0.4074	4	32.0	0.00	8.95
12	Floor	28	0	0.4515	4	28.9	0.00	8.08
13	Floor	28	2	0.468	4	27.9	4.27	7.93
14	Floor	28	0	0.4117	4	31.7	0.00	8.86
15	Wall A	28	0	0.4437	4	29.4	0.00	8.22
16	Wall A	28	0	0.436	4	29.9	0.00	8.37
17	Wall A	28	0	0.4515	4	28.9	0.00	8.08
18	Wall A	28	0	0.4629	4	28.2	0.00	7.88
19	Wall A	28	0.5	0.4593	4	28.4	1.09	7.98
20	Wall A	28	0	0.4412	4	29.6	0.00	8.27
21	Wall A	28	0	0.4135	4	31.6	0.00	8.82
22	Wall B	28	0	0.4081	4	32.0	0.00	8.94
23	Wall B	28	0	0.4167	4	31.3	0.00	8.75
24	Wall B	28	0	0.4235	4	30.8	0.00	8.61
25	Wall B	28	0	0.4572	4	28.5	0.00	7.98
26	Wall C	28	0	0.4523	4	28.9	0.00	8.07
27	Wall C	28	0.25	0.456	4	28.6	0.55	8.02
28	Wall C	28	0	0.4575	4	28.5	0.00	7.97
29	Wall C	28	0	0.4348	4	30.0	0.00	8.39
30	Wall C	28	0	0.4731	4	27.6	0.00	7.71

FDA-GCSL Wipe Survey
Data Reduction Spreadsheet
(110 Scoping Survey)

Liquid Scintillation Counter Results
Beckman LS 6500 (S/N 7067666)
Run ID #BP1904293, Window 0-2000 keV
April 29, 2019

Sample ID	Sample Location	Background (cpm)	NCPM	Efficiency (3H)	Time (m)	MDA (dpm)	DPM/100cm^2	Uncertainty (95%CL)
31	Wall C	28	0	0.4495	4	29.0	0.00	8.12
32	Wall C	28	0	0.4663	4	28.0	0.00	7.82
33	Wall D	28	0	0.4857	4	26.9	0.00	7.51
34	Wall D	28	0	0.4616	4	28.3	0.00	7.90
35	Wall D	28	0	0.5164	4	25.3	0.00	7.06
36	Wall D	28	0	0.4771	4	27.4	0.00	7.65
37	Upper Walls/Ceiling	28	0	0.4741	4	27.5	0.00	7.69
38	Upper Walls/Ceiling	28	0	0.4596	4	28.4	0.00	7.94
39	Upper Walls/Ceiling	28	0	0.4426	4	29.5	0.00	8.24
40	Wall A - Benchtop	28	0	0.4596	4	28.4	0.00	7.94
41	Benchtop	28	0	0.4242	4	30.8	0.00	8.60
42	Benchtop	28	0	0.4671	4	27.9	0.00	7.81
43	Benchtop	28	0	0.4763	4	27.4	0.00	7.66
44	Benchtop	28	0	0.4583	4	28.5	0.00	7.96
45	Drawers	28	0	0.4578	4	28.5	0.00	7.97
46	Drawers	28	0	0.4594	4	28.4	0.00	7.94
47	Drawers	28	0	0.4376	4	29.8	0.00	8.34
48	Drawers	28	0.25	0.4547	4	28.7	0.55	8.04
49	Drawers	28	0	0.4499	4	29.0	0.00	8.11
50	Shelves	28	0	0.4394	4	29.7	0.00	8.30
51	Shelves	28	0	0.429	4	30.4	0.00	8.50
52	Shelves	28	0	0.4707	4	27.7	0.00	7.75
53	Wall B - Benchtop	28	0	0.4777	4	27.3	0.00	7.64
54	Benchtop	28	0	0.4402	4	29.7	0.00	8.29
55	Benchtop	28	0.25	0.474	4	27.5	0.53	7.71
56	Drawers	28	0	0.4554	4	28.7	0.00	8.01
57	Drawers	28	0	0.4412	4	29.6	0.00	8.27
58	Drawers	28	0	0.4716	4	27.7	0.00	7.74
59	Wall C - Benchtop	28	0	0.4121	4	31.7	0.00	8.85
60	Benchtop	28	0	0.4621	4	28.2	0.00	7.89
61	Benchtop	28	1	0.4535	4	28.8	2.21	8.12
62	Benchtop	28	0	0.4249	4	30.7	0.00	8.59

FDA-GCSL Wipe Survey
Data Reduction Spreadsheet
(110 Scoping Survey)

Liquid Scintillation Counter Results
Beckman LS 6500 (S/N 7067666)
Run ID #BP1904293, Window 0-2000 keV
April 29, 2019

Sample ID	Sample Location	Background (cpm)	NCPM	Efficiency (3H)	Time (m)	MDA (dpm)	DPM/100cm^2	Uncertainty (95%CL)
63	Benchtop	28	2	0.4546	4	28.7	4.40	8.17
64	Drawers	28	0	0.4625	4	28.2	0.00	7.89
65	Drawers	28	0	0.4281	4	30.5	0.00	8.52
66	Drawers	28	0	0.4553	4	28.7	0.00	8.01
67	Drawers	28	0	0.4713	4	27.7	0.00	7.74
68	Shelves	28	0	0.4437	4	29.4	0.00	8.22
69	Shelves	28	0	0.4353	4	30.0	0.00	8.38
70	Shelves	28	0	0.4534	4	28.8	0.00	8.05
71	Shelves	28	0.25	0.4715	4	27.7	0.53	7.75
72	Sink	28	0	0.4717	4	27.7	0.00	7.73
73	Sink drain	28	0	0.4656	4	28.0	0.00	7.84

FDA-GCSL Wipe Survey
Data Reduction Spreadsheet
(111 Scoping Survey)

Liquid Scintillation Counter Results
Beckman LS 6500 (S/N 7067666)
Run ID #BP1905012, Window 0-2000 keV
May 1, 2019

Sample ID	Sample Location	Background (cpm)	NCPM	Efficiency (3H)	Time (m)	MDA	DPM/100cm^2	Uncertainty (95%CL)
1	Floor	28	0	0.5015	4	26.0	0.0	7.27
2	Floor	28	0	0.5269	4	24.8	0.0	6.92
3	Floor	28	0	0.516	4	25.3	0.0	7.07
4	Floor	28	0	0.5254	4	24.8	0.0	6.94
5	Floor	28	0	0.5295	4	24.7	0.0	6.89
6	Wall A	28	0	0.5329	4	24.5	0.0	6.85
7	Wall A	28	0	0.5261	4	24.8	0.0	6.93
8	Wall A	28	0	0.5357	4	24.4	0.0	6.81
9	Wall A	28	0	0.5413	4	24.1	0.0	6.74
10	Wall A	28	0.75	0.5331	4	24.5	1.4	6.89
11	Wall B	28	0	0.5443	4	24.0	0.0	6.70
12	Wall B	28	0	0.5218	4	25.0	0.0	6.99
13	Wall C	28	0	0.5271	4	24.8	0.0	6.92
14	Wall C	28	0	0.5437	4	24.0	0.0	6.71
15	Wall C	28	0	0.5393	4	24.2	0.0	6.76
16	Wall C	28	0	0.5427	4	24.1	0.0	6.72
17	Wall C	28	0	0.5466	4	23.9	0.0	6.67
18	Wall D	28	0	0.5181	4	25.2	0.0	7.04
19	Wall D	28	2.25	0.5379	4	24.3	4.2	6.92
20	Upper walls / Ceiling	28	0	0.5292	4	24.7	0.0	6.89
21	Shelves	28	0	0.4792	4	27.2	0.0	7.61
22	Shelves	28	0	0.5414	4	24.1	0.0	6.74
23	Shelves	28	0	0.5438	4	24.0	0.0	6.71
24	Shelves	28	0	0.5346	4	24.4	0.0	6.82

FDA-GCSL Wipe Survey
Data Reduction Spreadsheet
(112 Scoping Survey)

Liquid Scintillation Counter Results
Beckman LS 6500 (S/N 7067666)
Run ID #BP1905012, Window 0-2000 keV
May 1, 2019

Sample ID	Sample Location	Background (cpm)	NCPM	Efficiency (3H)	Time (m)	MDA	DPM/100cm^2	Uncertainty (95%CL)
1	Floor	28	0	0.4883	4	26.7	0.0	7.47
2	Floor	28	1	0.5226	4	25.0	1.9	7.04
3	Floor	28	0	0.5386	4	24.2	0.0	6.77
4	Floor	28	0	0.532	4	24.5	0.0	6.86
5	Floor	28	0	0.5275	4	24.7	0.0	6.92
6	Floor	28	0	0.5314	4	24.6	0.0	6.87
7	Wall A	28	0	0.5295	4	24.7	0.0	6.89
8	Wall A	28	0	0.5337	4	24.5	0.0	6.84
9	Wall A	28	0	0.546	4	23.9	0.0	6.68
10	Wall A	28	0	0.5389	4	24.2	0.0	6.77
11	Wall B	28	0	0.5247	4	24.9	0.0	6.95
12	Wall B	28	0	0.5399	4	24.2	0.0	6.76
13	Wall B	28	0	0.54	4	24.2	0.0	6.76
14	Wall C	28	0	0.5468	4	23.9	0.0	6.67
15	Wall C	28	0	0.5387	4	24.2	0.0	6.77
16	Wall C	28	0.5	0.5437	4	24.0	0.9	6.74
17	Wall C	28	0	0.5373	4	24.3	0.0	6.79
18	Wall D	28	0.75	0.5414	4	24.1	1.4	6.78
19	Wall D	28	0	0.5132	4	25.4	0.0	7.11
20	Wall D	28	0	0.4798	4	27.2	0.0	7.60
21	Upper walls / Ceiling	28	0	0.5366	4	24.3	0.0	6.80
22	Upper walls / Ceiling	28	0	0.5388	4	24.2	0.0	6.77
23	Shelves	28	0	0.5354	4	24.4	0.0	6.81
24	Shelves	28	0	0.5343	4	24.4	0.0	6.83
25	Shelves	28	1	0.5192	4	25.1	1.9	7.09

FDA-GCSL Wipe Survey
Data Reduction Spreadsheet
(113 Scoping Survey)

Liquid Scintillation Counter Results
Beckman LS 6500 (S/N 7067666)
Run ID #BP1905012, Window 0-2000 keV
May 1, 2019

Sample ID	Sample Location	Background (cpm)	NCPM	Efficiency (3H)	Time (m)	MDA	DPM/100cm^2	Uncertainty (95%CL)
1	Floor	28	3.5	0.5284	4	24.7	6.6	7.12
2	Floor	28	0	0.5191	4	25.1	0.0	7.03
3	Floor	28	1.25	0.5281	4	24.7	2.4	6.98
4	Floor	28	0	0.5341	4	24.4	0.0	6.83
5	Floor	28	0.5	0.4887	4	26.7	1.0	7.50
6	Wall A	28	0	0.5382	4	24.3	0.0	6.78
7	Wall A	28	0	0.5144	4	25.4	0.0	7.09
8	Wall A	28	0	0.5348	4	24.4	0.0	6.82
9	Wall A	28	4.25	0.5228	4	25.0	8.1	7.24
10	Wall A	28	0	0.5433	4	24.0	0.0	6.71
11	Wall B	28	0	0.5304	4	24.6	0.0	6.88
12	Wall B	28	1.25	0.5439	4	24.0	2.3	6.78
13	Wall C	28	0	0.5316	4	24.6	0.0	6.86
14	Wall C	28	0	0.5464	4	23.9	0.0	6.68
15	Wall C	28	0	0.5394	4	24.2	0.0	6.76
16	Wall C	28	2.5	0.5306	4	24.6	4.7	7.03
17	Wall C	28	0	0.5388	4	24.2	0.0	6.77
18	Wall D	28	0	0.5002	4	26.1	0.0	7.29
19	Wall D	28	0	0.5266	4	24.8	0.0	6.93
20	Upper walls / Ceiling	28	0	0.5147	4	25.4	0.0	7.09
21	Shelves	28	0	0.5058	4	25.8	0.0	7.21
22	Shelves	28	0	0.538	4	24.3	0.0	6.78

FDA-GCSL Wipe Survey
Data Reduction Spreadsheet
(116 Scoping Survey)

Liquid Scintillation Counter Results
Beckman LS 6500 (S/N 7067666)
Run ID #BP1904304, Window 0-2000 keV
April 30, 2019

Sample ID	Sample Location	Background (cpm)	NCPM	Efficiency (3H)	Time (m)	MDA (dpm)	DPM/100cm^2	Uncertainty (95%CL)
1	Floor	28	0	0.5241	4	24.9	0.00	6.96
2	Floor	28	0	0.5308	4	24.6	0.00	6.87
3	Floor	28	0	0.5181	4	25.2	0.00	7.04
4	Floor	28	0	0.5306	4	24.6	0.00	6.88
5	Floor	28	0	0.506	4	25.8	0.00	7.21
6	Floor	28	0	0.53	4	24.6	0.00	6.88
7	Floor	28	0	0.5216	4	25.0	0.00	6.99
8	Floor	28	0	0.5073	4	25.7	0.00	7.19
9	Floor	28	0	0.4888	4	26.7	0.00	7.46
10	Floor	28	0	0.453	4	28.8	0.00	8.05
11	Floor	28	0	0.5133	4	25.4	0.00	7.11
12	Floor	28	0	0.4796	4	27.2	0.00	7.61
13	Floor	28	0	0.5134	4	25.4	0.00	7.11
14	Floor	28	0	0.4736	4	27.6	0.00	7.70
15	Floor	28	0	0.5046	4	25.9	0.00	7.23
16	Floor	28	3.25	0.5313	4	24.6	6.12	7.06
17	Floor	28	0	0.5327	4	24.5	0.00	6.85
18	Floor	28	2.5	0.4788	4	27.3	5.22	7.79
19	Floor	28	0	0.542	4	24.1	0.00	6.73
20	Floor	28	2.25	0.5416	4	24.1	4.15	6.87
21	Floor	28	0	0.4994	4	26.1	0.00	7.30
22	Wall A	28	0	0.5344	4	24.4	0.00	6.83
23	Wall A	28	0	0.54	4	24.2	0.00	6.76
24	Wall A	28	0	0.5308	4	24.6	0.00	6.87
25	Wall A	28	0	0.5255	4	24.8	0.00	6.94
26	Wall A	28	0	0.5241	4	24.9	0.00	6.96
27	Wall A	28	0	0.542	4	24.1	0.00	6.73
28	Wall A	28	0.25	0.4895	4	26.7	0.51	7.47
29	Wall B	28	0	0.5472	4	23.9	0.00	6.67
30	Wall B	28	0	0.5428	4	24.0	0.00	6.72

FDA-GCSL Wipe Survey
Data Reduction Spreadsheet
(116 Scoping Survey)

Liquid Scintillation Counter Results
Beckman LS 6500 (S/N 7067666)
Run ID #BP1904304, Window 0-2000 keV
April 30, 2019

Sample ID	Sample Location	Background (cpm)	NCPM	Efficiency (3H)	Time (m)	MDA (dpm)	DPM/100cm^2	Uncertainty (95%CL)
31	Wall B	28	1	0.5477	4	23.8	1.83	6.72
32	Wall B	28	0	0.5377	4	24.3	0.00	6.78
33	Wall B	28	0	0.5134	4	25.4	0.00	7.11
34	Wall B	28	0	0.5447	4	24.0	0.00	6.70
35	Wall C	28	0	0.5234	4	24.9	0.00	6.97
36	Wall C	28	0	0.4673	4	27.9	0.00	7.81
37	Wall C	28	0	0.504	4	25.9	0.00	7.24
38	Wall C	28	0	0.5038	4	25.9	0.00	7.24
39	Wall C	28	0.25	0.4982	4	26.2	0.50	7.34
40	Wall C	28	0	0.486	4	26.9	0.00	7.51
41	Wall C	28	0	0.4857	4	26.9	0.00	7.51
42	Wall D	28	0	0.5229	4	25.0	0.00	6.98
43	Wall D	28	0.5	0.5035	4	25.9	0.99	7.28
44	Wall D	28	0	0.5151	4	25.3	0.00	7.08
45	Wall D	28	0	0.5198	4	25.1	0.00	7.02
46	Wall D	28	0	0.4759	4	27.4	0.00	7.67
47	Wall D	28	0	0.5112	4	25.5	0.00	7.14
48	Upper walls / Ceiling	28	0	0.4953	4	26.4	0.00	7.37
49	Upper walls / Ceiling	28	0	0.4646	4	28.1	0.00	7.85
50	Upper walls / Ceiling	28	0	0.5231	4	25.0	0.00	6.97
51	Upper walls / Ceiling	28	0	0.5312	4	24.6	0.00	6.87
52	Upper walls / Ceiling	28	0.75	0.4904	4	26.6	1.53	7.49

FDA-GCSL Wipe Survey
Data Reduction Spreadsheet
(118 Scoping Survey)

Liquid Scintillation Counter Results
Beckman LS 6500 (S/N 7067666)
Run ID #BP1905013, Window 0-2000 keV
May 1, 2019

Sample ID	Sample Location	Background (cpm)	NCPM	Efficiency (3H)	Time (m)	MDA (dpm)	DPM/100cm²	Uncertainty (95%CL)
1	Floor	28	0	0.5385	4	24.2	0.00	6.77
2	Floor	28	0	0.5411	4	24.1	0.00	6.74
3	Floor	28	0	0.5429	4	24.0	0.00	6.72
4	Floor	28	0	0.5428	4	24.0	0.00	6.72
5	Floor	28	0	0.5365	4	24.3	0.00	6.80
6	Floor	28	0	0.5385	4	24.2	0.00	6.77
7	Floor	28	0	0.5108	4	25.6	0.00	7.14
8	Floor	28	0	0.5154	4	25.3	0.00	7.08
9	Floor	28	0	0.5386	4	24.2	0.00	6.77
10	Floor	28	0	0.532	4	24.5	0.00	6.86
11	Floor	28	0	0.5366	4	24.3	0.00	6.80
12	Floor	28	0	0.5201	4	25.1	0.00	7.01
13	Floor	28	0	0.5121	4	25.5	0.00	7.12
14	Floor	28	2.75	0.5406	4	24.1	5.09	6.91
15	Floor	28	0	0.5345	4	24.4	0.00	6.83
16	Floor	28	4.75	0.5307	4	24.6	8.95	7.16
17	Floor	28	0	0.5236	4	24.9	0.00	6.97
18	Floor	28	0	0.5114	4	25.5	0.00	7.13
19	Floor	28	0.25	0.5051	4	25.8	0.49	7.24
20	Floor	28	0	0.5151	4	25.3	0.00	7.08
21	Floor	28	0	0.5355	4	24.4	0.00	6.81
22	Floor	28	0	0.5101	4	25.6	0.00	7.15
23	Floor	28	0	0.5303	4	24.6	0.00	6.88
24	Floor	28	0	0.5237	4	24.9	0.00	6.97
25	Floor	28	0	0.5219	4	25.0	0.00	6.99
26	Floor	28	0	0.5288	4	24.7	0.00	6.90
27	Floor	28	0	0.5263	4	24.8	0.00	6.93
28	Floor	28	3.25	0.5386	4	24.2	6.03	6.97
29	Floor	28	0.25	0.5277	4	24.7	0.47	6.93
30	Floor	28	0	0.5378	4	24.3	0.00	6.78

FDA-GCSL Wipe Survey
Data Reduction Spreadsheet
(118 Scoping Survey)

Liquid Scintillation Counter Results
Beckman LS 6500 (S/N 7067666)
Run ID #BP1905013, Window 0-2000 keV
May 1, 2019

Sample ID	Sample Location	Background (cpm)	NCPM	Efficiency (3H)	Time (m)	MDA (dpm)	DPM/100cm²	Uncertainty (95%CL)
31	Floor	28	0.5	0.5103	4	25.6	0.98	7.18
32	Floor	28	0	0.5267	4	24.8	0.00	6.93
33	Floor	28	0	0.5145	4	25.4	0.00	7.09
34	Floor	28	0	0.5304	4	24.6	0.00	6.88
35	Floor	28	0	0.5296	4	24.6	0.00	6.89
36	Floor	28	0	0.5399	4	24.2	0.00	6.76
37	Floor	28	0	0.5178	4	25.2	0.00	7.05
38	Floor	28	0	0.5254	4	24.8	0.00	6.94
39	Floor	28	0	0.5335	4	24.5	0.00	6.84
40	Floor	28	0	0.5349	4	24.4	0.00	6.82
41	Floor	28	0.75	0.5222	4	25.0	1.44	7.03
42	Floor	28	0	0.5286	4	24.7	0.00	6.90
43	Floor	28	0	0.53	4	24.6	0.00	6.88
44	Floor	28	0	0.5296	4	24.6	0.00	6.89
45	Floor	28	0	0.5345	4	24.4	0.00	6.83
46	Wall A	28	0	0.5396	4	24.2	0.00	6.76
47	Wall A	28	0	0.5154	4	25.3	0.00	7.08
48	Wall A	28	0	0.5218	4	25.0	0.00	6.99
49	Wall A	28	0	0.5237	4	24.9	0.00	6.97
50	Wall A	28	0	0.5212	4	25.0	0.00	7.00
51	Wall A	28	0	0.5382	4	24.3	0.00	6.78
52	Wall A	28	0	0.5297	4	24.6	0.00	6.89
53	Wall A	28	0	0.5388	4	24.2	0.00	6.77
54	Wall A	28	0	0.504	4	25.9	0.00	7.24
55	Wall B	28	0	0.5405	4	24.1	0.00	6.75
56	Wall B	28	0.25	0.5062	4	25.8	0.49	7.22
57	Wall B	28	0	0.5053	4	25.8	0.00	7.22
58	Wall B	28	2.5	0.5395	4	24.2	4.63	6.91
59	Wall B	28	0	0.5209	4	25.1	0.00	7.00
60	Wall B	28	0	0.5399	4	24.2	0.00	6.76
61	Wall B	28	3	0.5443	4	24.0	5.51	6.88
62	Wall B	28	0	0.5226	4	25.0	0.00	6.98

FDA-GCSL Wipe Survey
Data Reduction Spreadsheet
(118 Scoping Survey)

Liquid Scintillation Counter Results
Beckman LS 6500 (S/N 7067666)
Run ID #BP1905013, Window 0-2000 keV
May 1, 2019

Sample ID	Sample Location	Background (cpm)	NCPM	Efficiency (3H)	Time (m)	MDA (dpm)	DPM/100cm^2	Uncertainty (95%CL)
63	Wall B	28	0	0.5257	4	24.8	0.00	6.94
64	Wall B	28	0	0.5235	4	24.9	0.00	6.97
65	Wall C	28	1	0.5197	4	25.1	1.92	7.08
66	Wall C	28	0	0.5113	4	25.5	0.00	7.13
67	Wall C	28	0	0.52	4	25.1	0.00	7.02
68	Wall C	28	0	0.5315	4	24.6	0.00	6.86
69	Wall C	28	2	0.5176	4	25.2	3.86	7.17
70	Wall C	28	0.75	0.5317	4	24.5	1.41	6.91
71	Wall C	28	0	0.5221	4	25.0	0.00	6.99
72	Wall C	28	0	0.5343	4	24.4	0.00	6.83
73	Wall C	28	0	0.5338	4	24.5	0.00	6.83
74	Wall D	28	0	0.5354	4	24.4	0.00	6.81
75	Wall D	28	0	0.5259	4	24.8	0.00	6.94
76	Wall D	28	0	0.5165	4	25.3	0.00	7.06
77	Wall D	28	0	0.536	4	24.4	0.00	6.81
78	Wall D	28	0	0.5348	4	24.4	0.00	6.82
79	Wall D	28	0	0.5198	4	25.1	0.00	7.02
80	Wall D	28	0	0.5338	4	24.5	0.00	6.83
81	Wall D	28	4.5	0.5375	4	24.3	8.37	7.05
82	Wall D	28	0	0.5395	4	24.2	0.00	6.76
83	Wall D	28	0	0.5327	4	24.5	0.00	6.85
84	Upper walls / Ceiling	28	0	0.5137	4	25.4	0.00	7.10
85	Upper walls / Ceiling	28	0	0.5228	4	25.0	0.00	6.98
86	Upper walls / Ceiling	28	0	0.5335	4	24.5	0.00	6.84
87	Upper walls / Ceiling	28	0	0.5144	4	25.4	0.00	7.09
88	Upper walls / Ceiling	28	0	0.5042	4	25.9	0.00	7.24
89	Upper walls / Ceiling	28	0	0.5213	4	25.0	0.00	7.00
90	Upper walls / Ceiling	28	0	0.5328	4	24.5	0.00	6.85
91	Upper walls / Ceiling	28	0	0.5058	4	25.8	0.00	7.21
92	Upper walls / Ceiling	28	1	0.5345	4	24.4	1.87	6.89
93	Wall A Sink	28	0	0.501	4	26.1	0.00	7.28
94	Sink drain	28	0.5	0.5028	4	26.0	0.99	7.29

FDA-GCSL Wipe Survey
Data Reduction Spreadsheet
(118 Scoping Survey)

Liquid Scintillation Counter Results
Beckman LS 6500 (S/N 7067666)
Run ID #BP1905013, Window 0-2000 keV
May 1, 2019

Sample ID	Sample Location	Background (cpm)	NCPM	Efficiency (3H)	Time (m)	MDA (dpm)	DPM/100cm^2	Uncertainty (95%CL)
95	Tanks		0	0.5092	4		0.00	
96	Tanks	28	0	0.4968	4	26.3	0.00	7.34
97	Tanks	28	0.5	0.4853	4	26.9	1.03	7.55
98	Tanks	28	0	0.4989	4	26.2	0.00	7.31

FDA-GCSL Wipe Survey
Data Reduction Spreadsheet
(119 Scoping Survey)

Liquid Scintillation Counter Results
Beckman LS 6500 (S/N 7067666)
Run ID #BP1904305, Window 0-2000 keV
April 30, 2019

Sample ID	Sample Location	Background* (cpm)	NCPM	Efficiency (3H)	Time (m)	MDA (dpm)	DPM/100cm^2	Uncertainty (95%CL)
1	Floor	28	0	0.5309	4	24.6	0.00	6.87
2	Floor	28	3.5	0.5068	4	25.8	6.91	7.42
3	Floor	28	0	0.5374	4	24.3	0.00	6.79
4	Floor	28	0	0.5252	4	24.9	0.00	6.95
5	Floor	28	0	0.5368	4	24.3	0.00	6.80
6	Floor	28	0	0.5357	4	24.4	0.00	6.81
7	Floor	28	0	0.534	4	24.4	0.00	6.83
8	Floor	28	0	0.5236	4	24.9	0.00	6.97
9	Floor	28	0	0.5308	4	24.6	0.00	6.87
10	Floor	28	0.25	0.5351	4	24.4	0.47	6.83
11	Floor	28	0	0.5336	4	24.5	0.00	6.84
12	Floor	28	0	0.5416	4	24.1	0.00	6.74
13	Floor	28	0	0.5172	4	25.2	0.00	7.05
14	Floor	28	0	0.5315	4	24.6	0.00	6.86
15	Wall A	28	0	0.534	4	24.4	0.00	6.83
16	Wall A	28	0	0.5387	4	24.2	0.00	6.77
17	Wall A	28	0	0.5304	4	24.6	0.00	6.88
18	Wall A	28	0	0.5351	4	24.4	0.00	6.82
19	Wall A	28	1.75	0.5337	4	24.5	3.28	6.94
20	Wall A	28	0	0.5365	4	24.3	0.00	6.80
21	Wall A	28	1	0.5446	4	24.0	1.84	6.76
22	Wall A	28	0	0.5196	4	25.1	0.00	7.02
23	Wall A	28	0	0.5072	4	25.7	0.00	7.19
24	Wall B	28	0	0.5172	4	25.2	0.00	7.05
25	Wall B	28	1	0.514	4	25.4	1.95	7.16
26	Wall B	28	0	0.5157	4	25.3	0.00	7.07
27	Wall C	28	0	0.5096	4	25.6	0.00	7.16
28	Wall C	28	0	0.5337	4	24.5	0.00	6.84
29	Wall C	28	0	0.5083	4	25.7	0.00	7.18
30	Wall C	28	0	0.5171	4	25.2	0.00	7.05

FDA-GCSL Wipe Survey
Data Reduction Spreadsheet
(119 Scoping Survey)

Liquid Scintillation Counter Results
Beckman LS 6500 (S/N 7067666)
Run ID #BP1904305, Window 0-2000 keV
April 30, 2019

Sample ID	Sample Location	Background (cpm)	NCPM	Efficiency (3H)	Time (m)	MDA (dpm)	DPM/100cm²	Uncertainty (95%CL)
31	Wall C	28	0	0.4944	4	26.4	0.00	7.38
32	Wall C	28	0	0.5059	4	25.8	0.00	7.21
33	Wall C	28	0	0.5379	4	24.3	0.00	6.78
34	Wall C	28	0	0.5477	4	23.8	0.00	6.66
35	Wall C	28	0.25	0.4895	4	26.7	0.51	7.47
36	Wall D	28	0	0.5471	4	23.9	0.00	6.67
37	Wall D	28	0	0.542	4	24.1	0.00	6.73
38	Wall D	28	0	0.538	4	24.3	0.00	6.78
39	Upper Walls/Ceiling	28	0	0.524	4	24.9	0.00	6.96
40	Upper Walls/Ceiling	28	0	0.5099	4	25.6	0.00	7.15
41	Upper Walls/Ceiling	28	0	0.5378	4	24.3	0.00	6.78
42	Wall A - Benchtop	28	0	0.4895	4	26.7	0.00	7.45
43	Benchtop	28	0	0.5198	4	25.1	0.00	7.02
44	Benchtop	28	0	0.4789	4	27.3	0.00	7.62
45	Sink	28	0	0.5281	4	24.7	0.00	6.91
46	Sink	28	0	0.5303	4	24.6	0.00	6.88
47	Sink drain	28	0	0.5139	4	25.4	0.00	7.10
48	Sink drain	28	0	0.5108	4	25.6	0.00	7.14
49	Shelves	28	0	0.5275	4	24.7	0.00	6.92
50	Shelves	28	0	0.5169	4	25.3	0.00	7.06
51	Shelves	28	0	0.4742	4	27.5	0.00	7.69
52	Shelves	28	0	0.5145	4	25.4	0.00	7.09
53	Shelves	28	3.25	0.4629	4	28.2	7.02	8.11
54	Floor drain	28	0	0.5023	4	26.0	0.00	7.26
55	Floor drain	28	0	0.4798	4	27.2	0.00	7.60

FDA-GCSL Wipe Survey
Data Reduction Spreadsheet
(302 Scoping Survey)

Liquid Scintillation Counter Results
Beckman LS 6500 (S/N 7067666)
Run ID #BP1904295, Window 0-2000 keV
April 29, 2019

Sample ID	Sample Location	Background (cpm)	NCPM	Efficiency (3H)	Time (m)	MDA (dpm)	DPM/100cm^2	Uncertainty (95%CL)
1	Floor	28	0	0.5428	4	24.0	0.00	6.72
2	Floor	28	0	0.5442	4	24.0	0.00	6.70
3	Floor	28	0	0.5463	4	23.9	0.00	6.68
4	Floor	28	0	0.5501	4	23.7	0.00	6.63
5	Floor	28	1.75	0.5474	4	23.8	3.20	6.77
6	Wall A	28	0	0.5417	4	24.1	0.00	6.73
7	Wall A	28	0	0.5347	4	24.4	0.00	6.82
8	Wall A	28	0	0.5153	4	25.3	0.00	7.08
9	Wall B	28	1.5	0.4801	4	27.2	3.12	7.70
10	Wall B	28	0	0.5018	4	26.0	0.00	7.27
11	Wall B	28	0.5	0.5303	4	24.6	0.94	6.91
12	Wall C	28	0	0.5427	4	24.1	0.00	6.72
13	Wall C	28	0	0.5475	4	23.8	0.00	6.66
14	Wall C	28	0	0.5431	4	24.0	0.00	6.72
15	Wall D	28	1	0.5127	4	25.5	1.95	7.18
16	Wall D	28	0	0.5403	4	24.2	0.00	6.75
17	Wall D	28	0	0.5416	4	24.1	0.00	6.74
18	Upper walls / Ceiling	28	0	0.5097	4	25.6	0.00	7.16
19	Shelves	28	0.75	0.5378	4	24.3	1.39	6.83
20	Shelves	28	0	0.5427	4	24.1	0.00	6.72
21	Plexiglass	28	0	0.5472	4	23.9	0.00	6.67
22	Plexiglass	28	1	0.5477	4	23.8	1.83	6.72
23	Plexiglass	28	0	0.5313	4	24.6	0.00	6.87
24	Plexiglass	28	0.75	0.5373	4	24.3	1.40	6.84
25	Plexiglass	28	0	0.5406	4	24.1	0.00	6.75
26	Plexiglass	28	0	0.5351	4	24.4	0.00	6.82
27	Plexiglass	28	0	0.4637	4	28.1	0.00	7.87

FDA-GCSL Wipe Survey
Data Reduction Spreadsheet
(Hallways Scoping Survey)

Liquid Scintillation Counter Results
Beckman LS 6500 (S/N 7067666)
Run ID #BP1905023, Window 0-2000 keV
May 2, 2019

Sample ID	Sample Location	Background (cpm)	NCPM	Efficiency (3H)	Time (m)	MDA (dpm)	DPM/100cm^2	Uncertainty (95%CL)
1	Main Hall Floor	28	0	0.5332	4	24.5	0.00	6.84
2	Floor	28	0	0.5166	4	25.3	0.00	7.06
3	Floor	28	0	0.4797	4	27.2	0.00	7.60
4	Floor	28	7.75	0.5149	4	25.4	15.05	7.56
5	Floor	28	0	0.5326	4	24.5	0.00	6.85
6	Floor	28	0	0.5194	4	25.1	0.00	7.02
7	Floor	28	1.25	0.5233	4	24.9	2.39	7.05
8	Floor	28	0	0.5191	4	25.1	0.00	7.03
9	Floor	28	0	0.5337	4	24.5	0.00	6.84
10	Floor	28	0	0.5236	4	24.9	0.00	6.97
11	Floor	28	0	0.4864	4	26.8	0.00	7.50
12	Floor	28	0	0.5164	4	25.3	0.00	7.06
13	Floor	28	0	0.5222	4	25.0	0.00	6.99
14	Floor	28	0	0.5076	4	25.7	0.00	7.19
15	Floor	28	0.75	0.5361	4	24.3	1.40	6.85
16	Floor	28	0	0.5228	4	25.0	0.00	6.98
17	Floor	28	1	0.5318	4	24.5	1.88	6.92
18	Floor	28	0	0.5284	4	24.7	0.00	6.90
19	Floor	28	0	0.5359	4	24.4	0.00	6.81
20	Floor	28	0	0.494	4	26.4	0.00	7.38
21	Floor	28	0	0.5314	4	24.6	0.00	6.87
22	Floor	28	0	0.5179	4	25.2	0.00	7.04
23	Floor	28	2.75	0.5101	4	25.6	5.39	7.33
24	Floor	28	0	0.5129	4	25.4	0.00	7.11
25	Floor	28	0	0.5201	4	25.1	0.00	7.01
26	Floor	28	4	0.4941	4	26.4	8.10	7.64
27	Floor	28	0	0.5267	4	24.8	0.00	6.93
28	Floor	28	0	0.5326	4	24.5	0.00	6.85
29	Floor	28	0	0.5347	4	24.4	0.00	6.82
30	Floor	28	0	0.5267	4	24.8	0.00	6.93

FDA-GCSL Wipe Survey
Data Reduction Spreadsheet
(Hallways Scoping Survey)

Liquid Scintillation Counter Results
Beckman LS 6500 (S/N 7067666)
Run ID #BP1905023, Window 0-2000 keV
May 2, 2019

Sample ID	Sample Location	Background (cpm)	NCPM	Efficiency (3H)	Time (m)	MDA (dpm)	DPM/100cm^2	Uncertainty (95%CL)
31	Floor	28	0	0.5309	4	24.6	0.00	6.87
32	Floor	28	0	0.5266	4	24.8	0.00	6.93
33	Floor	28	0	0.5279	4	24.7	0.00	6.91
34	Floor	28	0	0.5038	4	25.9	0.00	7.24
35	Floor	28	3	0.5224	4	25.0	5.74	7.17
36	Floor	28	1.5	0.5204	4	25.1	2.88	7.10
37	Wall A	28	0	0.5254	4	24.8	0.00	6.94
38	Wall A	28	0	0.5213	4	25.0	0.00	7.00
39	Wall A	28	0	0.5311	4	24.6	0.00	6.87
40	Wall A	28	0	0.5289	4	24.7	0.00	6.90
41	Wall A	28	0	0.5244	4	24.9	0.00	6.96
42	Wall A	28	0	0.515	4	25.3	0.00	7.08
43	Wall A	28	0	0.5034	4	25.9	0.00	7.25
44	Wall A	28	0	0.5053	4	25.8	0.00	7.22
45	Wall A	28	0	0.518	4	25.2	0.00	7.04
46	Wall A	28	0	0.5277	4	24.7	0.00	6.91
47	Wall A	28	2	0.5319	4	24.5	3.76	6.98
48	Wall A	28	4.5	0.5057	4	25.8	8.90	7.50
49	Wall A	28	0	0.5354	4	24.4	0.00	6.81
50	Wall A	28	4.75	0.5363	4	24.3	8.86	7.09
51	Wall A	28	0	0.5181	4	25.2	0.00	7.04
52	Wall A	28	0	0.5397	4	24.2	0.00	6.76
53	Wall A	28	0	0.5075	4	25.7	0.00	7.19
54	Wall A	28	0	0.5414	4	24.1	0.00	6.74
55	Wall A	28	0	0.5443	4	24.0	0.00	6.70
56	Wall A	28	0	0.5469	4	23.9	0.00	6.67
57	Wall A	28	0	0.5311	4	24.6	0.00	6.87
58	Wall A	28	0	0.537	4	24.3	0.00	6.79
59	Wall A	28	0.75	0.507	4	25.7	1.48	7.24
60	Wall A	28	0	0.5344	4	24.4	0.00	6.83
61	Wall A	28	0	0.4844	4	26.9	0.00	7.53
62	Wall A	28	0	0.5395	4	24.2	0.00	6.76

FDA-GCSL Wipe Survey
Data Reduction Spreadsheet
(Hallways Scoping Survey)

Liquid Scintillation Counter Results
Beckman LS 6500 (S/N 7067666)
Run ID #BP1905023, Window 0-2000 keV
May 2, 2019

Sample ID	Sample Location	Background (cpm)	NCPM	Efficiency (3H)	Time (m)	MDA (dpm)	DPM/100cm^2	Uncertainty (95%CL)
63	Wall A	28	0	0.5336	4	24.5	0.00	6.84
64	Wall A	28	0	0.5291	4	24.7	0.00	6.89
65	Wall A	28	0.75	0.5475	4	23.8	1.37	6.71
66	Wall A	28	0	0.504	4	25.9	0.00	7.24
67	Wall A	28	0.25	0.5125	4	25.5	0.49	7.13
68	Wall A	28	3.25	0.5009	4	26.1	6.49	7.49
69	Wall A	28	0	0.5001	4	26.1	0.00	7.29
70	Wall A	28	3	0.4896	4	26.7	6.13	7.65
71	Wall A	28	0	0.5346	4	24.4	0.00	6.82
72	Wall A	28	0	0.5352	4	24.4	0.00	6.82
73	Wall B	28	0	0.5095	4	25.6	0.00	7.16
74	Wall B	28	0	0.5336	4	24.5	0.00	6.84
75	Wall C	28	0.25	0.5245	4	24.9	0.48	6.97
76	Wall C	28	0	0.5092	4	25.6	0.00	7.16
77	Wall C	28	1.75	0.5267	4	24.8	3.32	7.03
78	Wall C	28	0	0.5122	4	25.5	0.00	7.12
79	Wall C	28	1.5	0.5137	4	25.4	2.92	7.20
80	Wall C	28	0.75	0.5363	4	24.3	1.40	6.85
81	Wall C	28	0	0.5154	4	25.3	0.00	7.08
82	Wall C	28	0	0.5423	4	24.1	0.00	6.73
83	Wall C	28	0	0.5425	4	24.1	0.00	6.72
84	Wall C	28	0	0.5288	4	24.7	0.00	6.90
85	Wall C	28	0	0.5323	4	24.5	0.00	6.85
86	Wall C	28	0.75	0.5338	4	24.5	1.41	6.88
87	Wall C	28	0	0.5298	4	24.6	0.00	6.89
88	Wall C	28	0	0.5411	4	24.1	0.00	6.74
89	Wall C	28	0	0.538	4	24.3	0.00	6.78
90	Wall C	28	0	0.5094	4	25.6	0.00	7.16
91	Wall C	28	0	0.5379	4	24.3	0.00	6.78
92	Wall C	28	0	0.5381	4	24.3	0.00	6.78
93	Wall C	28	0	0.5297	4	24.6	0.00	6.89
94	Wall C	28	0	0.5459	4	23.9	0.00	6.68

FDA-GCSL Wipe Survey
Data Reduction Spreadsheet
(Hallways Scoping Survey)

Liquid Scintillation Counter Results
Beckman LS 6500 (S/N 7067666)
Run ID #BP1905023, Window 0-2000 keV
May 2, 2019

Sample ID	Sample Location	Background (cpm)	NCPM	Efficiency (3H)	Time (m)	MDA (dpm)	DPM/100cm²	Uncertainty (95%CL)
95	Wall C	28	0	0.5407	4	24.1	0.00	6.75
96	Wall C	28	0	0.536	4	24.4	0.00	6.81
97	Wall C	28	0.25	0.5272	4	24.8	0.47	6.94
98	Wall C	28	2	0.5298	4	24.6	3.78	7.01
99	Wall C	28	0	0.5313	4	24.6	0.00	6.87
100	Wall C	28	0	0.5072	4	25.7	0.00	7.19
101	Wall C	28	0	0.5364	4	24.3	0.00	6.80
102	Wall C	28	0	0.5417	4	24.1	0.00	6.73
103	Wall C	28	0	0.5426	4	24.1	0.00	6.72
104	Wall C	28	0	0.5393	4	24.2	0.00	6.76
105	Wall C	28	0	0.5441	4	24.0	0.00	6.70
106	Wall C	28	0	0.5333	4	24.5	0.00	6.84
107	Wall C	28	1	0.5272	4	24.8	1.90	6.98
108	Wall C	28	0	0.529	4	24.7	0.00	6.90
109	Wall C	28	0	0.5222	4	25.0	0.00	6.99
110	Wall C	28	0	0.5305	4	24.6	0.00	6.88
111	Upper walls / Ceiling	28	0	0.515	4	25.3	0.00	7.08
112	Upper walls / Ceiling	28	0	0.5206	4	25.1	0.00	7.01
113	Upper walls / Ceiling	28	0.75	0.5293	4	24.7	1.42	6.94
114	Upper walls / Ceiling	28	0	0.5343	4	24.4	0.00	6.83
115	Upper walls / Ceiling	28	0.5	0.5204	4	25.1	0.96	7.04
116	Upper walls / Ceiling	28	3.5	0.54	4	24.2	6.48	6.96
117	Upper walls / Ceiling	28	0	0.5425	4	24.1	0.00	6.72
118	Upper walls / Ceiling	28	0.25	0.5458	4	23.9	0.46	6.70
119	Loading dock Hall Floor	28	0	0.4863	4	26.8	0.00	7.50
120	Floor	28	0	0.5298	4	24.6	0.00	6.89
121	Floor	28	0	0.5321	4	24.5	0.00	6.86
122	Floor	28	0	0.5109	4	25.5	0.00	7.14
123	Floor	28	0	0.5223	4	25.0	0.00	6.98
124	Floor	28	0	0.5075	4	25.7	0.00	7.19
125	Floor	28	0	0.5076	4	25.7	0.00	7.19
126	Floor	28	0	0.5346	4	24.4	0.00	6.82

FDA-GCSL Wipe Survey
Data Reduction Spreadsheet
(Hallways Scoping Survey)

Liquid Scintillation Counter Results
Beckman LS 6500 (S/N 7067666)
Run ID #BP1905023, Window 0-2000 keV
May 2, 2019

Sample ID	Sample Location	Background (cpm)	NCPM	Efficiency (3H)	Time (m)	MDA (dpm)	DPM/100cm^2	Uncertainty (95%CL)
127	Wall A	28	0	0.5319	4	24.5	0.00	6.86
128	Wall A	28	0	0.5329	4	24.5	0.00	6.85
129	Wall A	28	0	0.515	4	25.3	0.00	7.08
130	Wall A	28	0	0.5079	4	25.7	0.00	6.80
131	Wall A	28	0	0.534	4	24.4	0.00	6.83
132	Wall A	28	0	0.5241	4	24.9	0.00	6.96
133	Wall A	28	0	0.5092	4	25.6	0.00	7.16
134	Wall A	28	0	0.5437	4	24.0	0.00	6.71
135	Wall C	28	1.5	0.5427	4	24.1	2.76	6.81
136	Wall C	28	0	0.5244	4	24.9	0.00	6.96
137	Wall C	28	0	0.5481	4	23.8	0.00	6.66
138	Wall C	28	0	0.519	4	25.1	0.00	7.03
139	Wall C	28	0	0.5207	4	25.1	0.00	7.01
140	Wall C	28	0	0.5377	4	24.3	0.00	6.78
141	Wall C	28	0	0.516	4	25.3	0.00	7.07
142	Wall C	28	0	0.4969	4	26.3	0.00	7.34
143	Upper walls / Ceiling	28	0	0.5444	4	24.0	0.00	6.70
144	Upper walls / Ceiling	28	0	0.5233	4	24.9	0.00	6.97

Attachment Five

Instrument Data:
Quality Assurance
Calibration Certificates
MDC Calculations

Instrument Quality Assurance
Final Status Surveys

Scaler/Ratemeter	**Model:**	L-2221	**Serial #:**	86286	**Calibration Date:**	2/7/19	
Gas proportional	**Model:**	43-37	**Serial #:**	92501	**Mode:**	BETA	

Date	Technician / Reviewer	BKGD (CPM)		Acceptable Range (CPM)		Source ID	Isotope	Source Reading (CPM)		Acceptable Range (CPM)		RESULT
		x	$\bar{x}$	+20% / -20%	+3σ / -3σ			x	$\bar{x}$	+10% / -10%	+3σ / -3σ	
21-Mar	BP	966	930	1116	1020	1215-36-1	14C	12906	12834	14117	13074	PASS
	LB			744	840					11551	12594	
22-Mar	BP	969	930	1116	1020	1215-36-1	14C	12931	12834	14117	13074	PASS
	LB			744	840					11551	12594	
23-Mar	BP	934	930	1116	1020	1215-36-1	14C	12852	12834	14117	13074	PASS
	LB			744	840					11551	12594	

ENERGY*SOLUTIONS*

CALIBRATION CERTIFICATE

EnergySolutions Services, Inc.
1570 Bear Creek Road
Oak Ridge, TN 37830
Phone: (877) 462-4873
Email: ISFStaff@energysolutions.com

This Certificate will be accompanied by Calibration Charts or Readings where applicable

CUSTOMER INFORMATION		INSTRUMENT INFORMATION	
Customer Name: EnergySolutions Instrument Services		Manufacturer: Ludlum	
Address: 1570 Bear Creek Road, Oak Ridge, TN 37830		Model: 2221	Serial Number: 86286
Contact Name: Mike Pauli		Probe: N/A	Serial Number: N/A
Customer Purchase Order Number: N/A	Work Order Number: N/A	Calibration Method: Electronic	

INSTRUMENT CALIBRATION INFORMATION

Instrument Range	Calibration Standard Value (cpm)	Ratemeter Response (cpm) (± 10% of Calibration Values)		Calibration Standard Value (cpm)	Time Base (min)	Tolerances (Counts) ± 2%	Scaler Response (Counts)	
		As Found	As Left				As Found	As Left
X 1	100	100	100	1,000	0.1	98 - 102	99	99
X 1	250	250	250	1,000	0.2	196 - 204	199	199
X 1	400	400	400	1,000	0.5	490 - 510	497	497
X 10	1,000	1,000	1,000	1,000	1	980 - 1,020	994	994
X 10	2,500	2,500	2,500	1,000	2	1,960 – 2,040	1,989	1,989
X 10	4,000	3,950	3,950	1,000	5	4,900 – 5,100	4,973	4,973
X 100	10,000	10,000	10,000	1,000	10	9,800 – 10,200	9,945	9,945
X 100	25,000	25,000	25,000					
X 100	40,000	39,500	39,500					
X 1K	100,000	100,000	100,000	Calibrated in accordance with OEM Technical Manual				
X 1K	250,000	250,000	250,000					
X 1K	400,000	390,000	390,000					

STATEMENT OF CERTIFICATION

We Certify that the instrument listed above was calibrated and inspected prior to shipment and that it met all the Manufacturers published operating specifications. We further certify that our Calibration Measurements are traceable to the National Institute of Standards and Technology. (We are not responsible for damage incurred during shipment or use of this instrument).

Instrument Calibrated By: M. Pauli	Reviewed By: Jeff Mathison Date: 2/7/19
Calibration Date: 02/07/2019	* Calibration Due (6 mo.): 08/07/2019
	* Calibration Due (12 mo.): 02/07/2020

* Calibration due date is dependent on users regulatory requirements.

ENERGYSOLUTIONS

Model: 2221 Serial Number: 86286

M&TE					Environmental Conditions				
Volt Meter	Due Date:	08/27/2019	ID:	93950304	Temp/Press	Due Date:	03/23/2019	ID:	A070146
Pulser	Due Date:	05/15/2019	ID:	101500	Humidity	Due Date:	03/23/2019	ID:	A070146
					Temp: 20.4 °C	Pressure: 741 mmHg		Humidity: 48.8 %	

INSTRUMENT CALIBRATION INFORMATION

Special Test

Geotropism	Sat (✓) Unsat ( )	Hold	Sat (✓) Unsat ( )
BAT > 4.5V	Sat (✓) Unsat ( )	Volume Test	Sat (✓) Unsat ( )
Mechanical Zero	Sat (✓) Unsat ( )	Audio Divide	Sat (✓) Unsat ( )
Digital Zero	Sat (✓) Unsat ( )	Window Switch	Sat (✓) Unsat ( )
Count	Sat (✓) Unsat ( )	Lamp	Sat (✓) Unsat ( )
HV Adjust (50 – 2,400V)	Sat (✓) Unsat ( )		

High Voltage Calibration

Voltage	Tolerance (volts) ± 2%	As Found (volts)	As Left (volts)
400	392 - 408	399	399
1,000	980 - 1,020	1,001	1,001
1,500	1,470 - 1,530	1,502	1,502
1,900	1,862 - 1,938	1,907	1,907

Threshold/Gain Calibration (Desired Ratio 10 mV/100)

Threshold Setting	Pulser Input	As Found Ratio (mV/100)	Pulser Input	As Left Ratio (mV/100)	Window	Threshold Cutoff (mV)
100	9.6	9.6	9.6	9.6	100	18.6
200	19.6	9.8	19.6	9.8	200	28.4
300	29.7	9.9	29.7	9.9	300	38.3
400	39.5	9.9	39.5	9.9	400	48.5
500	49.5	9.9	49.5	9.9	N/A	N/A

Logmeter Scale Linearity Check

Input		±20% Tolerance	As Found	As Left
LOG	400	320 - 480	400	400
LOG	4,000	3,200 - 4,800	4,000	4,000
LOG	40,000	32,000 - 48,000	40,000	40,000
LOG	400,000	320,000 - 480,000	375,000	375,000

COMMENTS

Calibrated in accordance with OEM Technical Manual

Instrument Calibrated By: M. Powell	Reviewed By: [signature] Date: 2/7/19
Calibration Date: 02/07/2019	* Calibration Due (6 mo.): 08/07/2019
	* Calibration Due (12 mo.): 02/07/2020

* Calibration due date is dependent on users regulatory requirements.

ENERGY*SOLUTIONS*

CALIBRATION CERTIFICATE

Energy*Solutions* Instrument Services
1570 Bear Creek Road
Oak Ridge, TN 37830
Phone: (877) 462-4873
Email: ISFstaff@energysolutions.com

This Certificate will be accompanied by Calibration Charts or Readings where applicable

CUSTOMER INFORMATION		DETECTOR INFORMATION
Customer Name: Energy*Solutions* Instrument Services		Manufacturer: Ludlum
Address: 1570 Bear Creek Road Oak Ridge, TN 37830		Detector Model: 43-37
Contact Name: John Barncord		Serial Number: 092501
Customer Purchase Order Number: N/A	Work Order Number: 2669	Evaluation Method: Source

DETECTOR EFFICIENCY/RESPONSE/PRECISION INFORMATION

Source Nuclide: C^{14}	Serial Number: 010002	Activity: 260460dpm	2 Pi Emissions: 72660 /min	Certification Date: 12/14/99

Parameter	As Found	As Left	Precision Test	CPM
Count 1	38126	38126	Count 1 (Heel)	37869
Count 2	37612	37612	Count 2 (Center)	37815
Count 3	38268	38268	Count 3 (Toe)	37671
Count 4	37391	37391	Average	37785
Count 5	37362	37362	Tolerance	34006.5-41563.5 ±10%
Count 6	37881	37881	Pass/Fail	Pass
Average	37728.9	37728.9		
Background (CPM)	1211.8	1211.8		
Net Counts	36517	36517		
2pi Efficiency	50.26%	50.26%		
4pi Efficiency	14.02%	14.02%		

Low Sample Activity: Source #: N/A	High Sample Activity: Source #: N/A	Dead Time (DT): N/A	Calibration Constant (CC): N/A

SCALER INFORMATION			DETECTOR INFORMATION		
Model	Serial Number	Due Date	Background (cpm)	Operating Voltage	Threshold
2221	172019	8/8/19	1211.8	1800V	4mV (40 on display)
Detector Setup Report N/A			Barcode Report N/A		Voltage Plateau YES √ NO

COMMENTS

5 minute background performed | Efficiency performed on contact with 5Ft. cable | 1 layer mylar (0.4mg/cm2)

STATEMENT OF CERTIFICATION

We Certify that the detector listed above was evaluated for proper operation prior to shipment and that it met all the Manufacturers published operating specifications. We further certify that our Calibration Measurements are traceable to the National Institute of Standards and Technology. (We are not responsible for damage incurred during shipment or use of this detector).

Detector Certified By:	Reviewed By:	Date: 3/18/19
Certification Date: 3/18/19	*Certification Due (6mo): 9/18/19	
	* Certification Due (12mo): 3/18/20	

* Calibration due date is dependant on users regulatory requirements.

43-37 #092501

BACKGROUND

900	1
950	0
1000	0
1050	1
1100	4
1150	6
1200	10
1250	18
1300	13
1350	13
1400	13
1450	15
1500	24
1550	46
1600	115
1650	172
1700	313
1750	513
1800	969
1850	1201
1900	1273
1950	1533

SOURCE COUNT C-14 #010002 (260460 DPM)

900	0
950	0
1000	0
1050	1
1100	4
1150	7
1200	11
1250	13
1300	13
1350	10
1400	21
1450	16
1500	138
1550	2912
1600	11256
1650	19912
1700	27804
1750	32767
1800	35930
1850	36976
1900	37906
1950	43486

Minimum Detectable Concentrations (MDCs)
(NUREG 1507 Table 3.1, Strom & Stansbury, 1992)

Direct Monitoring

Matrix: **Floor, Vinyl**
Reference Area: Admin Hall

L2221 (SN 86286)
Probe: 43-37 (92501) E_{tot} = ^{14}C 2π Efficiency (50.26%) x Surface efficiency (25%)

MDC Static
Reports MDC in dpm/100cm^2

		ENTER:	
B_R	background, ambient (cpm)	B_R	554
t_b	background count time (minutes)	t_b	10
t_s	sample count time (minutes)	t_s	1
E_{tot}	total detector efficiency for radionuclide of interest	E_{tot}	0.125
A	detector probe area (cm^2)	A	584

t_s / t_b	0.1
	1.1
$B_R * t_s$ *calc	609.4
sqrt	24.686
* 3.29	81.217
plus 3	84.217
ts*Etot*A/100	0.73

MDC STATIC **115** dpm/100cm^2
Result < 50% DQO

MDC Scan
Reports MDC in dpm/100cm^2

		ENTER:		
d'	desired performance variable (1.38)	b_i	9.23	cps
b_i	background count during the residence interval	E_{tot}	0.125	
i	residence interval (seconds)	A	584	
p	surveyor efficiency (0.5)			
E_{tot}	total detector efficiency for radionuclide of interest			
A	detector probe area (cm^2)			

43-37

i 1 seconds at one probe width per second

60 / i	60.00
cps	9.23
sqrt	3.04
	182.32
* 1.38	251.60
sqrt(0.5)	0.71
* Etot	0.09
* 5.82	0.51

MDC SCAN **489** dpm/100cm^2

Minimum Detectable Concentrations (MDCs)
(NUREG 1507 Table 3.1, Strom & Stansbury, 1992)

Direct Monitoring

Matrix: **Cinderblock, interior**
Reference Area: Admin Hall

L2221 (SN 86286)
Probe: 43-37 (92501) E_{tot} = ^{14}C 2π Efficiency (50.26%) x Surface efficiency (25%)

MDC Static
Reports MDC in dpm/100cm^2

		ENTER:	
B_R	background, ambient (cpm)	B_R	554
t_b	background count time (minutes)	t_b	10
t_s	sample count time (minutes)	t_s	1
E_{tot}	total detector efficiency for radionuclide of interest	E_{tot}	0.125
A	detector probe area (cm^2)	A	584

t_s / t_b	0.1
	1.1
$B_R * t_s$ *calc	609.4
sqrt	24.686
* 3.29	81.217
plus 3	84.217
ts*Etot*A/100	0.73

MDC STATIC **115** dpm/100cm^2
Result < 50% DQO

MDC Scan
Reports MDC in dpm/100cm^2

		ENTER:		
d'	desired performance variable (1.38)	b_i	9.23	cps
b_i	background count during the residence interval	E_{tot}	0.125	
i	residence interval (seconds)	A	584	
p	surveyor efficiency (0.5)			
E_{tot}	total detector efficiency for radionuclide of interest			
A	detector probe area (cm^2)			

43-37

i 1 seconds at one probe width per second

60 / i	60.00
cps	9.23
sqrt	3.04
	182.32
* 1.38	251.60
sqrt(0.5)	0.71
* Etot	0.09
* 5.82	0.51

MDC SCAN **489** dpm/100cm^2

Minimum Detectable Concentrations (MDCs)
(NUREG 1507 Table 3.1, Strom & Stansbury, 1992)

Direct Monitoring

Matrix: **Ceramic tile**
Reference Area: 106

L2221 (SN 86286)
Probe: 43-37 (92501) E_{tot} = ^{14}C 2π Efficiency (50.26%) x Surface efficiency (25%)

MDC Static
Reports MDC in dpm/100cm^2

		ENTER:	
B_R	background, ambient (cpm)	B_R	2118
t_b	background count time (minutes)	t_b	10
t_s	sample count time (minutes)	t_s	1
E_{tot}	total detector efficiency for radionuclide of interest	E_{tot}	0.125
A	detector probe area (cm^2)	A	584

t_s / t_b	0.1
	1.1
$B_R * t_s *$calc	2329.8
sqrt	48.268
* 3.29	158.802
plus 3	161.802
ts*Etot*A/100	0.73

MDC STATIC **222** dpm/100cm^2
Result < 50% DQO

MDC Scan
Reports MDC in dpm/100cm^2

		ENTER:		
d'	desired performance variable (1.38)	b_i	35.30	cps
b_i	background count during the residence interval	E_{tot}	0.125	
i	residence interval (seconds)	A	584	
p	surveyor efficiency (0.5)			
E_{tot}	total detector efficiency for radionuclide of interest			
A	detector probe area (cm^2)			

43-37

i 1 seconds at one probe width per second

60 / i	60.00
cps	35.30
sqrt	5.94
	356.48
* 1.38	491.95
sqrt(0.5)	0.71
* Etot	0.09
* 5.82	0.51

MDC SCAN **956** dpm/100cm^2

Minimum Detectable Concentrations (MDCs)
(NUREG 1507 Table 3.1, Strom & Stansbury, 1992)

Direct Monitoring

Matrix: **Benchtop**
Reference Area: 106

L2221 (SN 86286)
Probe: 43-37 (92501) E_{tot} = ^{14}C 2π Efficiency (50.26%) x Surface efficiency (25%)

MDC Static
Reports MDC in dpm/100cm^2

			ENTER:	
B_R	background, ambient (cpm)		B_R	853
t_b	background count time (minutes)		t_b	10
t_s	sample count time (minutes)		t_s	1
E_{tot}	total detector efficiency for radionuclide of interest		E_{tot}	0.125
A	detector probe area (cm^2)		A	584
t_s / t_b		0.1		
		1.1		
$B_R * t_s$ *calc		938.3		
sqrt		30.6317		
* 3.29		100.778		
plus 3		103.778		
ts*Etot*A/100		0.73		

MDC STATIC **142** dpm/100cm^2
Result < 50% DQO

MDC Scan
Reports MDC in dpm/100cm^2

			ENTER:	
d'	desired performance variable (1.38)		b_i	14.22 cps
b_i	background count during the residence interval		E_{tot}	0.125
i	residence interval (seconds)		A	584
p	surveyor efficiency (0.5)			
E_{tot}	total detector efficiency for radionuclide of interest			
A	detector probe area (cm^2)			

43-37

i 1 seconds at one probe width per second

60 / i	60.00
cps	14.22
sqrt	3.77
	226.23
* 1.38	312.20
sqrt(0.5)	0.71
* Etot	0.09
* 5.82	0.51

MDC SCAN **607** dpm/100cm^2

Minimum Detectable Concentrations (MDCs)
(NUREG 1507 Table 3.1, Strom & Stansbury, 1992)

Direct Monitoring

Matrix: **Casework, metal**
Reference Area: 106

L2221 (SN 86286)
Probe: 43-37 (92501) E_{tot} = ^{14}C 2π Efficiency (50.26%) x Surface efficiency (25%)

MDC Static
Reports MDC in dpm/100cm²

			ENTER:	
B_R	background, ambient (cpm)		B_R	592
t_b	background count time (minutes)		t_b	10
t_s	sample count time (minutes)		t_s	1
E_{tot}	total detector efficiency for radionuclide of interest		E_{tot}	0.125
A	detector probe area (cm²)		A	584
t_s / t_b		0.1		
		1.1		
$B_R * t_s *$calc		651.2		
sqrt		25.5186		
* 3.29		83.9563		
plus 3		86.9563		
ts*Etot*A/100		0.73		

MDC STATIC **119** dpm/100cm²
Result < 50% DQO

MDC Scan
Reports MDC in dpm/100cm²

			ENTER:	
d'	desired performance variable (1.38)		b_i	9.87 cps
b_i	background count during the residence interval		E_{tot}	0.125
i	residence interval (seconds)		A	584
p	surveyor efficiency (0.5)			
E_{tot}	total detector efficiency for radionuclide of interest			
A	detector probe area (cm²)			
43-37				
i	1 seconds	at one probe width per second		
60 / i		60.00		
cps		9.87		
sqrt		3.14		
		188.47		
* 1.38		260.09		
sqrt(0.5)		0.71		
* Etot		0.09		
* 5.82		0.51		

MDC SCAN **506** dpm/100cm²

Minimum Detectable Concentrations (MDCs)
(NUREG 1507 Table 3.1, Strom & Stansbury, 1992)

Direct Monitoring

Matrix: **Cinderblock, exterior**
Reference Area: 100

L2221 (SN 86286)
Probe: 43-37 (92501) E_{tot} = ^{14}C 2π Efficiency (50.26%) x Surface efficiency (25%)

MDC Static
Reports MDC in dpm/100cm^2

		ENTER:	
B_R	background, ambient (cpm)	B_R	748
t_b	background count time (minutes)	t_b	10
t_s	sample count time (minutes)	t_s	1
E_{tot}	total detector efficiency for radionuclide of interest	E_{tot}	0.125
A	detector probe area (cm^2)	A	584

t_s / t_b	0.1
	1.1
$B_R * t_s$ *calc	822.8
sqrt	28.6845
* 3.29	94.372
plus 3	97.372
ts*Etot*A/100	0.73

MDC STATIC **133** dpm/100cm^2
Result < 50% DQO

MDC Scan
Reports MDC in dpm/100cm^2

		ENTER:		
d'	desired performance variable (1.38)	b_i	12.47	cps
b_i	background count during the residence interval	E_{tot}	0.125	
i	residence interval (seconds)	A	584	
p	surveyor efficiency (0.5)			
E_{tot}	total detector efficiency for radionuclide of interest			
A	detector probe area (cm^2)			

43-37

i 1 seconds at one probe width per second

60 / i	60.00
cps	12.47
sqrt	3.53
	211.85
* 1.38	292.35
sqrt(0.5)	0.71
* Etot	0.09
* 5.82	0.51

MDC SCAN **568** dpm/100cm^2

Minimum Detectable Concentrations (MDCs)
(NUREG 1507 Table 3.1, Strom & Stansbury, 1992)

Direct Monitoring

Matrix: **Floor, acrylic**
Reference Area: 120

L2221 (SN 86286)
Probe: 43-37 (92501) E_{tot} = ^{14}C 2π Efficiency (50.26%) x Surface efficiency (25%)

MDC Static
Reports MDC in dpm/100cm^2

		ENTER:	
B_R	background, ambient (cpm)	B_R	993
t_b	background count time (minutes)	t_b	10
t_s	sample count time (minutes)	t_s	1
E_{tot}	total detector efficiency for radionuclide of interest	E_{tot}	0.125
A	detector probe area (cm^2)	A	584

t_s / t_b	0.1
	1.1
$B_R * t_s$ *calc	1092.3
sqrt	33.05
* 3.29	108.734
plus 3	111.734
ts*Etot*A/100	0.73

MDC STATIC **153** dpm/100cm^2
Result < 50% DQO

MDC Scan
Reports MDC in dpm/100cm^2

		ENTER:	
d'	desired performance variable (1.38)	b_i	16.55 cps
b_i	background count during the residence interval	E_{tot}	0.125
i	residence interval (seconds)	A	584
p	surveyor efficiency (0.5)		
E_{tot}	total detector efficiency for radionuclide of interest		
A	detector probe area (cm^2)		

43-37

i 1 seconds at one probe width per second

60 / i	60.00
cps	16.55
sqrt	4.07
	244.09
* 1.38	336.84
sqrt(0.5)	0.71
* Etot	0.09
* 5.82	0.51

MDC SCAN **655** dpm/100cm^2

ENERGYSOLUTIONS
We're part of the solution

Tuesday, October 31, 2017

Charles Watts
CLYM Environmental Services/Frederick, MD
1539 Tilco Drive Suite 123
Frederick, MD 21704

Dear Mr. Watts:

The attached signed shipping manifest copies are your notice of receipt of the radioactive waste materials shipment specified on the manifest number below.

Manifest Number	Date Received
2432-171026-1	10/31/2017

Thank you for your business.

Sincerely,

Tammy D. Hall

Shipping and Receiving

cc: Manifest File
Shipping and Receiving file

ENERGYSOLUTIONS
We're part of the solution

Manifest Discrepancies

None

FORM 540 — Duratek, Inc. - Commercial Processing

UNIFORM LOW-LEVEL RADIOACTIVE WASTE MANIFEST
SHIPPING PAPER

1. EMERGENCY TELEPHONE NUMBER (Include Area Code): 800-424-9300
ORGANIZATION: CHEMTREC

2. IS THIS AN "EXCLUSIVE USE" SHIPMENT? ☐ YES ☑ NO

3. TOTAL NUMBER OF PACKAGES IDENTIFIED ON THIS MANIFEST ==>: 8

4. DOES EPA REGULATED WASTE REQUIRING A MANIFEST ACCOMPANY THIS SHIPMENT? ☐ YES ☑ NO
If "Yes," provide Manifest Number ==>
EPA MANIFEST NUMBER

5. SHIPPER – NAME AND FACILITY
Chm Env Svcs for Food and Drug Administration
Gulf Coast Seafood Lab
1 Iberville Drive
Dauphin Island, AL 36528

SHIPPER I.D. NUMBER: T-MD005-L17
☐ COLLECTOR ☐ PROCESSOR ☑ GENERATOR TYPE (Specify) G

USER PERMIT NUMBER: ALD981869712
SHIPMENT NUMBER: 171026
CONTACT: Kevin Calci
TELEPHONE NUMBER (Include Area Code): 251-466-8127

6. CARRIER – Name and Address
Tri State Motor Transit, Co.
PO Box 113
Joplin, MO 64802
Truck #: 175029
Trailer #: 70195
EPA I.D. NUMBER: MOD095038998
SHIPPING DATE: 10/26/2017
CONTACT: Twyla McDermott
TELEPHONE (Include Area Code): 800-553-5788
SIGNATURE – Authorized carrier acknowledging waste receipt: TSMT (8) 10-26-17
DATE

7. FORM 540 AND 540A — PAGE 1 OF 2 PAGE(S)
FORM 541 AND 541A — 2 PAGE(S)
FORM 542 AND 542A — None PAGE(S)
ADDITIONAL INFORMATION — None PAGE(S)

8. MANIFEST NUMBER (Use this number on all continuation pages): 171026-1

9. CONSIGNEE - Name and Facility
Duratek, Inc. - Commercial Processing
Bear Creek Operations
1560 Bear Creek Road
Oak Ridge, TN 37830
CONTACT: Shipping and Receiving
TELEPHONE (Include Area Code): 865-481-0222
SIGNATURE – Authorized consignee acknowledging waste receipt
DATE: 10/27/17 (10/31/17)

10. CERTIFICATION
This is to certify that the herein named materials are properly classified, described, packaged, marked, and labeled and are in proper condition for transportation according to the applicable regulations of the Department of Transportation. This also certifies that the materials are classified, packaged, marked, and labeled and are in proper condition for transportation and disposal as described in accordance with the requirements of 10 CFR Parts 20 and 61, or equivalent state regulations.
AUTHORIZED SIGNATURE | TITLE | DATE

11. U.S. DEPARTMENT OF TRANSPORTATION DESCRIPTION (including proper shipping name, hazard class, UN ID number, and any additional information)	12. DOT LABEL "RADIOACTIVE"	13. TRANSPORT INDEX	14. PHYSICAL AND CHEMICAL FORM	15. INDIVIDUAL RADIONUCLIDES	16. TOTAL PACKAGE ACTIVITY MBq	mCi	17. LSA/SCO CLASS	18. TOTAL WEIGHT OR VOLUME (Use appropriate units)	19. IDENTIFICATION NUMBER OF PACKAGE
UN2910, Radioactive material, excepted package-limited quantity of material, 7 Dry active waste and tissues for incineration	NA	NA	Solid Salts, proteins on paper, plastic, tissue	C-14 H-3	1.2377E+02	3.3450E+00	NA	100 LBS; 7.5 FT3	171026-1
UN2910, Radioactive material, excepted package-limited quantity of material, 7 Fire brick for compaction	NA	NA	Solid Oxide	Th-Nat	2.9600E-04	8.0000E-06	NA	500 LBS; 7.5 FT3	171026-2
UN2910, Radioactive material, excepted package-limited quantity of material, 7 Fire brick for compaction	NA	NA	Solid Oxide	Th-Nat	2.9600E-04	8.0000E-06	NA	500 LBS; 7.5 FT3	171026-3
UN2910, Radioactive material, excepted package-limited quantity of material, 7 Fire brick for compaction	NA	NA	Solid Oxide	Th-Nat	2.9600E-04	8.0000E-06	NA	500 LBS; 7.5 FT3	171026-4
UN2910, Radioactive material, excepted package-limited quantity of material, 7 Fire brick for compaction	NA	NA	Solid Oxide	Th-Nat	2.9600E-04	8.0000E-06	NA	500 LBS; 7.5 FT3	171026-5
UN2910, Radioactive material, excepted package-limited quantity of material, 7 Fire brick and dry active waste for compaction	NA	NA	Solid Oxide, salts on metal, glass	C-14 H-3 P-32 Th-Nat	3.6347E-01	1.0364E-02	NA	250 LBS; 7.5 FT3	171026-6

FOR CONSIGNEE USE ONLY

TENNESSEE "LICENSE FOR DELIVERY" NO _____

SOUTH CAROLINA TRANSPORT PERMIT NO _____

US ECOLOGY GENERATOR NO _____

US ECOLOGY PERMIT NO _____

20. GENERATOR CERTIFICATION STATEMENT

A) Radioactive Materials. Certification is hereby made to Duratek, Inc. that this shipment of low-level radioactive material/waste has been prepared in accordance with radioactive waste management program which has been approved by the Nuclear Regulatory Commission or an Agreement State regulatory agency and with the current revision of the Duratek Material Acceptance Criteria.

B) Hazardous Materials. Generator hereby certifies that this material does not contain a hazardous waste as defined in 40 CFR 261.

C) Date. Generator hereby represents and warrants that all data set forth in this (UNIFORM LOW-LEVEL RADIOACTIVE WASTE MANIFEST) are true and correct in all respects and in accordance with all applicable governmental laws, rules, regulations and Duratek, Inc. State of Tennessee Radioactive Material Licenses.

Kevin R. Calci (Print Name) — Signature — 10/27/17 (Date)

FORM 540 (10-98)

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LCROSS
175029
70195

2432/ T173778